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Financial System Performance and Economic Dynamics

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Financial System Performance and Economic Dynamics

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I. Introduction

The basic question that a theorist of economic dynamics is confronted with is the following: what constellation of forces drive economic system dynamics? The next question is whether the same set of forces drives economic growth, business cycles and dynamics of inequality (and poverty). If that be the case, then how should one build a theoretical framework which can be analyzed such that questions about growth, cycles and inequality are addressed together? So far, theorists have mostly treated these phenomena separately for the sake of analytical tractability and only in recent times has the concern arisen as to their inter-linkages and possibilities of their integrated analysis.

As I will suggest in this paper, the theory of finance plays a key role in answering these queries since finance facilitates inter-temporal trade under uncertainty, information costs and transaction costs which leads to capital accumulation via contracts, institutions and markets. Second, given incomplete markets for risk sharing, money and other financial assets partially integrate the budget constraints of an economic entity which increases the scope for welfare or value maximization under inter-temporal tradeoffs. Third, finance determines the allocation of risk through dynamic trading in financial markets and dynamic portfolio management by financial intermediaries. All of these factors create a rich and influential structure of financial markets, financial institutions and financial instruments. The inter-temporal issues faced due to the role of time, uncertainty and transaction costs lead to a reliance on the principles of finance and their refinements. A method of analyzing institutions and markets which are constrained by information costs, transaction costs and policy is developed. These theoretical refinements critically examine issues not only pertinent to economic growth, but also allow explorations in the theory of business cycles and answer many queries on the dynamics of inequality and poverty.

This paper considers the relation between financial system performance and economic dynamics. This is a research report on theory. A good theory learns from the past, lives the present and influences the future reasonably well, and that is my purpose here. The kind of theory that the book builds up is a dynamic theory of the economy where finance, in a broad sense as the analysis of inter-temporal trade, plays a big part (see Smith (1776), Ricardo (1846), Mill (1848), Marx (1867), Jevons (1884), Fisher (1930), Wicksell (1936), Pigou (1912), Marshall (1923), Hayek (1935), Hawtrey (1927), Keynes (1936), Hicks (1939), Samuelson (1947), Friedman (1956), Hahn (1965), Solow (1970), Tobin (1980), Gale (1983), Romer (1986), Lucas (1987), Dornbusch and Fischer (1987), Cooper and John (1988), Banerjee and Newman (1993), Piketty (1997), Allen and Gale (2000), Lucas (2003), Tirole (2006), Allen and Gale (2007), Altug and Labadie (2008), Mishkin (2010), Modigliani (2011) and Woodford (2016)).

The economic system consists of families which may consist of working members, firm entrepreneurs, bank entrepreneurs and politicians in and out of the government apparatus. The economic system consists of networks aiding transactions in goods and factor markets. Markets in goods and labour clear by rationing while markets for financial assets clear by price adjustments in general. Fiscal policy, monetary policy and regulation improve welfare.

The economic system performance is judged by analyzing aggregate welfare which is a weighted sum of utilities levels of different individuals over time (where low utility levels receive higher weights and future utilities are moderately discounted). Since literally summing up utilities of different individuals over time is operationally not possible, some criteria should be used to evaluate aggregate welfare. First, poverty should be tolerably low and diminishing. Second, asset and income distribution should not be too skewed. The third criterion is that per

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capita standard of living should be high, not fluctuating too much and rising adequately fast over time.

The financial system determines how much spending can be done through firms and households which affect aggregate demand. The financial system also affects aggregate supply by influencing spending on capital accumulation and R&D by firms. The performance of the financial system determines how efficiently funds can be raised when the representative firm expects a high, durable and growing demand for its products. The performance of the financial system in turn, is determined by efficiencies in risk taking, risk sharing and risk management and efficiencies in liquidity provision by financial intermediaries and financial markets. An efficient financial system aided by suitable policy (see Tinbergen (1952), Friedman (1956) and Auerbach and Kotlikoff (1995)), generates robust growth, relatively low degree of fluctuations and promotes reduction in economic inequality. The firm is the basic driver of economic dynamics since investment spending and R&D boost growth on the supply side and employment generation boosts growth on the demand side. Fluctuations in spending drive business cycles. Employment potential created and lower entry barriers for entrepreneurs and workers in the industries reduce inequality in the long run. I assume it is possible to talk about a representative firm in an approximate sense. Then it becomes clear how economic growth, business cycles and changes in asset and income distribution manifests. The firm hires production labour, R&D staff and management staff, and it buys capital goods and other goods from other firms producing them. Thus more is spent on wages and investment goods. This raises incomes of individuals and institutions and these entities further spend on other firms. Thus a demand externality mechanism creates a multiplier (in cohesion with the investment accelerator) to the initial surge in spending and depending on the nature of performance of the financial system, it permits rational expansion or contraction in economic activity most of the times (see Lucas (1987)) but warrant policy interventions at other times.

An important question which arises when one confronts aggregate economic data and panel data is essentially the following: what are the disturbances or shocks that hit an economy at any date and how are the shocks propagated or transmitted throughout the economy (see Frisch (1933))? It is easy to see that some shocks are real shocks like those affecting productivity (caused by an endemic or a pandemic or a resource constraint or affecting ease of factor market transactions), tastes and transaction and information cost parameters. Other types of shocks are nominal in nature and manifest through unanticipated money supply growth, changes in interest rates, debt defaults, unanticipated changes in fiscal policy parameters etc. The transmission mechanism can vary like an effect of a money shock taking place via changes in interest rates which in turn change investment spending, interest rate changes causing wealth effects and affecting consumer spending, technology shocks which changes the capital accumulation and employment plans of firms and so on.

II. The Financial System

a) *Finance in a Dynamic Economy*

Let me begin by defining a dynamic economy. A dynamic economy is one where different kinds of capital accumulation take place in different firms. By capital I mean physical capital, human resources and financial securities. By physical capital, I mean non-human produced means of production. By human resources I mean human capabilities of survival, production, saving, trading and consumption of individuals endowed with health and education services (see Sen (1985)). By financial securities, I refer to financial assets accumulated by financial intermediaries, households and firms which are claims within the economic system. These claims always cancel out in aggregate in the accounting sense except for outside money (currency in circulation), central bank bonds and government bonds (though some would not consider government bonds as net wealth). However, the distribution of the financial claims do not fully cancel in the contractual sense since there are always some debt defaults, bankruptcies and equity washouts and non-exercise of derivatives like options. The sequence of the financial claims generated as the combination of unrealized and realized claims in the contractual sense does matter for allocation properties of the dynamic economy. The government and central bank securities generated through objectives and budget constraints of governments and monetary authorities also matter.

Some may object to this definition of dynamic economy. Critics may argue that finance is just a veil even though a little complicated and mysterious veil. They can and do argue that the veil can be lifted by focusing on real variables in dynamic models insightfully. The critics of finance are satisfied with analysis of dynamic efficiency in the context of real growth models (see Azariadis (1993), Cass (1972), Burmeister (1980), Mas-Colell, Whinston and Green (1995) and Stokey and Lucas with Prescott (1989)). According to the critics, the fluctuations in aggregate activity like employment, income, wages and the real interest rates can be studied through the real business cycle models (see Brock and Mirman (1972), Kydland and Prescott (1982) and Lucas (1987)) and by dynamic stability analysis in real economic models (see Azariadis (1993)). Equity or fairness in distribution can be satisfactorily studied from social choice models without any financial parameters or variables (see Sen (1982)). According to the critics, finance is a theoretical nuisance in understanding dynamics because its use distorts

pure analysis and prevents reaching perfect conclusions.

I do not share the views of the critics. Finance would not have existed without a reason in our daily lives. Financial markets, financial institutions and financial innovations create value and that is why they exist and fetch positive prices. Monetary, banking and financial theorists of different schools have characterized this value generation process (see Fisher (1907), Keynes (1936), Patinkin (1965), Hahn (1984), Gale (1982), Freixas and Rochet (1997), Allen and Gale (1994) and Mishkin (2010)). One can also refer to the literature on risk sharing through financial innovations, the optimality of term structure of interest rates, dynamic portfolio theory, value maximizing financial structure, growth inducing financial asset accumulation, efficient nature of banking, value addition by financial intermediation, relative efficiency in fund management, optimal spanning under uncertainty, rational asset pricing, inter-temporal risk sharing through social security and bank reserves and informational efficiency of financial markets (see Eatwell, Milgate and Newman (1987), Huang and Litzenberger (1988), Allen and Gale (2000), Ross (2003), Duffie (2005) and Danthine and Donaldson (2005)).

However, the value generating process may display bubbles which creates financial as well as real instability, distort the allocative and informational efficiency of the growth process apart from creating inequitable redistribution of financial resources (see Geisst (1997), Michie (1999) and Hunter, Kaufman and Pomerleano ed. (2003)). Further, risky liquidity and credit management may create financial fragility and crises (see Allen and Gale (2007) and Bernanke and Gertler (1990)), and the general properties of financial market processes may be skewed for a long time over the time series and cross section leading to widening and persistent inequality (see Kuznets (1955), Stiglitz (1969), Greenwood and Jovanovic (1990) and Piketty (2014)).

There are three reasons why the dynamics of a financial system displays the undesirable properties described above. The first is “incomplete markets” or lack of full insurance in inter-temporal contracting and lending-borrowing programs over time. Many efficient projects cannot be undertaken due to incomplete markets and many inefficient projects get green signals. The second reason is “incomplete participation” or lack of ability to participate in important decision makings in institutions and lack of ability to play the financial markets game as a “privileged member”. This causes “outsiders” not to participate in the financial markets, which keeps the market thin and volatile and inequality increasing in nature. The third reason is “contracting related problems” which increases the possibility of pervasive coordination failures creating aggregate instability (see Cooper and John (1988)).

Due to these potential inefficiencies there lies a positive value of liberalizing, stabilizing, redistributive and regulatory policies which are also basically financial in nature. The monetary, fiscal and regulatory policies can to some extent improve upon some outcomes some of the times (see Keynes (1936), Samuelson (1958), Tobin (1965), Diamond (1965), Blinder and Solow (1974), Blanchard and Fischer (1989), Dewatripont and Tirole (1994) and Viscusi, Harrington, Jr. and Vernon (2005)) but otherwise they do remain circumscribed and ineffective and even distortionary (Friedman and Schwartz (1963), Sidrauski (1967), Gale (1983), Lucas (1987), Barro (1974), Wallace (1981) and Sargent (1987)). Policies like pro-growth liberalization, balancing fiscal intervention, stability augmenting and investor protecting financial regulation, monetary stabilization of asset prices and aggregate fluctuations, and equity preserving policies of redistribution do have their flaws and demerits and cannot attain dynamic efficiency, stability and equity in the dynamic economy satisfactorily. Thus, the world of finance is admittedly a second best world, but no better alternative paradigm exists without fundamental changes in human nature, society and politics. Having made a first pass at the necessity of a paradigm of financial systems, I now proceed to logically explain the essential nature of finance and how the financial system works

b) The Nature of Finance

Economic events can be understood as allocation of savings, trade, finance and production inputs across agents like households, financial institutions, governments and the producers. Economic history of nations (at any point of time) can be understood as the sequence of a date-event pairs that reflects a social mechanism for allocating resources over space and time. The fundamental driving forces of such an allocation mechanism are the heterogeneity of individual circumstances like differences in preferences, endowments, information, technology, and capital across individuals over time and space and motives for maximizing wealth accumulation and lifetime utility of consumption. Taken together, all this implies a need for resource transfer across space as well time. Trade across time is essentially a contract involving the future resource flows in exchange for current and past resource flows. The theory of finance or financial economics studies this phenomenon and further refines it in a behavioural context. Finance itself is a discipline that studies the allocation of economic resources under uncertainty. This uncertainty can be symmetric in the sense that neither the borrower nor the lender knows whether the borrower will be able and willing to repay the same debt or it may be that the borrower knows the risk element better than the lender. Borrowing and lending is studied at the individual level, at the level of a particular market or at the societal level as a whole. The

role of finance in this sequence called economic history is called weakly essential if, there is some minimal heterogeneity among individuals across time that leads to atleast one type of financial asset (like money) being traded at all dates and having positive value. Clearly, very little heterogeneity is required to satisfy the essentiality of finance, posed in this way. In fact real world data would show much more variations in individual circumstances than that and would at every date generate many types of financial assets being traded, which leads to finance being strongly essential. Indeed when we look at the history of economic transactions, except those of the most primitive barter societies, there was always an element of contract for the future. And if we start from the ancient times of city-states, we certainly see the unbroken sequence of various types of contracts that are financial in nature.

Financial instruments, institutions and markets generate value adding activities like information production, screening, monitoring, risk sharing, diversification and inter-temporal smoothing. Without the support of financial contracts, financial intermediaries and financial markets there would be far less activity and much more inefficiency in savings, trade and production. Incentives for trading between economic agents some of whom are risk averse and the decentralized distribution of information and knowledge create the financial structure given the intrinsic uncertainty about borrower ability or incentive to repay and the transaction costs and benefits associated with such trades. Generally, risk neutral institutions insure risk averse individuals through risk sharing schemes embedded in financial contracts. However, as all futures markets cannot open to fully insure risk averse agents given information problems and transaction costs, the financial markets are imperfect. We briefly mentioned three problems in finance which cause misallocation of resources in financial markets and contracts. Now I turn to their causes and consequences.

Incomplete markets or less than full insurance for risk-averse agents entering into financial contracts arise due to moral hazard, adverse selection and transaction costs. Incomplete markets lead to financial market imperfections. These lead to strategic portfolio management, strategic trading of financial assets and strategic negotiations of financial aspects of contracts which affect the budget constraints of decision makers at every date. The economy is thus characterized by wealth accumulation through portfolio management, financial asset trading and financial contracting by strategic individuals and institutions. Borrowing constraints and liquidity constraints imply that the economic growth process is slowed down and the distribution of assets and income become more unequal over time.

Incomplete participation in financial markets implies that only a small fraction of the population holds assets traded in financial markets. This keeps markets thin and volatile. Liquidity provided by the financial markets is low and potential traders cannot be sure that if they want to liquidate assets in financial markets, they will be able to do so without a significant fall in the value of assets. Since thin markets react to asset trading significantly and with considerable uncertainty, financial markets are thus very volatile. Incomplete participation causes market thinness and volatility and in turn, these features of financial markets discourage new investors and traders from entering these markets thus reinforcing market thinness and volatility. Incomplete participation in financial markets leads to a high required return on an asset thus increasing the cost of capital for companies intending to issue securities in order to finance fixed capital acquisition. Those not participating in financial markets do not get a high return on their savings while those participating get a high risk adjusted expected return provided they diversify and choose portfolios prudently. This implies that the degree of wealth inequality increases considerably over time.

Contracting related problems arise due to moral hazard, adverse selection and due to unforeseen contingencies during contract formation stage (see Hart (1995) and Laffont and Martimort (2006)). These information problems lead to important role for the net worth and balance sheets of borrowing firms and individuals during credit contracts formation or renegotiation. A sharp drop in stock market leads to lower valuation of net worth and balance sheets together with the lower value of securities pledged by firms to banks while entering into credit contracts which can serve as collateral. As a result lenders become unwilling to lend. Further, firms and individuals are inclined to pursue risky strategies to recoup losses due to stock market losses and losses in operations and this makes lenders further disinclined to lend. A lower value of net worth thus leads to credit rationing, lower level of investment, a fall in economic activity and further fall in the value of assets leading to a further fall in net worth and thus creates a cyclical downturn in aggregate economic activity. The opposite happens when the value of net worth of firms and individuals rise.

c) Financial System Performance

The performance of the financial system can be judged by the efficiency in allocation generated by the transfer of funds from savers to investors with different risk-return-liquidity characteristics (see Mishkin (2010), Cottrell (1979), Kindleberger (1993) and Cameron (1972)). The financial system consists of financial assets or securities, financial institutions and financial markets. The financial system is heavily regulated to protect the investors and the institutions. How does the financial system work and how far does it achieve the targets of high level and rate of inclusive growth of output (with concomitant benefits for employment), price stability

(low rate of inflation) and rational asset valuation over time (with reduction of inefficient asset price bubbles)? In this subsection, I characterize the value generation properties of the financial system with respect to its components.

In the financial system, money plays an essential role and has positive value. This is because dynamic economies involve inter-temporal resource transfers like property transfer, goods transfer, renting and leasing, lending and borrowing and savings and investment, all of which needs a cash in advance or a deferred unit of payment acting as a medium of exchange and store of value while providing the socially useful role as an unit of account. This is the essential role of time in generating a demand for money in dynamic economies. But why is money demanded when other assets can be held which give higher return? There are three main reasons: the inconvenience of barter (see Robertson (1922)), possible illiquidity of other assets in a dynamic economy (see Hicks (1989)), and the fact that money is a relatively safe asset than others (see Tobin (1958)). How does money work in affecting output and prices? In the short run, increased money supply causes interest rates to fall, asset prices to rise and thus stimulate investment in all kinds of assets (in particular physical capital and real estate). This increases the nominal as well as the real value of national income in a generally recursively demand determined system with slow reaction of nominal contracts to increased money supply or increased money growth. However, in the long run (which maybe two to three years), increased monetary growth translates into a slightly lower rate of inflation than the money growth through a cyclic propagation mechanism (see Dornbusch and Fischer (1987)) with a much less impact on output and employment (this effect is still positive since higher money growth increases the investment spending and spending on R&D which positively affect aggregate supply).

It is also important to understand the role of financial intermediaries and financial markets in facilitating inter-temporal trade and in particular, that of capital accumulation. Investors generally entrust their funds to financial institutions and delegate the financial intermediaries to observe and regulate the value of their investments under conditions of asymmetric information and transaction costs. Financial intermediaries in turn, contract with firms to enter into credit contracts (commercial banks) or buy stocks in the financial markets (mutual funds, pension funds and insurance companies). Credit contracts boost demand as well supply and make for economic growth. At the same time, the deposit contracts insure investors against liquidity uncertainty and enhance savings and increases the money multiplier through a lower currency-deposit ratio. However, banks have to use their funds prudently since under a fractional reserve system (where reserves are less than deposits), bank runs and failures can occur. Funds available to firms are used to buy labour and capital which in turn means that wages will be spent to boost aggregate demand while investment expenditure will promote growth through capital accumulation on the supply side and add to aggregate demand on the demand side. Expenditure on R&D implies further boost for aggregate supply and medium run and long run growth. Investor funds routed to financial markets through financial intermediaries like mutual funds, insurance companies and pension funds create a higher risk adjusted return on savings (through the expertise of the financial intermediaries in choosing value adding shares and in diversification of the portfolio of the investors) and lower cost of capital for firms which want to make value adding investments from time to time. Banks and other financial institutions and the financial markets ensure production of useful information and the necessary actions contingent on those information structures which lead to necessary and incentive compatible credit contracts and incentives embedded in delegated financial intermediation activity like liquidity provision, screening and monitoring and restrictions on activities due to risk management. However, as and when cost of funds increase and/or the information problems increase acutely, inefficient liquidity provision, credit rationing and fall in asset prices arises to a significant degree. To some extent this can lead to welfare losses and output loss.

It is important to understand the nature of financial markets and the costs and benefits of dynamic portfolio management and dynamic trading in financial markets and financial innovations in general equilibrium and disequilibrium under transaction costs and complex risks. Individuals and financial institutions try to maximize expected portfolio value at any point of time and if selling an asset from the portfolio or buying a new asset increases portfolio value, then selling or buying occur. In a market with heterogeneous traders, continuous buying and selling occur and prices of traded assets keep moving up and down. Markets are information-efficient if all kinds of relevant information are taken into consideration in financial asset portfolio construction at every date by every trader. The inverse of the gross rate of interest is used as the discount factor when the present discounted value of an asset is computed. When expansionary monetary policy reduces the interest rate, higher cash flows are generally anticipated and the value of an asset increases and cost of financing the asset purchase declines which leads to a higher demand for many types of assets. The converse happens when contraction in monetary supply takes place. Thus credit driven bubbles are possible under uncertainty. When the economic growth process is stagnating, easy money policy can generally ensure that credit driven bubbles are created (through increase in the value of collateral and expected increase in cash

flows from different assets directly affected by easy money policy) and sustained, until economic recovery occurs sufficiently. However, excessive reliance on such bubbles to promote economic growth can be costly as the bubbles can burst and reduce investment spending and cause illiquidity and insolvency to many important participating institutions and individuals.

In dynamic economies, different kinds of financial innovations are needed in order to optimize the efficiency of production, facilitate trade and smooth consumption paths. Risk taking for high growth activities need to be protected by risk sharing arrangements and capital cushioning. Stability in the small and large contexts needs to be addressed through provision of reserves and stabilizing instruments. Inequality in different forms needs to be anticipated and tackled by risk sharing contracts which may be completely financial or also complemented by social risk sharing devices or political alliances for lobbying over resources. There are many impediments to forging such contracts like the costs of proper assessment of risks and the costs of information on the variance and covariance of risks of securities in different portfolios, cost of getting together and search for the ideal contractual partner, costs of making markets, costs of trading, bargaining costs over the terms of the contracts under different imperfections (like incomplete information, behavioural inconsistencies), costs of commitment, costs of information acquisition, cost of credible information transfers, costs of contract drafting and understanding costs, costs of verifying to courts and so on. So first, we need to understand such contracts from the perspective of transaction cost economics. Debt contracts together with periodic auditing arise due to verification costs, commitment costs, signalling costs and costs of transfer of control. Equity contracts exist because of costs of risks which need sharing, costs of issuing debt like bankruptcy costs, costs of not sharing control rights etc. Financial derivatives like options and futures are used for hedging risks and can promote the growth process under conditions of severe uncertainty. Rental contracts are partially financial due to cost of monitoring, enforcement costs, eviction costs etc. Employment contracts are financial because of credit rationing phenomena in the generation of wage bill, structural properties of the economy and contractual incompleteness and limited participation.

Financial innovations by governments through the issue of securities and taxation should also be considered as part of the financial system. Public debt and taxation are part of the financial system because of the need for government expenditure for stabilization, growth and equitable transfer system. Apart from these normal functions in public finance, there are also additional contingent functions like strategies for resource mobilization during war or other kinds of emergency, post-war or post-emergency reconstruction and for maintaining peace through expenditure on various items externally and internally.

Financial regulation is aimed at negotiable instruments, financial institutions and financial markets. The law relating to negotiable instruments indicate which types of promissory notes, cheques and drafts are valid for issuance and the transfer of possession. Banks are regulated through capital requirements, liquidity requirements, deposit insurance, asset restrictions and information disclosure requirements. These raise the cost of operating a financial intermediation business and raise the lending rates thus increasing the already existing problems of adverse selection and moral hazard. Thus, there are tradeoffs in regulation of banks and other financial institutions. Financial markets are regulated through restrictions on transactions, restrictions on assets and information disclosure requirements. These are meant to protect the investors who do not have the time or the expertise to monitor their financial market transactions in detail.

In dynamic economies, contractual structures, profits, incomes of different segments of society are generally changing due to real as well as financial reasons and changes manifest in forms of real as well as financial changes. The causes are not well understood. In this paper I shall characterize a paradigm where these causes-consequences chains can be understood better. This will lead us to a better discussion about positive and normative analysis. This will lead to a more refined understanding of economic dynamics in a complex world and shed new light on dynamic efficiency, stability and distributive fairness.

III. The Theoretical Framework

The financial system is the core of the economy as it generates inter-temporal contracting over different kinds of resources. A Financial System is a system of borrowing and lending and repayment and renegotiation of debts of different kinds. It is a structure that generates financial transactions represented by debts (in various forms) and credits between participating individuals and institutions in an economy that is revised at the end of every period by means of new payments and new explicit and implicit financial contracts. It represents on one hand the financial structure of the components like households, firms, financial intermediaries and governance cum regulatory frameworks and, on the other hand, the contractual relations and markets between the components in various manifestations. In general it is suitable to classify financial systems as bank oriented or market oriented (see Boot and Thakor (1997), Fabozzi, Modigliani and Ferri (1998), Clark (2000) and Allen and Gale (2000)).

A financial system has two pillars: the law and the accounting framework. Law defines and protects the system of property rights which is the basis of private

ownership economy. It also regulates the contractual structure of the economy and defines what debts are binding, in what form, and between which parties. The accounting system provides the guidelines for evaluating economic transactions, measures debts and defines the viability of financial claims by recording the assets and liabilities in balance sheets and by recording income in profit and loss accounts of economic agents and institutions.

The financial system comprising of families, networks, institutions and markets generates the structure of trade, production and consumption. Savings are allocated through intermediated structures like financial institutions and markets. Financial system allows risk taking, risk sharing, diversification (through portfolio management), risk management and inter-temporal smoothing of income and consumption. The risk-return-liquidity characteristics of financial claims determine the performance of financial systems.

There are several actors belonging to different families in the stage and they interact within a financial system where they take decisions given economic system history and rules for formation of reasonable expectations. History creates and recreates date-event pairs in many guises. Individuality of families is preserved through recurrent attempts to advance in terms of lifetime utility maximization in each family. Competitive process leads to innovations in markets and institutions and paths are created for self-selection in different contracts offered by different institutions to individual members of different families.

There are many families at each foreseeable date. Some families are political in nature, some are in control of financial intermediaries, some are those of entrepreneurs who manage firms, while the rest remain simple households whose starting earning members are workers. All families face simple and complex constraints and try to maximize family welfare over time. The household supplies labour services. There is incomplete participation in the sense that a worker who is a household member may have little influence on financial markets and decisions in institutions like firms, financial institutions and other government and non-governmental organizations. The entrepreneur is constrained in his decision making by market circumstances, corporate mission, the board of directors and the labour union. The banker is regulated by the monetary and fiscal authority and has limited decision making power. The average worker earns a limited income and invests little in financial markets where he is constrained by information and trading strategies of insiders. The entrepreneur tries to raise money from banks and the financial markets and normally does not invest in his professional capacity. The banker may invest in the financial market if not restricted in different ways and even if not restricted, may invest only a modest amount because of the lack of liquidity and lack of "normal" high in the financial market. Only those individuals having a wealth above a threshold invest heavily in financial markets because they become privileged members or insiders and earn high returns due to the presence of increasing returns like fixed costs of acquiring information on assets. However, there is increasing though structurally determined cycles of socio-economic mobility of economic agents between these families and institutions and I shall discuss them in detail below. Political families play the financial market games as per political motives and under ideological and democratic constraints.

Before discussing the different types of families, I shall describe the "social network" in a financial system. Each of the household members are either unconnected or connected to some members of political, entrepreneur and banking families and this increases their relative chance of getting an government or institutional job or getting bank loans for different investment or consumption purposes. Entrepreneurs in firms are connected to different financial institutions which increases their ability to tap financial resources for their businesses. Political family members are connected to all other families though relative strength of social relationships varies. Note that connections may vary in social quality with reciprocal likings, bondages and distances between any pair of members from different types of families. Also note that initial connections and social networking may lead to a more dense set of connections resulting in complex social relationships. All these affect the search costs and information about jobs, access to funding in financial markets, business opportunities and the relative influence of individuals, families and institutions. The social network is especially important for the members of political parties who search for prospective voters, potential party members and supporters, and try to influence voters with party positions on different social, economic and political issues.

There are a certain number of families whose members are mostly devoted exclusively to political work and related to the different political parties. I shall call them "political families". Political parties define themselves on the basis of ideology, certain traditions and visions consistent with ideology and traditions. Political families engage in political arguments in the public sphere, lobbying, periodic political campaigns (especially prior to elections), and campaign fund raising activities. Members of political parties search for influence opportunities and resource raising activities in social networks.

There are a certain number of households or working families to start with, and each household has some initial old (retired) members, some working members and a number of children. Household members provide work effort, earn wages, consume commodity bundles at each date, and save a part of

their wealth in the form of various financial assets like money, stocks, bonds, mutual fund units etc. Households can also borrow against uncertain future income and wealth subject to debt constraints imposed by banks. At each date, a household member is already employed or not employed in any previously chosen job and he either gets no job offer or a single offer (without loss of generality, since multiple offers could be ranked uniquely) of a contractual job at each time t where the contract offered by a firm consists of a starting wage, job description, an implicit promotion profile and the duration of the job. If there are high switching costs in transition between states like unemployment to new job or existing job to new job, then a job offer may not be taken. Note that a household member, after working some time as a worker in a firm or in a financial intermediary, can decide to become an entrepreneur in a firm or a financial institution if she has the expertise and can mobilize the resources to start the business and if she earns a greater lifetime income that way. Poor members of the household are either unemployed with insufficient assets to tide them over the medium and the short term, or workers who earn very low wages as in the informal urban sector or in farm employment in less developed rural neighbourhoods.

Firms are value maximizing or discounted profit maximizing over the entire life span of the firm (I omit not-for-profit institutions for simplicity and without much loss of generality). In order to avoid myopic decisions and waste, an entrepreneur of a firm is allowed a fairly long and sometimes an open horizon contract. While the management of a firm is in the hands of the entrepreneur so long as she is in the firm (though she may also indirectly contribute to the future of the firm even after departing by virtue of setting of the firm at a good or adverse path), she is subject to constraints influenced by different kinds of stakeholders like the government, board of directors, shareholders, labour unions, non-union workers, buyers, suppliers etc. Subject to all the different constraints, the entrepreneur maximizes firm value. She decides on the buying and selling of securities, on the employment of production workers, R&D workers and managers and she sets wages, prices, R&D determined qualities and product differentiation and decides on the quantities of raw materials, consumption goods and investment goods to be purchased. At each date, the firm faces three budget constraints. The first budget constraint states that the value of the wage bill (of all types of workers) plus the value of all non-investment goods purchased must be less than or equal to the amount of bank borrowing plus available internal funds earmarked for such expenditure. The second constraint states that the amount of bank borrowing is less than or equal to the value of securities pledged as collateral. The third constraint states that the value of investment expenditure is less than or equal to value of net issue of securities plus the availability of internal funds earmarked for investment expenditure. There is a pecking order: internal funds being cheaper (due to agency costs of external financing) are used up first in each budget constraint. Now I briefly describe the technology of the firm. There are diminishing returns to factors with (stochastic) constant returns to scale and increasing marginal cost and a fixed cost. Production and R&D takes one period. R&D stochastically increases worker productivity (of all types of workers but differently), improves quality of the finished product produced by the firm and sharpens product differentiation. The firm has a conjectured demand function based on past experience and given the cost structure, it determines a price which is an optimal mark-up over the cost (expected marginal revenue being equated to current marginal cost with maximum value added to lifetime operations) and attempts to produce an output which is expected to be demanded at that price. It also determines an inventory policy based on the marginal cost of accumulating inventory relative to the marginal cost of production. It is important to note that management is not only mechanical optimization routines but also proper planning of strategy and control, communication and coordination, supervision and general human resource management practices. Management vision, motivation and ability to seek rents and skills (see Milgrom and Roberts (1992), Hart (1995) and Allen and Gale (2000) may vary from one entrepreneur to another. If there is an entrepreneur with better vision and management skills in the same type of industry, and if the market for corporate control works well, then entrepreneurship can pass over to the new entrepreneur. Otherwise, the incumbent entrepreneur enjoys some rent in the form of cash flow diversion and perks which she can maximize without being subject to exit induced by firm stakeholders. When an entrepreneur exits her job due to insolvency, takeover or a better opportunity somewhere, I assume that she either joins the workforce as a senior manager given such an opportunity, or starts a new enterprise if she has the relevant vision and can mobilize resources. Which option she takes depends on different feasibility constraints and relative monetary and non-monetary payoffs.

Financial intermediaries mobilize savings from households and other units in the economy with financial surplus and invest the funds generated in financial assets of different kinds. There are different kinds of financial intermediaries like commercial banks, investment banks, mutual funds, pension funds and insurance companies (see Sayers (1967), Carosso (1970), Freixas and Rochet (1997), Bhattacharya, Boot and Thakor (2004), Thakor and Boot. (2008)). Commercial banks mobilize savings as deposits which are partly set aside internally as reserves. Some of the deposits are lent to firms for funding the wage bill of the firms and for funding the non-investment goods

expenditure of firms. The rest of the bank deposits are invested in different financial assets within the regulated permissible limits. Investment banks generate fee income from underwriting of securities and earn profits from financial asset trading, securitization, financial engineering and takeovers and mergers financing. Mutual funds issue claims to fund profits in different kinds of portfolios and fund managers engage in continuous active portfolio management to increase fund value and management returns. Pension funds use funds generated periodically from lifetime savings for generating retirement income by investing in different financial assets and engaging in active portfolio management in a conservative way. Insurance companies collect insurance premiums periodically and manage portfolios of financial assets so that they can maximize value subject to be able to meet the insurance claims.

A commercial bank manager collects savings and provides liquidity through deposit contracts. He usually tries to maximize deposits while at the same time ensuring that there are enough as reserves to meet uncertain liquidity demand under various contingencies (an extreme example would be a bank run). Investors want to lend for a relatively short term in safe assets while firms usually want to borrow for long terms for risky undertakings. This mismatch is avoided by the commercial bank which borrows short and lends long and absorbs and manages risks. This value addition by the bank is known as term transformation, and the resulting risk due to asset-liability term and interest rates mismatch is taken care of through suitable reserves management, market risk management and liquidity management policy contingent on information on depositors, firms and economy. There are other instruments as well which give flexibility in bank liquidity management policy (the call feature of bank loans is one example). A bank generally has a historically acquired comparative advantage in some lines of financing (tea, auto, chemicals, construction, utilities, hotel chains etc) and focuses on the areas of comparative advantage but also engages in other areas for the purpose of portfolio diversification. Credit risk management requires charging high rates of interest apart from requiring high value collateral and covenants. But high interest rate also attracts borrowers with low ability (adverse selection) and little intention to repay (moral hazard) which requires the optimal interest rate to be "not too high". There are also other risks like interest rate risk, default risk, operational risk and insolvency risk that a commercial bank faces and tries to manage through keeping loan rates indexed, requiring high value collateral, having proper control, communication and supervision along the bank management hierarchy and by screening borrowers and buying "bankruptcy insurance". Investment bankers process information about clients and financial markets and provide advice and fee based services on evaluation based on such information processing. They also produce value adding financial products and services and engage in securitization and trade of stocks, bonds, options and futures. Asset management companies take risks according to returns associated with such risks and subject to constraints on risks demanded by their very nature. Generally speaking, insurance companies and pension fund companies take less risk than mutual funds relative to volumes traded and portfolio size. Risk taking increases with signals about good prospects of financial markets and the economy, the skills of the management team in charge of active portfolio management and with the increase in the quantity of reliable information prior to trades.

At the end of each government election period, political power is allocated among political parties in the executive office and the parliament. One member from a political party is elected for a fixed term as the chief executive in government and with the help of a selected team, has to take political, economic and fiscal decisions under some budget constraints. The chief executive in government also chooses the executive of the central bank of the economy. The central banker is responsible for monetary policy. Apart from taking political, economic and fiscal decisions, the government also has regulatory institutions for different industries. The judiciary and legislature also regulates economic and political activity by interpreting and making laws.

Government manages fiscal policy, financial restructuring and regulation subject to budget constraints. Governments try to maximize social welfare using subsidized short run welfare programs for unemployment insurance and poverty alleviation and for reliefs in emergencies, running long lived welfare programs like social security, by managing strategic public sector assets and by regulating industries. Welfare programs are targeted to individuals as well as groups and ensure approximate optimal accumulation of different types of capital. For example, optimally designed social security programs prevent over-accumulation of capital in developed economies while deregulation and liberalization policies ensure that under-accumulation of capital in less developed economies is countered. Government expenditures on such programs are financed by surplus from management of public sector, systems of direct and indirect taxation, public debt and monetization of deficits. Public debt is a burden imposed by the current generation on the future generations (see Auerbach and Kotlikoff (1995)). However, repayment of the debt can only be done through taxation on the future generations which cancels out the welfare gains as ingeniously argued by Ricardo (1846) (and later formalized by Barro (1974)). Recourse to future monetization to meet the debt does not cancel the debt but only changes the composition of the debt by generating what is known as

an inflation tax. However, public debt can lead to better risk sharing among generations since unlike private securities, it is a safe asset (see Allen and Gale (1994)). Historically, financial revolutions led by public debt issues were successful because they introduced a safe asset in a risky market environment with incomplete opportunities for risk sharing. This aspect of the financial revolution continues to be perfected in developed as well as developing parts of the world to raise intergenerational welfare by management of debt through optimal timing of retirement and reissue of debt keeping in view the different considerations like minimizing the cost of capital, implications on economic growth and stability and the mobilizing of public savings.

The monetary authority manages liquidity injections and withdrawals through debt repurchase contracts. Monetary authorities generally operate through reserve requirements, discount window lending based on mechanisms to maximize revenue subject to welfare maximization and open market operations altering the composition of money and bonds in the financial asset base. While fiscal policy is supposed to take care of concerns about growth and equity, monetary policy is supposed to take care of stabilization of the economy along the warranted growth path and generate the optimal combination of inflation and unemployment rate. Nowadays the monetary authorities are also entrusted with regulating asset bubbles. The monetary authority has to maintain a diversified portfolio of important currencies including a sizeable portion of reserves of the home country to counter exchange rate risks and possible runs on currency.

Regulation takes the most obvious shape in fiscal and monetary policy. Fiscal policy manoeuvres affect growth and redistribution and sometimes the stability. Monetary policy tries to regulate the inflation and asset prices around the natural rate of unemployment. Regulation of households takes the form of tax and social security benefits (broadly defined). Firms are regulated by license requirements, information disclosure requirements, and by regulation of prices, quantities and qualities. Financial intermediaries are primarily regulated through liquidity, capital and information requirements. Financial markets are also subject to various information and transaction related requirements.

Next I describe the markets in a financial system. The goods market is characterized by imperfect competition. At any date in any industry, depending on the difference between expectation of quantity demanded and actual demand, the consumption goods markets clear through rationing based on the minimum of quantity demanded and the available stock of goods (inventories accumulate at a certain rate relative to optimum prompting changes in production and inventory policy). The capital goods allocation is determined through demand from the consumption goods sector and determined by bilateral bargaining and contractual negotiations. The labour market at any date in any industry, is characterized by the minimum of the net demand for labour (determined by both new hiring and retrenchment) as a function of demand expectations in the goods markets and on the supply side, by the segment of the labour force searching for jobs and willing to work only at the wage schedules offered through contracts. Thus, there is a combination of search unemployment and involuntary unemployment. Now I come to financial markets. There are four main types of such markets: the market for bank credit, the (short term) money market, the primary market and the secondary or stock market (where stocks, bonds, futures and options trade). Bank credit contracts are determined by commercial bank risk management, bank competition, competition for funds among borrowers and the macroeconomic environment. Given client differentiation and discretion in decision making, one finds a host of phenomena like pro-cyclical credit, credit rationing, preferential loan commitments, retail market loan pushing and interest rates indexed to key market rates. The money market allocates short term funds or liquidity as per financial institutional needs and various "short term papers" are traded in exchange. Given different information structures and individual circumstances, repeated trading of financial assets determines asset prices over time. In primary markets, stocks of securities made available for sale (through underwriting by investment banks) are greater than demand in low phases of the secondary market and exceeds demand during high phases. The quasi-walrasian secondary market provides liquidity for investors and determines the wealth of a nation through allocation of savings in different types of financial assets. The secondary market performance depends on the changing structure of information about fundamentals of risks and returns and is influenced by traders who affect the liquidity of the market significantly.

IV. Financial System Performance and Economic Dynamics

I am interested in the laws of economic dynamics and the origin and distribution of individual welfare in dynamic economies. Prudential regulation is of great importance due to many reasons. First, there are departures from dynamic efficiency due to incomplete participation, contracting related problems and incomplete markets for risk sharing. Second, the economies are financially fragile and unstable. Third, inequality persists (and sometimes increases) in the dynamic economies. Fourth, social justice and individual welfare usually remain far below the maximum, being subject to different kinds of welfare distortions and various other market and institutional constraints. Financial system performance and policy measures

required are central to all these problems. I shall present the most important issues to be examined and deal with positive and normative questions (see Gale (1983), Mishkin (2010) and Mallick (2020)).

a) Dynamics of Families and Institutions

Given the governance mechanism, the basic components of the financial system are households, firms and financial intermediaries. I give a preview of the dynamics of families and other institutions. Poor families in poverty traps struggle to provide basic consumption and investment goods including health and education to family members and especially children. Circumstances and strategies help only some of the families to get completely or partially out of poverty traps and provide a better future for the children. Governments may provide subsidies and welfare schemes to periodically lift certain sections of the poor families out of poverty traps. Subsidies can cover basic consumption and investment expenditures, subsidized loans for value addition to human capital like education, health services, high value informational services for increasing productivity, literacy, ability to handle bank accounts and learning about better occupational opportunities etc. The middle class and the rich pay taxes which finance these subsidies and prudential regulation warrants a high welfare achievement of these fiscal programs relative to the opportunity cost of funds to tax payers. Middle class families try to ensure that children get quality education, good value systems and family guidance to become productive in chosen occupations and independent and adaptable to confront and utilize the complexity of the economic system like climbing the corporate ladders fast given contractual and organizational setups, provide leadership in chosen occupation, become entrepreneurs or managers in financial intermediaries and develop ability in managing their family lives well. Firms and financial intermediaries try to ensure value maximization under all contingencies and control of the institutions by family members as long as family members are able to provide high quality services to their institutions. New firms and entrepreneurs come with technological innovations and changes in management technology. New entrepreneurs also bring new strategies of value maximization and quality in operational management. Financial opportunities like greater likelihood of obtaining bank loans for starting new businesses, possibility of raising capital through investment bankers or from venture capitalists and value adding financial innovations also unleash the latent entrepreneurial talent in the economic system. New methods of risk management lead to better performance in financial intermediaries while failures of excessively leveraged and highly illiquid institutions lead to financial turmoil. Prudential regulation requires that high value technological and financial innovations are encouraged and marketed through suitable institutions and markets but excessive risk taking and corrupt financial practices are discouraged through various rules and discretionary regulations. However, due to adverse selection and moral hazard it is difficult to keep high risk taking and corruption in check.

b) Market Processes

I also focus on the dynamics of markets or the "market processes". The dynamics of goods markets, labour markets and financial markets are studied separately as well as together as "integrated market processes".

i. *Dynamics of Individual Markets*

Dynamics of the Goods Markets

As described in the previous section, the goods market is characterized by imperfect competition. The imperfect competition essentially means that that there is a schedule of expected demand based on the choice of prices, quantities and qualities faced by a firm at any date. Thus at each date, each firm in any industry sets a price, the levels and composition of employment between different types of workers and the amount of investment expenditure.. At any date in any industry, depending on the difference between quantity supplied (through existing stock and quantity produced) and actual demand, markets clear primarily through rationing based on the minimum of quantity demanded and the available stock of goods. Inventories accumulate or get depleted at a certain rate relative to optimum. In the goods market, prices do not necessarily change over time with growing excess supply or demand as firms are also tied by other considerations like cost of inputs, the quality signals of prices, competitive pressures (like threat of losing market share by raising of prices and less than competitive profit in reduction of prices) and expected changes in demand. But if there is a permanent change in demand, then over time, firms begin to revise their price schedules. But these price changes are dependent on industry wide distribution of prices and the wholesale price indices.

Investment goods are produced through market based transactions as well as repeated contracts. Standardized but differentiated investment goods are transacted through the goods markets by bargaining over contracts. Plants and machinery with specific features are transacted through contracts between producers. Investment goods are most volatile. The reason is that macroeconomic shocks lead to consumption smoothing that is sustained by changes in the pattern of capital accumulation. Also, animal spirits based factors leads to frequent perceived changes in the marginal efficiency of capital and leads to unstable demand for investment goods over time which may or may not be accommodated by financial markets. However, if bankers share the animal spirits of entrepreneurs, then asset bubbles may take place from

time to time and end with significant adverse consequences.

If there is a permanent change and growth in demand for quality products, then over time, firms begin to increase production by hiring more production workers, by hiring more R&D staff and by hiring more management staff, provided bank borrowing constraints do not bind. As mentioned before, these expenditures boost aggregate demand as well as aggregate supply. Moreover, there is a multiplier operating as increasing expenditure by firms with higher demand growth leads to higher incomes which are spent partially on the products of other firms. But firms may be averse to R&D and usually running with idle capacity. Thus firms are more short term oriented as a result of which the medium term and long term growth suffers. Regulation through legal institutions, fiscal and monetary policies that takes the goods markets towards an optimal path is an issue. If regulation is uniform and provides incentives for R&D, if taxes are low and selective investment tax credit is available and if growth of the money supply is accommodative of economic expansion and reduces the interest cost of borrowing from banks and financial markets, then goods markets develop and grow sufficiently.

Dynamics of the Labour Market

In order to understand the dynamics of the labour market, it is important to understand the following two mechanisms: (i) the search process in the social network whereby employment and unemployment occurs (ii) the different aspects of labour contracts. Lastly, an integrated analysis of these two mechanisms gives us the correct insight.

Let me first outline the search process. For an individual, the probability of getting a good current wage offer, a good future wage offer given job search and a possible low probability of retrenchment are related to his connections in the social network. In the social network, the employers post wages among their connections. Employers face a high benefit of hiring given low hiring costs under high unemployment and depending on expected demand for goods. At any date, a potential worker is confronted with a maximum wage offer. There is a positive probability of being retrenched at every date. Search is time consuming and a substitute for working. Therefore, at any date, the individual either accepts the wage offer and works or engages in search. The potential worker has two possible (starting) state variables. He has a historically given savings and liquidity profile. The potential worker has to take the decision of accepting the maximum wage offer (which may also be null) or searching for a better job in the future. His reservation wage equates the value of acceptance to the value of search. The reservation wage varies directly with the expected future wage from search and the probability of retrenchment. Many economists have emphasized that employment may become finance constrained when aggregate demand falls. However, notice that finance matters on the supply side as well, as the reservation wage also varies directly with accumulated savings and liquid assets in hand due to wealth and liquidity effects. Notice that conditional on natural rate of unemployment given the cyclical economic growth path, search unemployment is negatively serially correlated over time as high unemployment in one period reduces employer hiring costs and leads to lower unemployment and higher hiring costs in the next period. However, during high phases of economic growth, unemployment tends to fall over a period of time as the search process becomes more productive. Further, workers latch onto the opportunity afforded by new jobs so that they can accumulate assets for future contingencies

Next, I come to labour contracts. Generally speaking, there are three broad theories of labour contracts: (i) implicit contract theory (ii) insider-outsider theory and (iii) efficiency wage theory. According to implicit contract theory, risk-averse workers do not have complete income insurance in financial capital markets and therefore, firms which are risk neutral due to pooling of financial resources by large number of shareholders can profitably offer stable incomes to workers. The implication is of course, that there are nominal rigidities in the labour market despite changing demand and thus employment will vary accordingly. The insider-outsider model gives an account of how wage and employment are decided in the bargaining with the firm and the union. An implication is that union members will hold onto rents under different scenarios. The efficiency wage postulates that an employee will be paid a high wage as an incentive and a hiring threat contingent on shirking as a disincentive. The efficiency wage can be sustained only if there is a significant probability of being unemployed after being retrenched as this keeps the disincentive effective. In the context of this paper, I assume that firms provide efficiency wages to employees with the usual disincentive.

The demand for labour is the minimum based on the demand expectations in the goods markets and the availability of financial resources for employing labour given possibilities like credit rationing, loan commitments etc. The labour market at any date in any given industry is characterized by the minimum of the demand for labour by net new hiring (after adjusting for voluntary exit and retrenchment by firms of workers willing to go on) and the supply of labour force.

The supply of labour consists of new workers, those voluntarily exiting from employment contracts or being retrenched in the previous periods and yet to find a job, and the rest of available workers searching for jobs and willing to work at various wage schedules offered through contracts depending on their preferences, search costs and alternative opportunities.

Thus there is a combination of search unemployment and involuntary unemployment due to wage stickiness as well insufficient demand in the goods market. The labour market consists of a vector of past and present contracts (some of which overlap into different future dates). As mentioned before, each of the contracts consist of the length of the contract, the job description depending on different contingencies in the job (I assume the contracts are rarely fully specified for each contingency and therefore they are generally incomplete) and the wage profile throughout the length of the contract.

If there is high growth in demand and additional workers are required, then hiring, wages and contract lengths tend to get raised but subject to a continuity with existing contractual structures or past contracts. If demand falls due to an aggregate shock to productivity (such as a pandemic) such that existing labour force is not fully utilizable for some considerable amount of time, then firms engage in wage cuts and retrenchment of labour and very few firms except the very growing and profitable ones offer new contracts. Labour market policies are very hard to formulate under such a circumstance and effective implementation requires support from other types of policies. Supporting high unemployment insurance through fiscal and monetary policies can be particularly difficult.

Dynamics of Financial Markets

Money markets are markets for short term funds which are secured through various financial assets. Money market interest rates fluctuate considerably, being tied to support the monetary mechanism of the economy. When money market rates like interbank lending rates increase, they push up the cost of funds for banks and thus raise lending rates. Banks lend in credit markets with financial securities serving as collateral. Thus when the financial markets witness sharp fall, banks may be unable to get enough valuable collateral and engage in credit rationing to firms. On the other hand, during times when economy is booming, banks may engage in loan pushing activities. The primary market for securities is supported by investment banks who underwrite securities. The primary market activity is increased during a sustained boom in the stock market (the secondary market) and with a better position of the economy with respect to the fundamentals pertaining to real assets. The secondary market or the stock market is the market for long term securities which are bought and sold as per risks, returns and liquidity characteristics of the individual assets backing the securities. Financial dynamics in the secondary market is characterized by quasi-walrasian trading in financial assets which generally show a value growth trend but with cyclical boom-bust properties and periodic financial innovations and therefore, there is a feedback effect on the primary markets the dynamics of which is characterized by repeated financial contracting (with possible renegotiation) between investment banks and firms which change the structure of risk-reward-liquidity. Financial security prices reflect a lot of information, risk-reward appetites and liquidity positions of market traders but a lot of information is hidden since at any date there are many traders do not engage in buying and selling but wait for prices to change later such that they can engage in profitable trade later on. So, it is debatable that financial markets are information efficient. The allocative properties of financial markets depend on the possible incompatibility between information and allocative efficiency (Allen and Gale (2000)). Regulation of financial contracts, financial innovations and organized financial exchanges are generally stringent and exhaustive.

Credit cycles characterize the financial markets (see Hawtrey (1927) and Keynes (1936)). When banks and other financial institutions have enough surplus funds and reserves and when they expect cash flows and gains from investing in assets and therefore find that lending and investing will increase the present discounted value of their portfolios, these institutions will start lending and investing more. With credit constraints and funding constraints relaxed, firms will borrow more for hiring production and R&D workers and managers from banks and borrow more from financial markets and financial institutions to invest in physical capital. This will increase aggregate demand and aggregate supply and encourage more lending and borrowing in the economy through demand externality mechanism and the multiplier process. However, if over-expansion occurs then many firms may default on borrowed funds and some banks and financial institutions may suffer. The banks and other financial institutions then engage in credit rationing and the economy moves down to a new trough of a recession. After the recession has gone some way, banks find themselves with more reserves than they would like to accumulate and thus again start lending more and the recovery phase begins towards a new peak of the ensuing boom. The frequency and amplitude of the credit cycles can create irrationality and tensions in the financial markets and cause asset bubbles not driven by fundamentals.

ii. *Integrated Market Processes*

The markets for goods, labour and short term and long term securities generally tend to move together. I sketch some patterns below.

Consider a sharp fall in security prices which takes place due to contraction in monetary policy or the poor performance of a high proportion of firms which is expected to last for some time. The drop in asset prices implies a fall in net worth which is the collateral of a firm. Banks respond by rationing credit to firms experiencing declining net worth and collaterized security values. Investment spending and spending on labour goes

down in the economy which depresses aggregate demand and through a multiplier process, takes the economy to a low level of aggregate economic activity and a high value of unemployment.

Now consider a bursting of real estate or a technology stock bubble. Investors and financial institutions having a large exposure in these areas will have a significant wealth loss. These investors and financial institutions may default on their loan obligations leading to some further debt defaults across the economy. Some individuals may go bankrupt and some financial institutions may fail. Again, this could drag the economy down considerably.

Now consider a very tight credit rationing scheme by a large section of the banks. Borrowing constraints and liquidity constraints begin to bind for a large section of the consumers and firms who routinely borrow to purchase consumer durables and to hire labour respectively. This will affect spending in the goods and the labour market and drag the economy down.

Financial innovations like stripped securities backed by reliable cash flow rights, limited degree of unemployment insurance and partial coverage of bankruptcy (individual and / or corporate) insurance may reduce risks faced in assets and labour markets and thus increase spending. The increased spending in turn leads to economy wide high cash flows which supports the initial financial innovations.

c) Economic Growth

Now I turn to the relation between financial system performance and economic growth. Traditional growth theories have been developed in light of what is now known as the developed world. Such growth theories highlight the importance of savings through the financial system and productivity growth. A broad brush description of such family of theories postulate that growth usually comes through higher savings and more liquidity, effective demand, trade based on comparative advantage and resource based advantage, coordinated capital accumulation by the private sector under high financial returns to capital (invested in trade, production), technological progress (partly exogenous and partly endogenous through investment in R&D and human capital) and government induced systemic positive externality like an efficient legal system, high quality infrastructure and efficient regulation. Economic growth generated surplus is generally used to bring about improved liquidity provision, specialization, financial innovation, diversification and optimal monitoring by financial markets and financial institutions which raises the rate of return on capital thus reinforcing the growth process in turn. However, many risks may remain uninsured without suitable policies and markets. On the other hand, low growth results from lack of competitiveness, low level of technology, low level of savings, large population relative to savings and economic planning requiring scarce resources to be spread thinly over the population, inadequate development of financial institutions, the absence of broad financial markets, the distorting reactions of being subject to colonial surplus extraction in the past and excessive financial repression. These factors create a system of low level growth trap and only under some special circumstances like structural adjustment problems, unsustainable external debt and balance of payments deficits does such an economy develop a pro-growth dynamic liberalizing policy. Dynamic liberalization policies that lead to optimal growth paths lead to the promotion of financial accumulation through effective deregulation of institutions and markets, development of productivity growth and human capital through encouraging research and development, lifting the standards and reach of educational institutions, and unleashing entrepreneurship and high quality management through proper incentives built into the financial system. Under such a pro-growth policy, individuals and institutions are encouraged to take optimal risks given the protection by a social safety net and systems of risk sharing. However, as mentioned before, these programmes are subject to constraints imposed by effective demand. Also, while no doubt quite effective in the medium and long run, the policies can generally bring about only limited growth in the short run due to many socio-economic problems, political obstacles, instabilities associated with liberalization and structural problems of the economy creating formidable transaction costs. In order to achieve high growth rates in the short run, focus has to be shifted to a few high productivity industries and sectors and limit investment in other areas of economy at a minimum given the scarcity of resources. Socially and politically this is quite difficult to achieve, but if it does happen due to some fortuitous circumstances, then a significant opulence can be generated even in the short run.

The firm is the basic driver of economic system dynamics since investment spending and R&D boost growth on the supply side and employment generation boost growth on the demand side. Now consider a high and growing expected demand scenario. The firm entrepreneur will respond by increasing employment of workers, R&D staff and managers and increasing investment expenditure if she has access to funds. As soon as the production moves towards capacity constraint, more investment goods will need to be bought to increase capacity. If the firm has sufficient retained earnings then there can be purely internally financed expansion. Otherwise, the firm has to finance investment expenditure partly from available retained earnings and partly from selling shares in the market. In order to finance the wage bill (production workers, R&D staff and managers) and the purchase of all other non-

investment goods, the firm has to take recourse to bank borrowing with an equivalent amount of securities held by the firm as shares (I assume that physical capital is a specific asset and has no alternative use outside the firm and that no other entrepreneur can run the firm profitably. This makes physical capital not worthy as a collateral asset and I also assume that land owned by the firm is of low value due to limited size and location specificity). Thus, even if high and durable demand is expected, a firm which does not have sufficient internal funds can only finance itself if the stock market is booming thus enabling it to finance investment expenditure at a low external cost of funds and obtain wage bill financing by pledging the securities it holds. Further, the bank to the firm has also got to have an expectation of high and durable demand for the product of the firm which ensures that the firm can repay bank debt and costly recourse to collateral (securities) need not take place. If some firms are experiencing expected growth in demand in this way and similarly able to arrange financing by virtue of a booming stock market and optimistic bankers, their spending will increase incomes of other individuals and firms and will generate additional spending and increase the demand for the products of many other firms in the same way. The process can go at length through this demand externality mechanism creating an interaction between the multiplier and the investment accelerator. So if there is growth expectation for some firms, the demand externality mechanism ensures that it will be atleast partially fulfilled. The converse is the case for low growth expectations.

How does economic policy affect growth? What kind of policy is more effective? How should the policy mix change with circumstances? Let me begin with monetary policy. Expansionary monetary policy reduces the cost of debt relative to that of equity in the usual situation. With an expansionary monetary policy (consisting of higher money growth and lower cost of funds which lowers the rate of interest charged on lending by financial institutions) being pursued relative to past, the scale of operations of the typical firm will be increased (as the same marginal benefit of borrowing will be equated to a lower marginal cost) thus leading to higher employment, higher R&D and higher investment in fixed capital. Further, the easy monetary policy will provide incentives for higher entry in industry and reduce exit due to bankruptcy. Higher employment by firms will boost demand in a generally demand constrained environment (as already discussed above), higher R&D will increase productivity growth thereby increasing competitiveness (both in the domestic and foreign sphere) and tempering inflationary tendencies and higher investment will increase the growth rate and standard of living in the short run. However, one caveat should be mentioned: in a situation of absolute liquidity trap, the rate of interest cannot be lowered and thus monetary policy reduces its potency. Assuming that there is no liquidity trap in the general sense, why cannot an expansionary policy be always pursued? There are two clear dangers: the first is that when demand growth subsides there will be high inflation which will hurt the majority of the population with fixed wage contractual or permanent jobs (though there might be dearness allowance in wages, this cannot stop the increasing wage-price spiral with real welfare loss for a large section in the labour force); the second danger is that of new asset price bubbles being started with an expansionary policy which might burst with consequences like debt defaults, debt buildup and debt hangovers, insolvencies and illiquidity, incomplete projects and resource wastage. Fiscal policy can also be expansionary provided debt service ratio to GDP is not too high and provided other considerations allow it to be expansionary. This is rare. Even if conditions warranting expansionary fiscal policy through increasing the government expenditure financed by raising the public debt is warranted for the sake of restoring stability in the present and the near future, the future cost of debt build-up can be quite high given the generational accounting (see Auerbach and Kotlikoff (1995)). However, though tax cuts may not be feasible most of the time, investment tax credit policy can be pursued to boost capital accumulation and growth. Regulation should try to eliminate corruption and tax evasion and different kinds of regulatory arbitrage and remove barriers to competition and innovation. Note that, as already pointed out before, the process of economic growth is a process of gradual capital accumulation with inbuilt rhythms of booms and busts or cycles (no matter how irregular they may be), so the ideal policy should be to coax some growth when the economy is faltering, remaining indifferent through the majority of ups and downs and making policies which are restrictive when the economy overheats with risks of dangerous asset price bubbles and signals of unsustainable projects being pursued by the private sector. With this discussion, I turn to an examination of business cycles and corresponding policy.

d) Business Cycles

The same mechanism can generate business cycles (see Gertler (1988), Hawtrey (1927) and Hansen and Clemence eds. (1953)). Consider an initial high growth expectations phase for the representative firm. I assume that changes in past demand generate high growth expectations by the entrepreneur of the firm and require investment spending if production is anticipated to reach or cross capacity in the near future. This brings in the accelerator effect for each firm from time to time and one can surmise that it will be generally present for the representative firm. Then additional spending and the demand externality ensure that there will be an upward moving phase of GDP but which is cyclic as

determined by the interaction of the multiplier and accelerator on one hand and the interaction of the credit cycle and asset bubbles on the other hand. But after many firms have increased capacity substantially, there will be a slowdown of the demand externality process and there will be a natural expectation that demand will flatten out and that there will be idle capacity. This will reduce spending by firms and the peak of the business cycle is reached and the downward movement towards the trough begins. After a significant downward movement, interest rates and prices fall to sufficiently levels and demand picks up again and the trough is reached and the upward journey towards a new peak begins. And so on. Thus a business cycle mechanism is found in the same framework.

Financial crises are important in generating business cycles. Suppose some fairly large and leveraged banks become illiquid or insolvent due to non-repayment of debts by borrowers and a there is a simultaneous fall in asset prices. Thus affected banks cannot repay their debt to other banks. Thus other creditor banks become illiquid or insolvent. This can generate a contagion with significant non-repayment of debts and the relative magnitude of the crisis can vary depending on the degree of the fall in asset prices. Bank failures and financial contagion contract lending and reduce expenditure on labour hiring and investment goods thus ensuring that the contagion in the asset and credit markets spill over to the goods and the labour market. The contraction in aggregate economic activity can be very sharp and painful as was seen in the Great Depression and the recent Subprime Crisis.

I engage in a detailed investigation of financial stability and instability. Liberalizing pro-growth government policies or market innovations lead to high risk taking which, though fetching high returns initially, eventually become too high risky ventures since the financial system converges to a path of highest degree of optimism and highest risks and since negative externalities like corruption, congestion and skewed returns structures develop which are not properly internalized by agents with limited vision, bounded rationality and risk shifting characters. Financial system stays in a stable dynamic path as long as risk management is sound and reserves, liquidity and internal finance are used for inter-temporal smoothing and portfolio diversification is based on sound information and reliable projections of risks and rewards. Last, but not the least, financial stability is ensured as long as corruption free conservative decision making takes place in institutions and markets. Financial Systems become unstable due to periodic wealth dissipation caused by excessive strategic competition, lack of adequate corporate control, excessive leverage, illiquidity and insolvency of significantly important institutions, contagion of institutional failures, complex entanglement of debt obligations across diverse institutions, excessive risk taking caused by certain financial innovations, periodic artificial and short term asset price bubbles and crashes leading to the problem of lack of trust in financial markets causing excessive liquidity hoarding leading to liquidity traps, and lack of inter-temporal smoothing financial portfolios under incomplete markets in response to shocks created by coordination failures of decentralized competitive systems. Dynamic stabilization policies like fiscal transfers and monetary injections lose potency during financial instability if liquidity traps and restrictions on bailout packages (due to constraints imposed by requirements of fiscal programs for future periods and generations) develop.

Next I discuss the relations between multiple growth paths and different stability conditions. Low growth paths use low level of savings and are highly stable. If shocks to productivity or coordination failures occur which reduces national income then all that is required to restore the financial system on its initial path is a little more savings by raising the interest rate on bank deposits. For a high growth rate financial system, a destabilizing condition reduces income which in turn reduces savings and a very high interest rate is required to bring back the same level of savings. But a high interest rate on loans (which competition among banks induces after the interest rate policy) restricts borrowing or leads to credit rationing in a richer story. Thus the financial system may not be able to come back to the original high growth path. Forced savings through high taxation may be used by the fiscal authority, but it might lead to different distortions like tax evasion effort, low taxable work effort, leakages from government savings and investment programs etc. I end this section with a comment on the identification of a set of factors that drive business cycles around the different growth paths and a further comment on how business cycles can be controlled optimally.

Coordination failures in a decentralized economic system (see Cooper and John (1988)), shocks to productivity or demand, asymmetric information related problems in credit and labour markets, nonlinearities in economic relationships can separately or jointly produce phenomenon that is known as business cycles.

A prudential way of smoothing fluctuations caused by business cycles is liquidity injections by the financial institutions on a contingent basis focusing on the strategic and fundamentals driven aspects of the financial system. Too big or too influential to fail may be a policy worth pursuing on strategic grounds in order to counter financial contagion. Funding restructuring of insolvent firms whose reorganization value is greater than liquidation value (based on reasonable informational grounds) is another policy worth pursuing based on fundamentals driven ground. Such liquidity injections need to be in the nature of loans which can be

repaid as soon as the component which was the recipient of the loan can stand on its feet. If the effectiveness of liquidity injections is limited by different factors, then fiscal transfers may be needed. Stabilizing policy needs to be carefully formulated and implemented as there are lags such as recognition lags (recognition whether a shock is permanent or temporary), decision lags (decisions on policy take time), action lags (time elapses between a policy decision and implementation) and outside lags (the effect of a policy may be spread over time), uncertainty about private sector expectations reactions to policy changes and the uncertainty about the structure of the economy and shocks (see Lucas (1987) and Dornbusch and Fischer (1987)). A mix of rule based policy and discretion is required in the form of rule based activist policy.

e) Inequality of Wealth and Income Distribution

I have already argued that incomplete markets, incomplete participation and to a certain extent contracting relating problems have tendencies to develop and perpetuate wealth and income inequality. In this section I provide some further thoughts.

This book argues that financial processes are naturally skewed to generate persistent inequality and inequality in turn leads to skewed financial processes (see the discussions in Kuznets (1955), Herrick and Kindleberger (1983), Basu (194), Greenwood and Jovanovic (1990), and Ray (1999)). The link between finance and inequality is multidimensional: (i) finance concentrates wealth because the asymmetry of initial wealth and income distribution persists and amplifies generically due to increasing returns (fixed costs of acquiring human capital and fixed costs of starting businesses together with collateral requirements for bank credit) and unequal opportunities in financial and labour markets in the presence of market and contractual incompleteness. Unequal returns to assets and income structures leads to resource flows towards assets held by the rich thus reinforcing the skewed financial process (ii) incomplete participation increases wealth inequality and reduces the socio-economic mobility (iii) innovative methods in finance like micro credit (based on joint liability lending and peer monitoring) subject to conservative and honest methods can also potentially create wealth for significant proportion of the rural poor by financial and nonfinancial institutions operating in the rural world but may be thwarted by the burden of subsidy and of sustainability and by those pre-existing trading and financial intermediaries who tend to lost their business shares (iv) ideological tussle on whether the economic system should be oriented towards financial wealth accumulation at the expense of equally if not more reasonable social goals create divisions among individuals in the society. This leads to class structure tensions which lead to limited socio-economic mobility and excessive regulation and financial repression. This increases economic inequality directly (by limiting mobility) and indirectly (by excessive regulation of economic activities). Dynamic redistributive policies should be analyzed in these contexts. Policies like redistribution of assets, promotion of equality of opportunities, alignment of economic goals and proper incentives tend to create a dynamic path with less inequality and one that affords the luxury of other social and political objectives.

A last word on inequality is in order. Inequality may be reduced both through trickle down and trickle up processes associated with the cyclical growth process described above. A trickle down process acts as follows: as growth occurs, an increasing fraction of spending will be devoted to products made by the middle class and the poor in the rural as well as the urban areas enabling them to join higher levels of income (however this trickle down process maybe very time consuming). A trickle up process acts as follows: as growth occurs, low income workers may become successful (with some drive and ingenuity and with the aid of a community network) in migrating to higher paying jobs (with associated geographical migration) while high wage workers and managers may be able to start their own firms and become successful entrepreneurs (the first effect is more significant in the early days of development while the second effect is more significant after the economy matures and becomes accommodative of new ideas, ventures and technologies and as risk sharing increases throughout the economy). Liberalization of the economy increases the pace of trickle up and trickle down processes and reduce inequality. Therefore, an economy should be allowed to be liberalized carefully in a phased manner with prudential regulation dealing with possible distortions and excesses created by liberalization.

V. Conclusion

The firm is the driving force of the economy since the activities of the firms boost aggregate demand as well as aggregate supply but it is the performance of the financial system which facilitates or restricts the activities of the firms. Financial systems allocate resources from savers to investors and since these two groups have different liquidity-risk-return characteristics, financial institutions and financial markets have to issue securities and innovate to bridge the gap. The demand multiplier (together with the investment accelerator) and the credit cycle create a cyclic growth process which needs to be stabilized from context to context through rule based activist monetary policy and regulation when there are fiscal constraints. Inequality and imperfections of financial markets reinforce each other making policy innovations necessary but liberalization of the economy may go a long way in reducing inequality and poverty.

Bibliography

1. Allen, Franklin and Douglas Gale (1994) *Financial Innovation and Risk Sharing.* The MIT Press. Cambridge, Massachusetts, USA and London, England.
2. Allen, Franklin and Douglas Gale (2000) *Comparing Financial Systems.* The MIT Press. Cambridge, Massachusetts, USA and London, England.
3. Allen, Franklin and Douglas Gale (2007) *Understanding Financial Crises.* Oxford University Press.
4. Altug, Sumru and Pamela Labadie (2008) *Asset Pricing for Dynamic Economies*. Cambridge University Press.
5. Auerbach, Alan and Laurence Kotlikoff (1995) *Macroeconomics –An Integrated Approach. SOUTH-WESTERN College Publishing.*
6. Azariadis, Costas (1993) *Inter-temporal Macroeconomics.* Blackwell Publishers. Cambridge, Massachusetts, USA and Oxford, England.
7. Banerjee, Abhijit. V. and Andrew F. Newman (1993) "Occupational Choice and the Process of Development", *Journal of Political Economy* 101(2): 274-298.
8. Barro, Robert J. (1974) "Are Government Bonds Net Wealth?, *Journal of Political Economy* 82:1095-1118.
9. Basu, Kaushik (1984) *the Less Developed Economy: A Critique of Contemporary Theory.* Oxford: Blackwell.
10. Bernanke, Ben and Mark Gertler (1990) "Financial Fragility and Economic Performance", *Quarterly Journal of Economics* 105 (1): 87-114.
11. Bhattacharya, Sudipto, Arnoud W. A. Boot and Anjan V. Thakor ed. (2004) *Credit, Intermediation and the Macroeconomy.* Oxford University Press.
12. Blanchard, Olivier Jean and Stanley Fischer (1989) *Lectures on Macroeconomics.* The MIT Press. Cambridge, Massachusetts, USA and London, England.
13. Blinder, Alan and Robert Solow (1974) "Analytical Foundations of Fiscal Policy", in *the Economics of Finance.* Washington: Brookings Institution.
14. Boot, Arnoud W. A. and Anjan V. Thakor (1997) "Financial System Architecture", *Review of Financial Studies.* 10: 693-733.
15. Brock, William A. and Leonard J. Mirman (1972) "Optimal Economic Growth under Uncertainty: The Discounted Case", *Journal of Economic Theory* 4: 479-513.
16. Burmeister, Edwin (1980) *Capital Theory and Dynamics.* Cambridge University Press. Cambridge, England.
17. Cameron, Rondo (1972) *Banking and Development: Some Lessons of History.* New York: Oxford University Press.
18. Cass, David (1972) "On capital over-accumulation in the aggregative, neoclassical model of economic growth: a complete characterization", *Journal of Economic Theory* 4: 200-23.
19. Clark, Gordon (2000) *Pension Fund Capitalism.* Oxford University Press.
20. Cooper, Russell and Andrew John (1988) "Coordinating Coordination Failures in Keynesian Models", the *Quarterly Journal of Economics* 103 (3): 441-463.
21. Cottrell, Philip (1979) *Industrial Finance 1830-1914.* Thomson Litho, East Kilbride.
22. Danthine, Jean-Pierre and John B. Donaldson (2005) *Intermediate Financial Theory.* Elsevier Academic Press.
23. Dewatripont, Mathias and Jean Tirole (1994) *the Prudential Regulation of Banks.* The MIT Press. Cambridge, Massachusetts, USA and London, England.
24. Diamond, Peter (1965) "National Debt in a Neoclassical Growth Model", *American Economic Review* 55: 1126-1150.
25. Dornbusch, Rudiger and Stanley Fischer (1987) Macroeconomics. McGraw-Hill Book Co.
26. Duffie, Darrell (2005) *Dynamic Asset Pricing Theory.* Princeton University Press. Princeton and Oxford.
27. Eatwell, John., Murray Milgate and Peter Newman (1987) The New Palgrave: *Finance.* The Macmillan Press Limited.
28. Fabozzi, Frank J., Franco Modigliani and Michael G. Ferri (1998) *Foundations of Financial Markets and Institutions.* Prentice-Hall.
29. Fisher, Irving (1930) *the Theory of Interest.* New York: Macmillan.
30. Freixas, Xavier and Jean-Charles Rochet (1997) *Microeconomics of Banking.* The MIT Press. Cambridge, Massachusetts, USA and London, England.
31. Friedman, Milton and Anna Jacobson Schwartz (1963) *A Monetary History of the United States 1867-1960.* National Bureau of Economic Research.
32. Friedman, Milton (1956) Studies in the Quantity Theory of Money. Chicago: Chicago University Press.
33. Frisch, Ragnar (1933) "Propagation and Impulse Problems in Dynamic Economics" in *Economic Essays in Honor of Gustav Cassel*. London: Allen and Unwin, 171-205.
34. Gale, Douglas (1982) *Money: in Equilibrium.* Cambridge University Press. Cambridge, England.
35. Gale, Douglas (1983) *Money: in Disequilibrium.* Cambridge University Press. Cambridge and New York.
36. Geisst, Charles R. (1997) *Wall Street – A History.* Oxford University Press. New York and Oxford.

37. Gertler, Mark (1988) "Financial Structure and Aggregate Economic Activity: An Overview", *Journal of Money, Credit and Banking* 20 (3): 559-588.
38. Greenwood, Jeremy and Boyan Jovanovic (1990) "Financial Development, Growth and the Distribution of Income", *Journal of Political Economy* 98: 1076-1107
39. Hahn, Frank H. (1965) "On some Problems of the proving the Existence of an Equilibrium in a Monetary Economy" in F. H. Hahn and F. P. R Brechling (eds) The Theory of Interest Rates (1965) 126-135.
40. Hahn, Frank H. (1984) *Equilibrium and Macroeconomics.* The MIT Press Cambridge, Massachusetts, USA.
41. Hansen, Alvin. H. And Richard V. Clemence eds. (1953) *Readings in Business Cycles and National Income*. George Allan & Unwin Ltd.
42. Hart, Oliver (1995) *Firms, Contracts and Financial Structure.* Oxford University Press.
43. Hawtrey, Ralph. G. (1927) *Currency and Credit.* London.
44. Hayek, Friedrich (1935) *Prices and Production.* London: G. Routledge..
45. Herrick, Bruce and Charles P. Kindleberger (1983) *Economic Development.* McGraw-Hill International Book Company.
46. Hicks, John (1939) *Value and Capital: An Inquiry into Some Fundamental Principles of Economic Theory.* The English Language Book Society and Oxford University Press.
47. Hicks, John (1989). *A Market Theory of Money.* Oxford University Press.
48. Hunter, William C., George G. Kaufman and Michael Pomerleano ed. (2003) *Asset Price Bubbles: The Implications for Monetary, Regulatory and International Policies.* The MIT Press. Cambridge, Massachusetts, USA and London, England.
49. Huang, Chi-fu and Robert H. Litzenberger (1988) *Foundations for Financial Economics.* Amsterdam: North-Holland.
50. Jevons, William. S. (1884) *Investigations in Currency and Finance*. Macmillan and Co.
51. Keynes, John Maynard (1936) *The General Theory of Employment, Interest and Money.* London: Harcourt Brace.
52. Kindleberger, Charles. P. (1993) *A Financial History of Western Europe.* Oxford University Press.
53. Kuznets (1955) "Economic Growth and Income Inequality", *American Economic Review* 45: 1-28.
54. Kydland, Finn and Edward C. Prescott (1982) "Time to Build and Aggregate Fluctuations", *Econometrica* 50 (6): 1345–1370.
55. Laffont, Jean-Jacques and David Martimort (2006) The Theory of Incentives. Princeton University Press.
56. Lucas, Robert E. (1987) *Models of Business Cycles.* Basil Blackwell.
57. Lucas, Robert E. (2003) *Lectures on Economic Growth.* Oxford University Press.
58. Mallick, Indrajit (2020) *Financial Structure, Economic Dynamics and Prudential Regulation*. Unpublished Manuscript.
59. Marshall, Alfred (1923) *Money, Credit and Commerce.* London: Macmillan.
60. Marx, Karl (1867) *Capital. A Critique of Political Economy*. Translated from the Third German Edition by Samuel Moore and Edward Aveling and edited by Frederick Engels. Revised and amplified according to the fourth German edition by Ernest Untermann. Chicago: Charles H. Kerr, 1918.
61. Mas-Colell, Andreu, Michael D. Whinston and Jerry R. Green (1995) *Microeconomic Theory.* Oxford University Press.
62. Michie, Ranald C. (1999) *The London Stock Exchange – A History.* Oxford University Press.
63. Milgrom, Paul and John Roberts (1992) *Economics, Organization and Management.* Prentice Hall.
64. Mill, John. S. (1848) *Principles of Political Economy with Some of their Applications to Social Philosophy*. London; John W. Parker.
65. Mishkin, Frederic. S. (2010) *The Economics of Money, Banking and Financial Markets.* Pearson, Second Edition.
66. Modigliani, Franco (2011) *The Debate over Stabilization Policy.* Cambridge University Press.
67. Patinkin, Don (1965) *Money, Interest and Prices.* New York: Harper and Row.
68. Pigou, Arthur. C. (1912) *Wealth and Welfare.* Macmillan and Co.
69. Piketty, Thomas (1997) "The Dynamics of the Wealth Distribution and the Interest Rate with Credit Rationing", *Review of Economic Studies*, 64: 173-189.
70. Piketty, Thomas Translated by Arthur Goldhammer. (2014) *Capital in the Twenty-First Century.* The Belknap Press of Harvard University Press.Cambridge, Massachusetts and London, England.
71. Ray, Debraj (1999) *Development Economics*. Oxford University Press.
72. Ricardo, David (1846) "On the Principles of Political Economy and Taxation" In J. McCulloch (ed.), *The Works of David Ricardo.* London: John Murray.
73. Robertson, Dennis. H. (1922) *Money.* New York: Harcourt Brace and Company.
74. Romer, Paul M. (1986) "Increasing Returns and Long-Run Growth", Journal of Political Economy 94 1002-1037.
75. Ross, Sheldon M. (2003) *An Elementary Introduction to Mathematical Finance.* Cambridge University Press. Cambridge UK.

76. Samuelson, Paul. A. (1947) *Foundations of Economic Analysis*, Harvard University Press
77. Samuelson, Paul (1958) "An Exact Consumption-Loan Model of Interest with or without the Social Contrivance of Money", *Journal of Political Economy* 66: 467-482.
78. Sargent, Thomas J. (1987) *Dynamic Macroeconomic Theory.* Harvard University Press. Cambridge, Massachusetts, USA and London, England.
79. Sayers, Richard Sidney (1967) *Modern Banking.* Clarendon Press.
80. Sen, Amartya K. (1982) *Choice, Welfare and Measurement.* Oxford University Press.
81. Sen, Amartya K. (1985) *Commodities and Capabilities.* Amsterdam: North-Holland.
82. Sidrauski, Miguel (1967) "Rational Choice and Patterns of Growth in a Monetary Economy", *American Economic Review 57*: 534-544.
83. Smith, Adam (1776) *An Enquiry into the Nature and Causes of the Wealth of Nations*. Gen eds, R.H. Campbell and A. S. Skinner. Oxford: Clarendon Press.
84. Solow, Robert (1970) *Growth Theory – An Exposition.* Oxford University Press.
85. Stiglitz, Joseph (1969) "Distribution Income and Wealth among Individuals", *Econometrica* 37(3) 382-397.
86. Stokey, Nancy L., and Robert E. Lucas Jr. with Edward C. Prescott (1989) *Recursive Methods in Economic Dynamics.* Harvard University Press. Cambridge, Massachusetts, USA and London, England.
87. Thakor, Anjan V. and Arnoud W. A. Boot ed. (2008) *Handbook of Financial Intermediation and Banking.* North-Holland, Elsevier
88. Tinbergen, Jan (1952) *On the Theory of Economic Policy.* Amsterdam: Elsevier.
89. Tirole, Jean (2006) *The Theory of Corporate Finance.* Princeton University Press.
90. Tobin, James (1958) "Liquidity Preference as Behaviour towards Risk". *Review of Economic Studies,* 25 (2), 65-86.
91. Tobin, James (1965) "Money and Economic Growth", *Econometrica,* 32:671-684.
92. Tobin, James (1980) *Asset Accumulation and Economic Activity*. Oxford: Basil Blackwell
93. Viscusi, W. Kip, Joseph E. Harrington, Jr. And John M. Vernon (2005) *Economics of Regulation and Antitrust.* The MIT Press. Cambridge, Massachusetts, USA and London, England.
94. Wallace, Neil (1981) "A Modigliani-Miller Theorem for Open Market Operations", 71: 267-274.
95. Wicksell, Knut (1936) *Interest and Prices. (Geldzins and Guterpreise) A Study of the Causes Regulating the Value of Money*. London: Macmillan for the Royal Economic Society.
96. Woodford, Michael (2016) "Quantitative Easing and Financial Stability", *NBER Working Papers 22285* National Bureau of Economic Research, Inc.