Introduction: The Financial Fragility Hypothesis: the offspring of 'Induced Investment and Business Cycles'

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For more than four decades Hyman Minsky had painstakingly worked in the areas of economics and finance and in his many writings tried with vision and clarity to find a rational way to link the two. His research program has provided a definitive analysis of the linkage. As most students of his work would argue, he began with Keynes' concern with the volatility of investments, and then recognized how serious the uncertainty of cash flows from investments was since it could lead to serious repercussions on the balance sheets of firms. This, in turn, requires the government to intervene to reduce the systemic risks this process engenders by changing its fiscal and/or monetary stance to prevent a debt deflation. '[T]o Minsky a sequence of booms, government intervention to prevent debt contraction, and new booms entails a progressive build-up of new debt, eventually leaving the economy much more fragile financially' (Kaufman 1992, p. vii).

'Cash flow' to a firm, the buzzword in almost all his writings – but nowhere to be found in the neoclassical paradigm, was nevertheless crucially important in performing many functions including (1) signaling whether investments undertaken were based on sound decisions, (2) providing the funds needed by the firm to fulfill payments when due and (3) assisting in the decision-making process for future investment financial conditions (Minsky 1982, p. xvii). An analysis of cash flows documents a firm's performance by providing a connection between its ability to make payments on its debts with its cash revenues from operations. When this connection is taken in the aggregate for all business units, it determines the economic system's performance, that is 'the course of investment and thus employment, output, and profits' (Minsky 1982, p. xvii). Minsky was able to show that the observed behavior of a capitalist economy provided ample evidence that there exists an inherent instability (financial fragility) which is the result of two intervening factors: the complexity of market relations and the balance sheet adventuring of business firms. Thus investment decisions – aside from

Keynes' concern for volatility – involve complex financial relations between liability structures, committing cash flows that are (must be) generated from production and distribution of output.

It has been suggested that Minsky's development of the financial fragility hypothesis is a direct descendant of the ideas he has put forward in his doctoral thesis (Delli Gatti and Gallegati 1997). 'Induced Investment and Business Cycles' is Hyman Minsky's doctoral thesis which was supposed to be supervised by Schumpeter, but because of Schumpeter's untimely death, was completed under the supervision of Wassily Leontief. The original topic of his thesis was to explore the relations of market structure, banking, the determinants of aggregate demand, and business cycle performance (Papadimitriou 1992). The topic was set to be a macroeconomic inquiry entailing the workings of macro forces of markets and aggregate demand and how the volatility of demand leads to economic fluctuations. The dissertation that makes up this book is instead a microeconomic analysis of firm behavior encompassing the various decision-making processes regarding entry, market structure, expansion, vulnerability and survival. A firm's financing relations affecting each and every stage of the firm's development are dependent on its capacity to honor obligations in meeting commitments made today with cash flows received in the future which in their turn are dependent on the impact the business cycle has on the firm. Thus, the linkage of business investment with finance is developed in the microeconomic sphere, extending the conventional neoclassical theory of the firm. Minsky considered his approach in the dissertation to be the microfoundation for determining macro performance.

It should be understood that Harvard, where Minsky undertook graduate study, had not been as much of an influence on him as his undergraduate years at the University of Chicago. His recollections were of disappointment as topics discussed were treated in rather a mechanistic manner and also in a most unstructured fashion. '[Alvin] Hansen, the leading disciple of Keynes in America, interpreted Keynes . . . [by] virtually ignoring the significance of money and finance. Furthermore, uncertainty, which was fundamental in Keynes' understanding of the capitalist economy, was left out' (Papadimitriou 1992, p. 18). These are very important issues for Minsky and are discussed extensively in the dissertation and his subsequent research writings that span more than four decades.

Minsky describes the objective of his dissertation as the formulation of a model of particular product markets that will establish the foundation of aggregate analysis, enabling him to consider a number of public policies that are relevant to crafting an effective business cycle theory (p. 1). In so doing, he proceeds to review in the most significant detail the contributions of Paul Samuelson (1939), J.R. Hicks (1950), Wesley Mitchell (1950) and

Richard Goodwin (1951), at the time, the prevailing versions of the multiplier-accelerator model of business cycle analysis. To Hyman Minsky a satisfactory business cycle theory 'has to analyze both the interrelations among a few broad aggregates' (relating to monetary theory) and 'the behavior of individual economic units and of particular markets' (p. 1). Exogenous variables are not adequately explained in the basic structure of the linear versions (Samuelson and Hicks interpretations) of the multiplier-accelerator model and are of no real use in analysing decision-making processes that involve individual units. Minsky rejects the validity of these models and also critiques Hicks' non-linear version of 'floors and ceilings' since its parameters of 'the ceiling of full employment' and the floor at the 'level of income consistent with the maximum rate of capital consumption' (p. 8) are non-economically determined. 'What link is there between the interrelations among the variables of the model and the parameters in the Hicks floors and ceilings?' (p. 9). Minsky insists on the notion that the 'dominant factor in economic life is the interdependence of economic units and agents' (p. 12). Thus, because of its structure, the Hicksian model cannot determine the relevant factors influencing the behavior of its coefficients. The *a priori* determined coefficients α and β yield a particular level of national income and not the time path of national income the non-predetermined α, β coefficients would do (p. 17).

Furthermore, the Hicks version assumes away the effects of financial relations of non-homogeneous agents and the implications they have for investment that when taken into account would generate a model of non-linear structure closer (yet far from being adequate) to that described by Goodwin. What would be valuable, therefore, is to analyse the determinants of the value of the accelerator coefficient and thus, complete the Hicks and Goodwin models that in their present form do not explain the systematic variation of the accelerator (p. 41). These 'revised' non-linear models would posit that the value of the accelerator coefficient β be dependent on money market conditions and the balance sheets of firms, and that these factors, in their turn, be dependent on the relation between the level and the rate of change of income and the behavior of the monetary system (Minsky 1982, p. 233). Then such models could be capable of being instruments for (1) accurately describing the track of the American economy and (2) for providing alternate fiscal policy evaluations other than either 'secular stagnation' or 'continuing inflation' (p. 77). At the level of a firm, it would mean determining the 'generating relation' of its investment function that results from changes in income and 'the structure of [its] balance sheet [that] will reflect the psychological attitude toward risk taking' (p. 162). This is the Minskyan interpretation of Keynes' concept of 'induced' investment demand. In Minsky's own words,

it is 'all investment which occurs because the variables which enter the investment decision function are altered by market changes associated with changes in income' (p. 135), and by extension, any changes of investment would be the cause of business cycles. Market changes include both changes in market structure and the incipient interaction of non-homogeneous firms that lead to altering investment. To Minsky, therefore, the distribution between autonomous and induced investment may be brought into question since it 'may be meaningless' and that 'all investment is induced' (pp. 135–6).

The Minskyan model of the business cycle establishes the accelerator coefficient to be pro-cyclical. It reflects 'the relation between the value of the accelerator coefficient and the structure of the markets, and the relation between the value of the accelerator coefficient and the behavior of financial markets' (p. 136). The firm's cost structure – Minsky represents it by meticulously drawn cost curves in many places in the book – is affected by both conditions (1) and (2) operating through wages as these change from fluctuations in employment and the degree of investment activity. The firm's cost curves are met by those representing demand. As market conditions vary, market structure determines individual product demand curves that shift reflecting '(1) the relation between the particular demand curve confronting the firm and the market demand curve, and (2) the way in which a firm behaves toward its particular demand curve' (p. 137). This follows more in the realm of Chamberlin's *The Theory of Monopolistic Competition* (1933) rather than Robinson's *Theory of Imperfect Competition* (1933) since Chamberlin includes the demand confronting the firm operating in non-competitive markets. Minsky's representative firm can fulfill the Schumpeterian characterization (Delli Gatti and Gallegati 1997, p. 529), in which if it possesses market power and has substantial capacity to produce with the existing plant, it will not destroy old technology unless internal and external competition encourage a 'creative destruction'. However, Minsky is careful to note that positions of previously created capital must be financed; non-depreciated capital values involve liabilities that must be absorbed and losses incurred. The willingness and ability of a firm to absorb such losses depend on current and future cash flows and balance sheets positions that are a function of past, present and future demand. As market structure changes through time, so do the financing conditions of a firm dictated by its particular balance sheet structure that determines the degree of its vulnerability and ultimately its survival. Investible funds can be obtained from three sources: retained earnings, credit and equity capital which, along with their uses, describe the structure of the firm's balance sheet (Tsiang 1951, pp. 332–3).

The firm's capacity to overcome adverse market changes derived from the stream of income flows establishes its vulnerability and survival constraints (pp. 157–8). This problem 'the usual economic theory ignores . . . and assumes a unique behavior principle for all firms [that is] profit maximization' (p. 143). However, exceeding the survival constraint will bankrupt the firm that exits the market while another firm enters, both events being sources of non-linearity affecting the value of the accelerator coefficient during the business cycle. In the case of entry of a new firm the condition that satisfies it is 'when it possesses some advantages of market position which results in the rate of return . . . greater than the rate of return generally available in the economy' (p. 254). What distinguishes Minsky's treatment of the business cycle from the traditional theory is the determination of the investment accelerator coefficient by not only the stylized facts of the income-demand interaction, but also the effects of a firm's financing conditions that inform its behavior and the behavior of money markets. This distinction is undoubtedly the origin of Minsky's *financial fragility hypothesis* for which most of his lifetime intellectual endeavors were devoted.

The world of efficient markets operates under the conditions of competition, perfect information and no financing constraints. Indeed, the well-known Modigliani-Miller theorem that reigns supreme in neoclassical economics insists that markets behave in such manner. In Minsky's world, however, starting with this book, markets are inefficient since agents are not operating in a competitive environment and most relevant information is private. Balance sheets reflect information of non-homogeneous firms and changes in them pose new constraints that take place over time and are directly related to business fluctuations.

Minsky identifies the following financial constraints to firms that engage in investment activity especially during an economic expansion: 'a) the difficulty of new firms . . . to achieve a sufficient equity base; b) the impact upon a firm of a greater tightening of financing terms, due to the imperfect elasticity of the supply of credit; c) that the rate of expansion of capital implied by the accelerator model may imply that the firm's financing condition must deteriorate' (p. 118). All three constraints listed explicitly state that balance sheet positions matter. Moreover, if firms during the course of the business cycle use their retained earnings to expand capacity (build a new plant), then this leads to a higher equity and lowered debt position, an improvement in the balance sheets positions affecting the accelerator coefficient positively. If, on the other hand, firms use their earnings to pay down their debt, this decreases their equity position and may ultimately increase debt, deteriorating the balance sheet positions and affecting the accelerator coefficient negatively (Delli Gatti and Gallegati 1997, p. 531).

Both positive and negative affects on the accelerator coefficient become pro-cyclical and may lead to the deterioration of credit terms for new loans should financial relations change thus, exacerbating the turning points of the business cycle.

As investment decisions are a function of financial conditions reflected in balance sheet structure and projections of cash flows, a firm's survival constraint becomes a serious matter. 'If we begin at any date we have that at each and every future date, in order to survive, the firm must satisfy the condition that the initial cash plus receipts minus the costs payable to that date are greater than zero' (p. 158). To avoid bankruptcy, the firm's cash flows from the sale of output must be greater than production costs and debt service commitments. 'The debts of a firm reflect the conditions that existed in the relevant financial markets at the date the debts were assumed. The survival conditions therefore are measures of the effects that financial and money market conditions have upon the behavior of firms' (p. 202). In this respect, the constraints of survival can be viewed as those of liquidity and solvency. Liquidity is the ability to meet cash commitments (it is hindered when financial conditions are altered and current or expected profit flows decline so that the liquid capital of the firm's proximate owners or producers is used up (Minsky 1982, p. 72)). Solvency is the ability to maintain some level of net worth (to avoid bankruptcy and exit the market). The firm's entry into and exit from the market are processes that are connected with liquidity and solvency and the risk of surviving is differentiated by the balance sheet position (p. 202). Firms can be classified then on the basis of vulnerability and survival into the following categories: 'wholly owned' firms and firms with 'a large volume of debt' reflecting large differences in liability structures (p. 159). The financial profiles of firms that are differentiated by their respective relations between contractual payment commitments due to their liabilities and cash flows defined as hedge, speculative and 'Ponzi', distinctions developed much later in Minsky, find their roots here.

Minsky concludes that 'the financing of a firm's expansion may result in a deterioration of its survival conditions. Therefore the liquidity crises of the downswing can be imputed to the development of the expansion. Business cycles are both monetary and real phenomena' (p. 345).

This in a nutshell is Minsky's version of a business cycle theory. When the cycle is moving toward its peak firms become more vulnerable and their balance sheet positions deteriorate, decreasing their net worth. This may result in a number of firms not surviving and thus leaving the market. Profit and income fall cumulatively until a lower point of the cycle is reached. The lower point gives the opportunity for monopoly power to rise because there are fewer firms remaining in the market with a lesser degree

of vulnerability. Concurrently, individual demands shift, culminating in higher profits and improving balance sheet positions. A cumulative expansion begins engendering cyclical fluctuations.[1]

Reading Minsky's thesis in the pages that follow, a case can be made for the connections that it draws from the works of Henry Simons (1936) – the notion of the importance of the state of industrial organization; from Michal Kalecki (1937) – the linkage of profit flows to investment, in that profits become both the lure for new investment and the result of realized investment; from Schumpeter (1939) – the importance of market structure and its effects on innovative investment; and most absolutely from John Maynard Keynes.

Minsky's financial fragility hypothesis – whose relevance to the post World War II economic downturns is unquestioned – was first conceived in his dissertation and developed more fully in later years. It is a theory of business cycles connecting financial conditions of firms and markets to investment and in which coordination failures exist. Years later, Minsky (1975, 1982, 1986) articulates a theory of investment combining finance and income determination. The carefully developed 'financial fragility' inherent in advanced capitalism is based on a two price system. One is the price level of current output, and the other, the price level of financial and real assets. These two prices are determined from different relations and variables. The price of current output is the device through which production and distribution occur and costs are recovered. The price of capital and financial assets reflects uncertainty and is dependent on yields. Since yields represent streams of income over time, their current prices must reflect the current valuations of incomes that will be realized over time. An increasing divergence of the two price levels in the macroeconomy engenders instability and ultimately a business cycle ensues (Papadimitriou 1992). Market imperfections played an important role in the dissertation (chapters 4 and 7 especially), but they were not much discussed in later writings.

The Minskyan analysis of the business cycle is a new but fundamentally Keynesian species that links economics and finance. Although quite different from the standard theory, it still lies within the mainstream economic paradigm. Minsky's dissertation is an important contribution to the literature on business cycles and a reminder that efforts grown in the tradition of non-standard theory do not always remain unappreciated.

NOTE

1. This paragraph is to some extent a restatement of Delli Gatti and Gallegati (1997), 531–2.

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