Introduction: ‘Things fall apart, the centre cannot hold’

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Hyman P. Minsky’s economic writings are centred around three interrelated topics:

1. An interpretation of Keynes, stressing the most innovative and revolutionary features of his monetary thought: the essential role of financial markets, the non-neutrality of money, the systematic uncertainty and bounded rationality surrounding decision-making, the cyclical nature of the capitalist process due to the fluctuation in private investment. Minsky extends Keynes, putting together an investment theory of the business cycle with a financial theory of investment. The ‘two-price’ model and Minsky’s reference to Kalecki’s view about the determination of profits belong here.
2. The financial instability hypothesis, according to which, after a period of ‘tranquil’ growth and ‘robust’ finance, firms’ and banks’ liability structures spontaneously shift towards fragility. The economic system is prone to financial crises, which actually break out as a consequence of the normal functioning of a capitalist economy. Minsky’s view is that each state of the economy is transitory: internal financial developments compel a transition to the next state. Capitalist cyclical evolution – from expansion to boom, financial collapse and the risk of debt deflation, possibly leading to great depression – is, once again, the necessary outcome of the monetary nature of the capitalist process at the heart of Keynes’s approach. What is lacking in the *General Theory* is a clear understanding of why stability is destabilizing: for Minsky, capitalist evolution is endogenous, and is driven by the behaviour of financial variables. This is probably the most original side of Minsky’s legacy.
3. The policy implication is that discretionary intervention from the government and the central bank can mitigate capitalist instability, creating ceilings and floors constraining the dynamic behaviour of the system. Government budget deficits and the central bank, both as lender of last resort and as regulator of financial practices, help monitor the develop-

ment of liability structures in the economy, and may stop a downward trend in money profits, which are the key variable for debt validation and for capital asset prices. Economic policy can do better than simply make systemic fragility less pronounced. A change in the nature of big government may encourage resource creation and the expansion of output, and may attain the goal of full employment in a system of decentralized decisions and in a non-inflationary environment. Minsky's answer to the flaws marring both the capitalism of the 1920s and 1930s, which ended in the Great Crash, and the capitalism of the 1960s and 1970s, which ended in stagflation, is made up of a thorough socialization of investment and restructuring of government expenditure together with a reform of the banking and financial system.

These themes are recurrent, with different weight, in the three books Minsky wrote (Minsky, 1975, 1982, 1986a; cf. also Minsky, 1996), which all pursue the same aim, the construction of a financial Keynesianism. Keynes is the giant on whose shoulders Minsky stands in order to advance his novel vision; he is the constant reference in the theoretical reconstruction of a capitalist economy with a stratified financial system and with endogenous money.

Nevertheless, the stress is clearly different in the three books. The goal in *John Maynard Keynes* is to reinstate money, finance and the cycle at the centre of the economics of Keynes, breaking away from the 'bastard' Keynesianism of the neoclassical synthesis. *Can "It" Happen Again?* goes well beyond the controversy over the interpretation of Keynes: the question here is rather to show that the financial instability hypothesis provides a valid picture of the internal dynamics of the capitalism of the twentieth century. Minsky's reading and extension of Keynes must explain both the Great Depression of the 1930s and the fact that a deep and long-lasting depression didn't happen again. The new approach accounts for the fundamental upward instability, as well as for the necessary reversal of the process leading to the risk of debt deflation and to mass unemployment. The peak and trough of the cycle are mainly due to the interaction between changes within the financial structure of the economy and economic policy intervention. In *Stabilizing an Unstable Economy*, Minsky's constant concern for the institutional differences delineating various models of capitalism gives way to a full-blown 'agenda for reform' of present-day capitalism. This includes suggestions for the creation of new ceilings and floors constraining the contemporary form of capitalist instability and for the achievement of a full employment target.

In what follows, we shall first propose a survey of the essential core of Minsky's train of thought (for other surveys, to which we are indebted, the reader may consult Dymski and Pollin 1992 and Papadimitriou and Wray, 1998; Fazzari and Papadimitriou, 1992 and Dymski and Pollin, 1994 are also

useful collections in the Minsky tradition). We shall then make a few comments on the legacy Minsky left to us as political economists. Finally, we shall present the contributions included in this collection.

A MONETARY DISSENTING ECONOMIST

The ‘world we live in’ is a capitalist economy with expensive and long-lived capital assets and with a complex financial structure. In this context, ‘equilibrium’ is affected by the value of nominal variables and by the historical record of the economy: any theoretical view that leaves out these points cannot but be false and useless. Minsky’s criticism is levelled, of course, against both neoclassical and Keynesian orthodoxies; but it can also be directed to those non-traditional perspectives where money and finance are not introduced at the ground floor of the theoretical building. The fundamental sequence in the capitalist economy is monetary: indeed, capitalism may be accurately defined as a production of money by means of money. Hence a ‘good’ model for capitalism must include from the start:

- a. banks, which create money;
- b. firms, which finance production and positions in capital assets thanks to bank loans;
- c. households, which hold the financial instruments created or placed by banks to finance investment and positions in capital assets.

Some of the terms we have just introduced – namely, ‘banks’ and ‘money’ – have no unique reference in Minsky, and their meaning may change over the course of time. ‘Banks’ sometimes refers to commercial banks strictly defined, sometimes to all financial institutions providing finance. ‘Money’ is sometimes defined as the sum of high-powered money and demand deposits (or, generically, banks’ liabilities), sometimes as what effectively counts as money, including financial intermediaries’ liabilities. And so on. For the time being, we limit ourselves to a couple of definitions which may be useful in what follows. ‘Positions’ are those assets in portfolios or in balance sheets which cannot be converted readily into cash; the ‘position-making assets’ are the instruments used to acquire the cash needed to finance the buying of positions.

Standard economic theory adopts a ‘village-fair’ paradigm. A barter, pure-exchange economy is its starting-point, to which production, money, capital and financial assets are added to get a more realistic description. On this view, the central features of a capitalist economy are accurately grasped in a basic model without money and production. Minsky’s vision is the opposite. His ‘City’ or ‘Wall Street’ paradigm begins with the picture of a money

economy with sophisticated financial institutions. Minsky's approach develops from the dynamics of cash flows (wages and salaries to consumers, sale proceeds to firms, payment commitments to banks, and so on) and the interdependence among balance sheets (the financial instruments financing production, investment and positions correspond to assets of some units and liabilities of others: double-entry bookkeeping implies that each operation is matched by another one, that is equal and opposite, in the same balance sheet). Financing production and investment, as well as making positions, is affected by expectations about an uncertain future; these choices will be validated or not by outcomes in historical, and hence irreversible, time. In such an economy, the intrinsic connection between finance and production commits agents to past decisions, and makes present behaviour dependent on monetary dynamics. Minsky's perspective is a full-blown theoretical alternative to standard economic theory in the way it incorporates:

- a. money into finance;
- b. finance into distribution;
- c. the determination of total gross profits, and of the level and composition of aggregate demand into relative price-setting.

On this view, the tendency towards equilibrium cannot but be regularly overcome by the internal drive towards morphological change.

MONEY AND FINANCE

Minsky's basic model refers to a closed, small-government economy and where capital accumulation entails issuing debt. In a capitalist economy finance is needed to produce current output, to buy new capital goods, and, more generally, to own capital assets. Finance to production, including the production of investments goods, is short-term. Positions in capital assets require long-term finance; as a rule, this latter is a combination of internal and external funds. Banks, strictly defined, are the providers of short-term finance. Positions in capital assets may also be financed by other intermediaries, or directly by savers, through instruments whose liquidity is subject to their convertibility into bank money. Against this background, it is clear why Minsky defines money as a bond, injected into the economy to finance production, investment, and positions in capital assets.

Thus money cannot be reduced either to a medium of exchange easing transactions, as in the quantity theory of money, or to liquid balances acting as store of value, as in traditional Keynesianism. Money is first of all a means of finance providing agents with purchasing power in an economy where:

- a. the key element in the economic process, that is investment, is carried out in unidirectional calendar time;
- b. businesses and financiers take their decisions and ‘make positions’ in a radically uncertain environment, with no scientific basis to calculate probabilities of future events;
- c. the performance of the economy hangs on the fulfilment of financial commitments, not only on the validation of expectations about income production;
- d. liability structures may have positive or negative feedback about banks’ and firms’ expectations.

The borrower receives money today in exchange for promises to pay money in the future. The use of initial money capital is more or less known in advance, and it is expected to allow the repayment of the debt and to leave a surplus. The lender gives up a certain command over current income for a future and uncertain stream of money. Borrowing and lending are based on margins of safety, which are safeguards against illiquidity. Though banks, in Minsky’s view, are definitely not lenders, since they do not give up command over income – Minsky always used to say that to be a lender you’ve got to have money; banks don’t have money, rather they create it – a similar approach can be adapted to cover banks’ demand for and supply of finance (Dow and Earl, 1982, pp. 138–42). In bank loans to firms the fundamental margin of security is the expected difference between gross earnings and out-of-pocket costs – namely, quasi-rents or gross profits. Bank lending to firms depends on the evaluation of the former about the future income statement of the latter. Expectations about future gross profits are what induce the granting of bank loans to firms; the actual realization of gross profits leads to their validation and gives way to the rolling-over of maturing debt. While external finance is the necessary premise to start production, usually it also lies behind the holding of illiquid assets promising quasi-rents. In general, external finance is raised on the expectation of cash *inflows* higher than cash *outflows* in the relevant time horizon. Payments due on financial instruments include the contractual commitment to pay interest and repay the debt as well as the moral commitment to pay dividends on equity shares. Current cash outflows spring from the financial structure of the business, which in its turn is the outcome of the past: today’s financial contracts will produce dated cash-payment commitments.

Hence the financial structure is both the result and the determinant of the time path experienced by the economy. What matters most are the confirmation of expectations about future returns, the dynamics of the short- and long-term rate of interest and the possibility of refinancing. If the anticipation of the difference between cash inflows and outflows or of access to new

borrowings turns out to have been too confident, the unit may be compelled to ‘make positions by selling positions’ – namely, selling out assets at any price on the market. To avoid this, the main ‘insurance’ is given by holding cash balances, or other very liquid stores of value: that’s why agents (not only households, but also firms and banks) have a positive and variable liquidity preference. Holding money is the barometer of our anxiety about the economy, it measures the lack of confidence in our estimates about the future of assets. Margins of safety other than the ratio cash inflow/cash outflow are the ratios equity/debt and assets/liquidity.

It should be clear by now why Minsky builds up his analytical scaffolding in terms of cash flows and balance sheets. They are two sides of the same coin. Minsky is a nominalist, in that he sees banks, firms and speculators as agents which, first of all, are dealing in money. Each economic unit is a money-in–money-out device: it must estimate the monetary receipts from its assets, deduct the financial commitments of holding positions, and assess their liquidity. All units are like a bank: they have to speculate on assets and liabilities, and they finance with short-term liabilities the ownership and control of longer-term, illiquid and risky, assets – the more so the more capitalistic the economy. When expected receipts go up and/or anticipated risks decrease, it is rational to reduce cash balances and to ‘lengthen’ balance sheets, increasing the share of less liquid assets in portfolios. Liability structures are based on the bet that future events will allow the unit to fulfil its cash commitment. Not only is the bet uncertain; the same guesses about the bet are influenced by the real and financial changes affecting the structure of the economy.

Before entering into the details of Minsky’s monetary view of the capitalist process, we should stress an important corollary of his approach about the nature of money (Minsky, 1957a and 1991; cf. also Nasica, 1997 and Wray, 1992). We have already recalled that in Minsky there is a ‘strict’ definition of the money supply, given by the sum of high-powered money and demand deposits. Commercial banks’ credit potential, however, is not a given multiple of high-powered money, but has room for variation. So a restrictive monetary policy, because of fears of inflation in growth or boom, may determine a rise in short-term rates of interest, which in its turn forces an active reaction on the part of banks. A higher short-term rate of interest means a higher opportunity cost of reserves. To maximize profits, banks make a more efficient use of their lending potential, and push for an increase in loans. A given amount of reserves supports more bank loans and demand deposits. At the same time, we know that for Minsky finance can be embodied in financial instruments other than money strictly defined. As commercial banks, so also financial intermediaries are profit-seeking agents, which constantly try to extend credits, financing new positions. Financial innovation is strengthened

by the new restrictive policy of the central bank with its effects on the rate of interest: financial intermediaries issue new kinds of financial instruments which, as long as the market judges them 'liquid', serve as 'effective' money without increasing required reserves. A given amount of bank loans and demand deposits supports a higher volume of finance to the whole economy.

During 'tranquil' growth, and increasingly with the euphoric expectations typical of the boom, the creation of near-monies – that is, financial instruments which are good temporary 'substitutes' for money, able to meet both the demand for insurance and the demand for financing – speeds up (for example Minsky, 1957a; Rousseas, 1960). The 'effective' quantity of money soars. With the demand for finance pressing on supply, or with the central bank trying to impose control on some monetary aggregate, the short-term rate of interest rises. As a consequence, innovations in the means of payment and in financial practices gain ground, and the velocity of money increases. The pyramid of a growing financial system is erected on the foundation given by the 'monetary' system narrowly defined. The banking system, however, remains the pillar of this building: banks have in the end to *accept* these substitutes for money proper; and the very stability of the financial system rests on the stability of the banking system. Anybody may issue money, according to Minsky: the real problem is having it accepted by the public; and acceptance is warranted by commercial banks and, in the last resort, by the central bank. Throughout growth and boom the non-identity between near-monies and money fades away; it comes to the fore again when crisis erupts.

Thus the money supply is not 'given' once and for all: the definition, and the magnitude, change during the cycle. Though the effective quantity of money in circulation is demand-driven, it is *not* unbounded. The money supply is positively related to the rate of interest with a given financial structure; but it shifts to the right when banks and financial intermediaries squeeze inactive money and issue new substitutes for money, reacting to monetary policy or just exploiting profit opportunities during the cycle. Because of these changes, money supply becomes infinitely elastic for a while. The resultant interest rate–'effective' money supply relation is a step function. The endogenous nature of (either 'strict' or 'effective') money supply is strengthened by the fact that in prosperity economic units lower their margins of safety, and their liability structures embody a higher degree of risk. In a complex financial system, investment may be financed through portfolio adjustment, reducing balance sheets' liquidity.

Minsky's approach to money brings with it other original features. First of all, banks select financing deals, and cannot be assumed to be passive *vis-à-vis* firms' demand for loans. Bankers, in a sense, guarantee society on the probability of a positive difference between cash inflows and payment commit-

ments. Banks' liabilities are 'believable' and accepted (and government-backed), and so the risk of a 'run' is avoided, so long as there is general trust in agreements between banks and firms, and in prudent portfolio diversification by banks. Banks' ability to select potential borrowers depends on the former's skill in collecting the information needed to evaluate the latter's solvency. Second, since the stability of the banking system is the cornerstone of the stability of the financial system, the central bank must have as its main target the protection of both. The lender-of-last-resort function of the bank of issue is justified by the pivotal role of banks relative to other financial intermediaries, and by the impossibility of reducing money to a specific set of debts. Finally, not only expansionary, but also restrictive monetary policy is often ineffective, and even self-defeating. Early Minsky does not deny that sooner or later the central bank has the power to control reserves; effective money may, however, grow, thanks to a higher deposit multiplier or a change in financial habits hastening the velocity of money. If the restrictive monetary policy actually aims to constrain the larger, effective, quantity of money, the central bank must determine a dramatic compression in reserves, and this usually happens when the boom is already well under way. The cost of the intervention is a sudden and unexpected rise in the rate of interest – just the kind of event which, according to Minsky, may trigger a financial crisis. The late Minsky rejected the idea that the central bank is able to control reserves (see Minsky, 1986a and Fazzari and Minsky, 1984; see also Wray, 1992 for discussion).

For Minsky, monetary policy is powerful only when it succeeds in making the money supply inelastic, and – as we shall argue later on – this happens exactly when the demand for finance is also rigid, when the debt burden in balance sheets is high, and when liquidity in portfolios is low. To avoid debt deflation and a lasting depression, the central bank has to make a U-turn, providing banks with fresh reserves. This argument, once again, supports Minsky's views about the endogeneity of money. What is typical of Minsky, on the other hand, is that in his model the endogeneity of money affects both the quantity and the cost of finance – that is, both the supply and the rate of interest.

THE TWO-PRICE MODEL

The capitalist process is a network of intertemporal, uncertain cash flows, where balance sheets are intertwined. The importance of this monetary perspective is prominent in the inquiry about the determination of the demand (and production) of new capital goods. In the following, we shall briefly sketch the determination of investment according to Minsky's two-price model.

The price of current output includes the price of consumption goods and the price of investment goods. Producers have given short-term expectations about costs and demand in the period. They fix prices to recover direct costs (the main component being, in the aggregate closed economy, money wages) and to earn a residual: deducting overhead costs, we obtain gross profits. Gross capital income less gross cash payments on debt and on dividends defines the maximum amount of internal financing. If the firm acquires new capital goods and runs into debt because actual investment exceeds the level which may be financed internally, the supply price of new capital goods must embody the lender's risk – namely, the risk imputed by would-be lenders to additional loans to be extended to already indebted firms; or the risk of losing the money invested (again, though banks aren't lenders in Minsky, a similar reasoning may be applied to them). This risk, though reflecting subjective valuations, is represented by 'objective' variables: it takes the form of a higher cost of finance or of explicit agreements in financing deals, thus increasing the price of investment good to the buyer. A higher leverage means a higher risk, and so a higher price. For a given set of long-term expectations of the lender, the schedule for the supply price of investment goods is upward-sloping. The greater the leverage and the harder the terms required by the lender for the financial contract, the steeper the slope of the curve. The supply price of the investment function will be shaped by the marginal lender's risk. It is decisively influenced by monetary and financial markets (including the behaviour of the money supply and liquid assets) and by liquidity preference, since those factors determine the financial contracts and the margins of safety agreed upon by lenders and borrowers.

Investment will take place if the demand price is higher than the supply price. The demand price of the flow of new capital goods depends on the market price of the stock of capital assets on the stock exchange. Following Minsky, we shall focus on shares, treating bonds as something intermediate between shares and bank loans. Both financial instruments and capital assets yield expected money receipts and originate cash commitments. The present value of positions in capital assets results from discounting back future earnings, and moves with firms' and shareholders' long-term expectations. The capitalization rate depends on the expected rate of interest on money loans, which is the opportunity cost of investment, and on the evaluation about the latter's specific risk, because of the uncertainty with regard to expected quasi-rents and the liquidity of positions. When the investor needs external finance, there is a deduction from the demand price of new capital goods due to borrower's risk. This 'subjective' risk is higher the larger the commitment to a particular type of capital asset (because there is an increase in the perceived risk of default) and the greater the leverage. As a consequence, the demand price schedule is downward-sloping.

If short-term expectations – about cash inflows, cash outflows, or about the possibility or conditions of new borrowings – are not confirmed, long-term expectations may be revised, and this can lead to changes in the value of capital assets. The price of capital assets is intrinsically disconnected from their cost of production. The notions of a basic independence and of a greater instability of the price of capital assets relative to output prices follow from Minsky's tracing back of the demand price of new capital goods to the market price of stocks. On the one hand, shifts in portfolio choices bring about changes in investment; on the other, the price of stocks hinges on expectations about the residual in-cash inflows once taxes and cash commitments are deducted from gross profits. Complex two-way links and feedback have to be considered, and may produce speculative dynamics.

The relation between the price of capital assets and the price of current output is the fundamental relative price in the capitalist economy. Taking into account the internal financing constraint, the possibility of raising borrowed funds and the conditions shaping external finance of positions in capital assets, the intersection of the demand price function with the supply price function of new capital goods determines investment demand and production.

The two-price model is the analytical tool by which Minsky integrates his theory of money and finance into his theory of investment. For a given set of short-term and long-term expectation, a given state of uncertainty, and given margins of safety, variations in the quantity of money fix the rate of interest on money loans and the value of liquidity. The capitalization rates of the quasi-rents expected from capital goods and financial assets may then be derived by considering the different liquidity pertaining to different investments; capitalization rates help obtain the demand price of each unit of new capital goods. The equality of demand price with the supply price determines the value of the investment that actually takes place. The sum of all the investments of all firms is aggregate investment. Minsky's approach differs from Keynes's in that it explicitly puts the price of capital assets at the heart of the theory of money demand. Nevertheless, it may be seen as walking in Keynes's footsteps:

- a. for a given state of uncertainty and a given set of expectations, an increase (decrease) in money supply determines a fall (rise) in the rate of interest, producing a shift along a given liquidity preference schedule;
- b. long-term expectations influence the capitalization of prospective earnings;
- c. the present value of future gross profits and the rate of interest jointly establish the demand price function for investment goods;
- d. the quantity of the new capital good bought is settled by the meeting point between the demand and supply price functions.

The attention given to liability structures and the endogeneity of ‘effective’ money opens the door for Minsky to analyse how changes in portfolio management and balance sheets, due to shifts in confidence, have immediate effects upon the price of capital assets – for example, positive changes in the state of uncertainty or in expectations produce a shift of the liquidity preference schedule to the right, and hence they positively affect capital assets evaluation and the amount of investment. The creation of money and near-monies brings about similar effects, and, according to Minsky, financial instruments issued to satisfy new financing demands are more easily accepted with a lower liquidity preference. The two factors together give scope for a higher ratio of short-term cash-commitment outflows to expected cash inflows, and cause a rise in the price of capital assets. The reverse chain of events sets in with an endogenous destruction of money and near-money, coupled with a higher liquidity preference. The supply of finance needed to start production and hold positions in capital assets expands (contracts) just when precautionary and speculative money demand goes down (up).

The growth in investment induces a larger money supply, a lower liquidity preference, and a heavier burden of debts in the economy. As long as banks’ and financiers’, together with firms’ and speculators’, expectations are confirmed on the market, the economic units confidently enlarge their holdings of real and financial illiquid assets. In the same expectational climate, they feel confident about reducing the margins of safety: there is therefore a decrease in liquid balances relative to the market value of assets in portfolios, and an increase in shorter-term cash commitments whose validation is conditional on mounting gross profits. The higher leverage and the higher debt service are sustainable only if the optimistic mood is not proved wrong.

PROFITS AND DISTRIBUTION

In Minsky’s framework, the critical relation in capitalist dynamics is that between after-tax gross capital income and cash payments on debts. To produce and buy capital assets, expected gross capital income has to be larger than future cash commitments, if not for each period, at least for the relevant time-horizon. Hence, to keep the difference between cash inflows and cash outflows positive, two expected time-series must be borne in mind: the one that has to do with future receipts, which must be actually realized, and the one that has to do with dated cash payments, which has its roots in the debt structure chosen in the past and depends also on the behaviour of the current cost of financing. Realized profits are for firms the source of the cash flows needed to cope with cash commitments. Expected profits, positively linked to current profits, are the incentive to invest. Sufficiently high realized and

expected profits are essential to allow firms the rolling-over of maturing debt and the raising of new loans. As a consequence, expectations about future profits rule current investment and financing decisions, and current profits validate past decisions. Profits are the key variable for real growth and for the financial dynamics of the economy, because their determination and distribution are crucial both in settling investment demand and in validating debt and capital asset prices.

The centrality of profits in Minsky is confirmed by his reprise of Kalecki's theory of prices and distribution. Again, following Minsky, we shall focus on the simplest case. Though built upon 'heroic' assumptions, it is helpful as a first approximation: it highlights the role of profits in capitalism, and emphasizes investment as the most unstable component in aggregate demand. Suppose we are in a closed economy with a small, balanced-budget state; the macro agents are thus only banks, firms and workers. Production consists of a composite investment good and a composite consumption good. The propensity to consume of workers is unity, and the propensity to consume of the capitalists is zero. In this elementary setting, profits in the consumption-goods sector are equal to the wage bill of workers employed in the investment-goods sector. Fixing a price which includes a mark-up on labour costs is the device that allows the allocation of the amount of goods made available to the working class among the whole labour force in the economy. It is also the means by which a share of the labour force is apportioned to the production of a surplus. Since total profits are equal to the sum of profits in the two sectors, they are equal to the sum of the wages and profits of the investment-goods sector. Hence total profits are equal to aggregate investment. Whereas total production is financed by bank loans, consumption demand is immediately financed by wage income, and investment demand in excess of the money recovered on the financial markets is immediately financed either by banks or by financial intermediaries. The different access to finance defines the hierarchy between social classes and between autonomous and induced expenditure, and the distribution of income results from the volume and composition of effective demand.

When we add the Big Government or open the economy, this argument is not abrogated, but is elaborated. What is particularly important for Minsky is the conclusion that including the Big Government makes total gross profits – namely, the cash flows that firms draw upon to meet their cash commitments – a positive function of government budget deficits. The Keynesian idea of expansionary fiscal policy as stabilizing is here reinforced. When state expenditure is higher than taxes, the consequence is not only an expansion of demand but also a support to liability structures via gross profits. In an open economy, gross profits are also replenished by a trade surplus. In general, gross profits are depressed by workers' savings and fostered by capitalists' consumption.

According to Minsky, the availability and the terms of financial agreements govern investment, investment brings about gross profits, and gross profits feed back into the financial structure. Current investment and financing decisions set the parameters limiting future choices. We have already pointed out that, in Minsky, prospective money profits as expected cash flows are the carrot inducing current investments, and as realized cash flows are the stick validating or not past investment. If higher than the amount needed to satisfy cash commitments, they are the source of dividends and retained earnings which positively affect long-term expectations of banks, firms and shareholders. But in a capitalist economy investment today will yield profit only if expected future returns come true. Thus the smooth working of such an economy is based on the general belief that future investment will breed enough gross capital income to repay debt. During tranquil growth, and even more during boom euphoria, the rise in investment causes a multiple rise in aggregate demand and income, and an expansion in gross profits. If actual receipts are larger than expected and short-term expectations are revised upwards, internal financing will be higher and leverage will be lower than expected. Borrower's and lender's risks will be marked down. In the two-price model both the overestimation of prospective gross profits and the underestimation of borrower's and lender's risks propel debt-financed investments. The reverse sequence is active during recession and depression.

TAXONOMY OF POSITIONS

Mainstream economics – from the neoclassical synthesis (the fountainhead of both ‘bastard’ Keynesianism and monetarism) to today's opponents (new classical macroeconomics and new Keynesian economics) – is silent about the evolutionary course leading from stability to instability. If any explanation is provided, it has to do either with exogenous shocks or with policy errors. On the contrary, Minsky puts forward a theoretical standpoint where the cycle, passing from tranquil expansion to boom and then collapsing into financial crisis, recession and risk (or reality) of debt deflation and chronic depression, is nothing but the normal outcome of the capitalist process. In Minsky's case structural instability is endogenously exhibited by bringing together all the elements of his approach we have reviewed so far, plus one. The missing ingredient is his taxonomy of positions.

We saw how Minsky's starting-point is that the production of new capital goods and the ownership and control of those assets that cannot be readily converted into cash – ‘positions’ – needs to be financed. And we noted that tangible and financial assets are held in view of a positive difference between cash receipts and cash payments on account of both principal and interest

(Minsky sometimes labels them balance-sheet cash flows). Cash-payment commitments on the outstanding liabilities may be disbursed drawing on normal or ordinary sources of cash: income cash flows are indeed the main 'primary' source of cash, the other being the issue of new liabilities (refinancing). There are situations, however, in which, to fulfil the terms of financial contracts, units have to fall back on 'secondary' sources of cash, pledging or selling assets, or running off their emergency source of cash (that is, through portfolio cash flows). To meet cash flows on inherited liabilities through income cash flows is, in a sense, 'sound' finance, and an economy in which income cash flows are dominant is 'robust'. Refinancing is risky in that the new borrowing may be on harder terms than the original financing. Selling assets is even more dangerous: if there are no secondary markets, or if they are inefficient, prices may sink dramatically. Moreover, 'leveraging' equity may block the way out of raising funds by selling negotiable or redeemable assets on broad, deep and resilient secondary markets. And, finally, portfolios may be almost devoid of default-free assets, like government debt or gold, of protected assets, like bonds or saving deposits, or of idle cash.

The ratio between uncertain (income) cash inflows, subject to sharp and sudden revaluation, and certain (balance-sheet) cash outflows is the key factor in assessing the liability structure of economic units. For hedge-financing units, prospective income cash flows (expected quasi-rents) from positions in assets are greater than contractual cash-payment commitments on debts for every period. The expected present value of capital and/or financial assets is positive for all likely rates of interest. The outstanding debts tend to fall, while the book value of equity and the amount of cash held as implicit 'insurance' tend to increase over time. A business hedge-financing unit may see cash flows from operations fall short of anticipations because of events in the labour market or in the commodity market (economic risks), with actual quasi-rents going below expected quasi-rents. It is, however, safe relative to a financial turmoil, and depends only on the normal functioning of product and factor markets.

A unit is speculative if, even though expected income cash flows from assets in positions generate sufficient cash to meet the contractual cash-payment commitment for the entire horizon of the investment, in the near term, cash inflows are less than (balance-sheet) outflows. In particular, income cash inflows are higher than interest charges on external finance, but the repayment of the principal has to be met through refinancing – so as not to be compelled to draw on cash reserves or liquidate assets. For a speculative financing unit near-term cash deficits are more than offset by cash surpluses in the long term. However, at some set of interest rates there may be a reversal from positive to negative present values. The speculative financial structure also depends upon the normal functioning of money markets, and is

subject to financial risks. But, if expectations about the two time series of expected income cash flows and expected rates of interest are confirmed, then the dynamics of outstanding debts, equity, and precautionary holdings of cash is similar to the hedge-financing case.

A Ponzi finance unit is defined as a special instance of a speculative financing unit for which, in the near term, the income part of cash inflows is lower than the payments of all the contractual cash commitments to debt-holders. The unit has to raise funds through additional debt not only to pay the principal but also to fulfil interest payments. For some the outstanding debt will grow even if the unit does not buy new income-yielding assets, and in the future disbursements on these new debts will add to the original financing. Total cash inflows higher than total cash-payment commitments on debt often require some ‘bonanza’ in later terms. Ponzi units, like speculative units, have to take into account both economic risks on expected receipts and financial risks on the behaviour of short-term costs of refinancing. Even a small rise of the interest rate can dissolve the positive expected quasi-rents of the investment.

A decrease in prospective earnings may turn a hedge-financing unit into a speculative financing unit. With unchanged expected profits, movements in financing costs may turn speculative units into Ponzi units, and transform a positive present value into a negative present value. An investment may abort because of an unexpected rise in the short-term rate of interest, or even a fall in the value of assets which may be used to ‘make a position’. Indebted firms may be unable to satisfy their cash commitments; their insolvency may undermine the liquidity of their banks and financiers. Banks may not renew their loans, and/or there may be a bank ‘run’. The money network of intertwined balance sheets, the integration of finance and production, and the central role of banks in the financial system are all factors which spread crises of particular firms or sectors to the whole economy; when crises reach the banking sector the trouble is even more serious. Over a period of good years the weight of units with speculative and Ponzi positions increases, and the economy becomes more fragile: a minor shock may initiate a major debt deflation which, if not opposed by active economic policy, may lead to a deep and long depression.

SYSTEMIC FRAGILITY

The financial instability hypothesis states that tranquil growth and prosperity in modern capitalist economies naturally bring about changes in cash-flow interconnections leading from solidity to fragility, and that the normal functioning of the economy may easily convert fragility into open financial crisis.

Let us begin with a financially robust economy, where almost every agent is in a hedge-financing position. The economy experienced cycles in the past, but is now in tranquil prosperity. Operators remember past crises: they maintain, therefore, ample margins of safety in their liability structures, and balance sheets are awash with cash and very liquid assets. As long as economic development goes on without shocks, optimistic forecasts are validated. Banks and firms expect wide positive future quasi-rents, and bet on an upward trend in the value of real and financial assets. The margins of safety chosen in the past look over-cautious, and the implicit insurance price of cash holdings gets lower. While precautionary and speculative demand for money decreases, financing demand takes off. Banks and financial intermediaries have no difficulty in raising supply hand in hand with demand, either through new issue of traditional means of payment financial instruments or through financial innovation. Positive expectations, lower liquidity preference, contraction of the margins of safety, monetary expansion and financial innovation initially cause the rise in the price of capital assets relative to the supply price of capital goods output. The demand and production of new capital goods blossom, and gross profits improve. Internal financing will be higher, and external financing lower, than expected. Borrower's and lender's risks are underrated. The consequent validation of outstanding debts and of the most risky projects fosters euphoric growth, and prosperity develops into boom. The upward instability, and the finance sustaining it, are endogenous outcomes of stability.

According to Minsky, short-term rates of interest much lower than long-term rates of interest are the hallmark of tranquil growth. A rising debt/equity ratio is associated with higher short-term financing of fixed capital and long-term financial assets. We have already noticed that during expansion the share of speculative and Ponzi units in the economy grows. Though at first this does not interfere with the smooth course of prosperity, it is highly unlikely that the capitalist process can proceed undisturbed by financial developments forever. The reason is clear if we look more closely at banks and firms. Commercial banks are typically speculative units since their activity implies the short financing of long positions. With the 'lengthening' of their balance sheets, they become more and more fragile. Sooner or later they will ask for a higher rate of interest to provide further loans: the supply of finance will become increasingly inelastic and its slope will climb. On the other hand, firms have to ask banks for finance to start production of both consumer goods and investment goods, and they expect to recover their advance with a mark-up thanks to their sale proceeds. Production of investment goods, however, is special in this sense: their construction time spans many periods and their returns flow from an uncertain future. While the final finance enabling consumption goods producers to satisfy their cash commitments comes from the wage bill, the final finance enabling producers to meet their contrac-

tual financial payments is, in Minsky's perspective, partly borrowed. The short-term debt of investment goods producers is 'funded' – that is, the short-term bank finance initially needed to produce investment goods is turned into the longer-term external finance needed to buy the new capital goods, by the financing arrangement of investment goods purchasers. The share of production finance which is so 'funded' is larger when firms rush into ever longer investment projects. Thus the financing of investment production and demand comes about through external debts, and investment activity makes firms into speculative units – and some of them, especially during euphoric growth, even into Ponzi units. As a consequence, the demand for finance becomes almost inflexible in the course of the cycle. Short-term demand for finance shifts to the right, and takes a more vertical shape. As long as the supply of finance is nearly horizontal at slowly rising short-term interest rates, monetary and financial developments don't put a brake on investments. For a time, the euphoric boom is self-feeding, chasing its own tail. Things change when the supply of finance sticks up vertically, because of more prudent bank attitudes or of tougher restrictive actions from the central bank. The outcome now is a sudden, severe and unexpected increase in the cost of financing. Short-term demand for finance cannot but soar, further contributing to the progressive rise in the rate of interest.

Minsky's argument so far has emphasized two points:

- a. the endogenous increasing subjection of the economy to upward movements in the rates of interest, because of capitalism's upward instability;
- b. the consequent endogenous upper turning-point, with the violent break-out of the financial collapse.

This, of course, does not preclude crises' being due to exogenous factors. In general, however, crises are consequent either on a fall in gross profits or on an unexpected rise in the rate of interest. We have seen how this latter is the spontaneous outgrowth of the internal working of banking mechanisms or of central bank policies, since through the period of prosperity the supply of finance becomes less and less elastic and the demand for finance more and more rigid. The dramatic rise of the short-term rate of interest when money supply suddenly becomes vertical implies that refinancing will involve an escalation of cash outflows relative to cash inflows, and gives way to an upward shift in the supply price schedule for investment goods. At the same time, a higher short-term rate of interest makes likely a higher long-term rate of interest, which affects the capitalization of future gross profits. As a consequence, the demand price schedule for investment goods will shift downwards, unless an increase in expected quasi-rents does not compensate for the rise in the discount rate. Investment, and, thus, current and expected

gross profits, decline, making the debt burden even heavier. A recursive negative spiral gets going. Some firms get into financial trouble, others fail. The missing validation of cash-payment commitments on outstanding debts leads to the revaluation of borrower's and lender's risks, and to the reassessment of liability structures. In the meantime, the rising rates of interest endangers the liquidity and solvency of banks and financial intermediaries. Liquidity preference goes up, demand deposits contract, financial instruments may not be 'accepted' by the banking system. The struggle to 'make position by selling positions' turns out to be ruinous because of the immediate fall in asset prices. Capital asset prices may fall below the price of investment goods, and the surge in the rates of interest may even bring about a present-value reversal, from positive to negative.

When net-worth destruction and illiquidity have spread to a significant number of units, investments completely stop and gross profits plummet. Even hedge-financing units become speculative or Ponzi. Debt deflation and financial turbulence strike the real economy, curbing income growth and bringing about mass unemployment. In an economy with a small public sector and with a central bank which does not act as a lender of last resort, the lower turning-point will occur only after monetary contraction and bankruptcies restore 'robust' finance. It may be a road to hell. In a capitalist economy with endogenous money the collapse of goods and asset prices results in a decrease in cash inflows and perhaps a rise in cash outflows. Moreover, the drop in endogenous money slows down the adjustment process through deflation and impedes the rise in the so-called 'real-money balances', while expectations of further falls in prices motivate private agents to postpone demand. The Pigou–Patinkin effect does not work in a world where the money supply is endogenous.

THE ROLE OF ECONOMIC POLICY

What we have just depicted gives us the form of the cycle for US capitalism before the Second World War. Since the New Deal, economic policy has been committed to preventing the upper turning-point's degenerating into a full-blown financial crisis and great depression, by raising the lower turning-point. Earlier stabilization was due to Big Government's budget deficits and the central bank as a lender of last resort. Budget deficits translate into higher gross-money profits; moreover, financial instruments put out to finance the deficit are secure assets in portfolios and strengthen the 'robustness' of balance sheets. Against this background, the eventual fall in capital asset prices does not carry with it a profit crash, because output prices are sustained by a larger automatic or discretionary government deficit, fuelling aggregate de-

mand and hence firms' production. At the same time, the government pumps into the market secure and readily marketable assets and creates a floor for liquidity. Thanks to expansionary fiscal policy, firms are able to satisfy cash-payment commitments on outstanding debt, and debt deflation is either weakened or completely inhibited. This kind of intervention, however, takes time. It must then be associated with a prompt injection of liquidity and purchases of securities from the central bank, establishing a lower limit for the value of assets. In general, the central bank has to monitor and regulate financial institutions and practices.

Active economic policy imposes new initial conditions constraining the system's instability. A long-lasting economic crisis can never be ruled out in capitalism, but it is not necessary, unless policy institutions choose not to act. The right policy mix, however, is far from easy to find in a given concrete situation. According to Minsky, economic policy is unable to abolish the fundamental processes leading to instability: what it can do is to repress and counteract the most harmful ills, and to make sure that 'it' does not happen again. For instance, the central bank cannot stop the increase in the quantity of finance actually supplied in the upswing, and it can regain control over the 'effective' quantity of money only if it is willing to risk the outbreak of a financial crisis; the upper turning-point, however, would sooner or later be reached even if the central bank refrained from monetary contraction. But the central bank can control the unfolding of the crisis, if it prevents banks' and financial intermediaries' bankruptcies with timely refinancing and an adequate inflow of reserves. During the other phases of the cycle, monetary policy is not very helpful, since money cannot be limited and since financial innovations periodically defy regulations, while fiscal policy is more reliable. However, Minsky is critical of how budget deficits have been pursued in the past: through non-selective support for private investments, irrespective of their contribution to a more efficient industrial structure, or through unproductive transfers. As a consequence, the undesigned and unwanted outcome of fiscal and monetary policies in support of financial structures to avoid debt deflation has been to increase the number of speculative and Ponzi units, to shorten firms' time-horizon, and to slow down productivity growth. Hence, the price paid for 'it' not happening again has been that prosperity is much shorter, and the next financial crisis much nearer. Fiscal policy, Minsky says, must therefore be more flexible than in the past.

To 'fine-tune' a capitalist economy, in Minsky's view, is an impossible task. Good policies in a given situation are bad in another one, and profit-seeking agents will periodically find ways to circumvent regulations. An agenda for reform can nevertheless be sketched out. On the one hand, debt deflation and big depressions must be opposed; on the other hand, financial structures must be 'simplified', restoring the possibility of a lasting 'tranquil'

progress. Institutional innovation and the reform of the public sector is the answer to firms', banks' and financial intermediaries' innovation. Among Minsky's policy suggestions, the following may be reported: the incentive for the production of consumption goods through less capital-intensive techniques; the indirect support to productivity through public infrastructural expenditure and through research and development; the introduction of limitations to firms' liability structures; a fiscal structure such that the government budget goes automatically into surplus (deficit) when investments, income and employment are high (low); a restructuring of public expenditure, reducing transfer payments and favouring employment programmes; the state as the employer of last resort; the privilege accorded to equity finance relative to debt finance; policies promoting small and medium firms and banks rather than big conglomerates; and a shift in firm ownership from capital to labour.

THE LEGACY OF MINSKY

Minsky's vision is that a capitalist economy, with profit-seeking agents and periodical innovations, is best described as a network of financial relations with the monetary system as its heart. What matters most are the opinions, bargainings and choices of bankers and entrepreneurs on debt-financing of investment, whose prospective returns are radically uncertain. The interaction between money, production and investment dominates the endogenous and cyclical system dynamics, which may always deteriorate into lasting depressions and mass poverty. It is, however, possible to constrain the structural evolutionary metamorphosis of capitalist market processes through government intervention and the action of the central bank on financial practices. Economic policy must promote institutions and interventions working as 'thwarting systems': if adequately designed, they ensure that the outcomes are viable or acceptable and act as a floor to capitalism's downward instability (cf. Ferri and Minsky, 1992).

This vision rules Minsky's main analytical contributions, those we have briefly summarized in the previous pages. His doctrine may be encapsulated in the following points, which largely follow Minsky's own list (and words) in his entry in the *Biographical Dictionary of Dissenting Economists* (Arestis and Sawyer, 1992, pp. 355–6), but rearranged to follow the order of our exposition:

- a. the *cash-flow* analysis of financial relations, which emphasizes the flows of income from the productive part of the economy that can satisfy financial obligations (and the special accent on the role of gross profits in the eventual validation of firms' liability structures);

- b. the significance of *banks* and *financial* institutions as profit-seeking agents which react to perceived profit opportunities with financial innovations (and, so, the stress on the *endogeneity* of the ‘effective’ quantity of money *and* of the rate of interest);
- c. a re-writing of Keynes as an *investment theory of the business cycle* and a *financial theory of investment* (and, so, the two-price model dissociating the determination of output prices from the determination of capital asset prices);
- d. the *financial instability hypothesis* which holds that over a period of good times the financial structures of a dynamic capitalist economy *endogenously* evolve from being robust to being fragile, and that once there is a sufficient mix of financially fragile institutions, the economy becomes susceptible to debt deflation;
- e. the significance and necessity of central banks’ being *lenders of last resort* in order to help abort and contain debt deflation and, thus, the drive towards deep depressions;
- f. the significance and necessity of *Big Government*, whose budget is a large percentage of national income so that government deficits are sufficient to act as a stabilizer to aggregate profits.

In an open economy, another special Minsky point of view must be added:

- g. the tier approach to the balance of payments, which emphasizes the significance of international payments as shifts of profits and other incomes among national economies, and how balance-of-payments cash flows are necessary to validate the payment commitments on international indebtedness.

The facts that stimulated this vision were the Great Depression and the absence of a deep and long-lasting depression after the Second World War. With regard to his theoretical background, Minsky’s main reference is patently Keynes: explicitly, the Keynes of the *General Theory* liquidity preference, implicitly, the Keynes of the *Treatise on Money*, and hence the Keynes building upon the Wicksellian connection running through heterodox monetary theory at the beginning of the twentieth century (on this, see Kregel, 1992). Minsky’s debt to Fisher in grafting debt deflation on to Keynes is also well known. Minsky himself acknowledges his debts towards his Chicago teachers and mentors, Simons and Lange, and also the influence of Hansen, with whom he worked at Harvard. Henry Simons taught Minsky that the main shortcomings of capitalism have their causes in the very financial structure necessary to ensure the system’s dynamism. Simons’s legacy is also clear in Minsky’s non-reductive approach to the nature of money, in the stress on the variability of the

velocity of circulation, and in the positive proposal to constrain businesses' liabilities and banks' and financial intermediaries' assets. Oskar Lange's lesson was important in originating Minsky's utopia of reconciliation between a system where decisions are decentralized but financing depends on strong non-market regulations and full-employment non-inflationary stability requires the socialization of investment. The link with Alvin Hansen, notwithstanding the latter's mechanical reading of Keynes, lies in the common institutionalist pragmatism and reformism. For Minsky, there are no general laws of the economy but 'typical' capitalist relations and behaviours; and there is no unique kind of capitalism, but an indefinite plurality. As a consequence, theory must take into account both the permanent constitutive features of capitalism, and the transient more contingent elements.

Apart from Keynes, the two other giants looming behind Minsky are Schumpeter and Marx. The threads connecting Minsky to the Austrian economist are manifest (Minsky, 1986b, 1990a and 1993): a vision of capitalism as a monetary process; the emphasis on innovation, both in real and financial phenomena; an upward-sloping money supply, shifting pro-cyclically; and the endogenous structural instability. But these points are exactly those where there is a line of continuity between Schumpeter and Marx. Moreover, Minsky's implicit relation to Marx is reinforced by his use of the Kalecki equations. The macroeconomic determination by total investment demand of gross-money profits makes sense in the context of the Marxian picture of a cycle, or circuit, of money capital, where there is a clear distinction between agents with a privileged access to finance, the monetary and industrial capitalists, whose expenditure is autonomous, and agents like wage-earners, whose money income is fixed by capitalist choices, and whose demand is passive. The reference to Schumpeter and Marx clarifies that Minsky's accent on money cannot be interpreted, as some have read it, as a position where only money matters. Minsky's methodological point is rather the same as Schumpeter's, that is, to explain the capitalist process as a whole, money must be introduced at the very ground floor of the analytical structure (Minsky, 1990b).

According to Hyman Minsky himself, his first three articles to appear in prestigious journals (Minsky, 1957a, 1957b, 1959) constituted the backbone of his analytical apparatus. In particular, three aspects emerge in those writings that remained as a 'leitmotiv' throughout his life:

- a. the stress on the importance of financial factors considered as evolutionary and innovative phenomena;
- b. a dynamic vision of the economy based upon an *endogenous* explanation of the business cycle;
- c. the presence of ceilings and floors.

Although the presence of point (a) put Minsky within the group of heterodox macroeconomists of those times, his peculiarity came either from his using points (b) and (c) or from the particular use he made of them.

The financial aspects were rather neglected in the initial Keynesian tradition, both static (consumption function models, the IS–LM framework, forecasting macroeconometric models) and dynamic (the so-called Harrod–Domar models). Paradoxically, it was their inclusion in Patinkin’s synthesis which reduced Keynes to a theoretically particular, though historically significant, case of the neoclassical flex-price model (see Ferri and Minsky, 1989). At the beginning, Minsky made them appear indirectly as an influence on the accelerator parameter governing the investment function. Subsequently, he admitted that the ceilings and floors might have to do with the dynamics of money and its velocity. In the end, with a more sophisticated version of the financial instability hypothesis (discussed above), the financial factors tended to occupy a pre-eminent position. The following points are the most important:

- a. from the beginning, Minsky extended profit-seeking behaviour from entrepreneurs and businessmen to bankers and financiers;
- b. later on, Minsky tried to introduce more heterogeneity of behaviour within the same class of agent, according to their financial position (hedge, speculative and Ponzi finance);
- c. as a consequence, the endogeneity of money in Minsky’s perspective affects both the money supply *and* the rate of interest.

This third point follows from Minsky’s articulation of production and investment finance with liquidity preference – that is, from his synthesis of the vision of money as purchasing power and the vision of money as a store of wealth. It is this peculiarly Minskian view of money which marks his originality within the post-Keynesian strand, and opens up the possibility of a dialogue with the French–Italian theory of the monetary circuit as well as with Tobin’s portfolio approach. The fourth novel element in Minsky is:

- d. the use of piecewise-linear model.

Something is lost in mathematical neatness, but this analytical technique helps us to identify better the interaction between the endogenous evolution of the system and the dynamics of the institution represented metaphorically by ceilings and floors.

In time, these themes were enriched by further developments, but the argument was not changed in its essential nature. In Minsky the necessity of microfounding the analysis is straightforward. This is clear in his study of the

determinants of investment in a monetary economy and in an uncertain environment, as well as in the inquiry about the interaction between cash flows and financial commitments. What really matters in Minsky's framework is more the presence of monetary and financial links with the real economy, and the fact that the reliance of firms on debt finance makes capitalism intrinsically unstable, than the presence of a precise investment function. Although microfounded, Minsky's analysis must be interpreted more as a macrofoundation of microeconomics than vice versa. This means that his route has been macro–micro–macro: he starts from the determination of aggregate demand and total gross profits in the period, together with the liability structure inherited from the past; then he looks at the micro consequences of the current ratio of gross capital income and cash-payment commitments on individual choices about financing and investments; and finally he reconstructs the macro effects on the system's evolutionary dynamics. In this perspective, his utilization of the Kaleckian profit equation represents both a confirmation of this thesis and a deepening of previous writings, when he was still working in terms of sectoral flows. The macrofoundation of microeconomics sets Minsky apart from the new Keynesians. A further contrasting element is Minsky's refusal to refer to Walrasian general economic equilibrium as the relevant benchmark to assess capitalism's 'imperfections', and then to reconstruct the economics of Keynes on market 'rigidities'.

Two theorems which differ from the accepted view emerge from these propositions, whose main aim is to show rigorously that the internal dynamics of a capitalist economy will in time lead to unacceptable system states. The first is an anti-*laissez-faire* theorem and the second is a 'limitation upon the attainable' theorem. The anti-*laissez-faire* theorem states that in a world where the internal dynamics imply instability, a semblance of stability can be achieved or sustained only by introducing conventions, constraints and interventions into the environment. The conventions imply that variables take on values other than those which market forces would have generated; the constraints and interventions impose the initial conditions or affect parameters so that individual market behaviour changes. The second theorem, relating to the limitations on performance, follows from the first. The pursuit of individual gains or well-being in the market leads the system to rush off into inflation, deflation, or rapid oscillations, which throw out signals that exceed computational capabilities, and the economy will from time to time be moving rapidly away from any reasonably defined notion of 'allocation' or stabilization efficiency. If there is an observation lag, and less than perfect adjustment by interventions, the system can never be in an optimal allocation alignment. This implies that the 'practical best' for an economy falls short of the abstract best.

Two consequences follow. First of all, the shape of policy is different from that of the orthodoxy. For instance, monetary policy also refers to the price of assets and stresses the role of lender of the last resort by the central bank. Second, the complex interplay between endogenous forces and thwarting institutional mechanisms has an impact on actual dynamics and develops new contradictions. In other words, the structure of capitalism evolves. The New Deal institutions born out of the Great Depression have created the seed for an inflationary bias. Minsky did not live long enough to study the extent to which the institutional changes carried out by Mrs Thatcher and Reagan had a deflationary bias.

THIS VOLUME

The first part of this volume explores the dynamic macro-links in the Minskyan system. In the first chapter, Alessandro Vercelli argues that in both Keynes and Minsky financial instability concerns structural instability and not the more usual, traditional, concept of dynamic instability. In Keynes, the more serious troubles in a monetary, capitalist economy originate from perverse displacements of the liquidity preference and the marginal efficiency of capital curves. These movements are induced by endogenous or policy shocks, and cannot be satisfactorily interpreted in terms of dynamic instability but only in terms of structural instability. The same conclusion holds for Minsky's account of financial fragility, which plays a key role in his theory of depressions. The internal changes in financial fragility conducive to, and accompanying, the debt-deflation processes represent endogenous alterations in the degree of structural instability of a complex monetary economy. In both Keynes and Minsky the structural instability immanent in a monetary economy is rooted in the shifts of strong systemic uncertainty perceived by the economic agents and affecting their choices: this picture can be reconciled with the view that stresses the bounded rationality of agents' behaviour.

Piero Ferri deals with some aspects of another characteristic contribution by Minsky, namely his constrained dynamic model of ceiling and floor. This model can be interpreted as a general framework in which market forces and institutional thwarting devices interact to generate complex dynamics. In this perspective, the relationships among the Phillips curve, the NAIRU and the process of growth are discussed and evaluated. Consequences for both sides of the debate are identified. In particular, the relationship between NAIRU and sustainable growth is considered in detail. According to the next chapter, by Geoffrey Harcourt, the essence of Minsky's analysis of the interrelationships between the real and the financial sectors of the economy lies in the fact that production, employment and investment decisions have to be made discounting

expected and uncertain cash flows. Expectations are often disconfirmed. Unrealized cash flows on investment projects lead firms and banks (and other non-banking financial institutions) to be either too optimistic or too pessimistic. Either way, they build into their balance sheets definite financial commitments which, sooner or later, they will have problems in meeting. In this way, financial factors amplify the cyclical tendencies already present, associated with real factors. If banks collectively could be persuaded always to take longer-term views on the prosperity of firms, their combined actions could help to reduce these cyclical movements.

Hyman Minsky's financial instability hypothesis predicts a definite evolution of the fragility of the financial structure as the business cycle proceeds. Minsky specified a dynamic investment equation that formalizes some features of this evolution. The equation relates investment spending to firms' internal cash flow and a leverage factor. The value of the last variable depends on the state of the business cycle and financial conditions. In boom times, firms can leverage cash flow to increase investment well beyond what they can finance with internal funds. In debt deflations, however, investment falls below internal financing. Marc Lavoie and Mario Seccareccia suggest that a macroeconomic link is missing in Minsky's formal presentation of financial instability. Minsky's argument is built upon a microeconomic foundation, which is then generalized to the macroeconomy without explicit consideration of the link between the micro and macro frameworks of analysis. Minsky allowed verbally for macroeconomic feedback effects on corporate net cash flows, which permit lower debt ratios in phases of economic expansion, but he did not consider them in his formal analysis. For Lavoie and Seccareccia, however, leverage ratios may rise or decline during a phase of economic expansion, depending on what is happening to such parameters as central bank interest rate policy and the behaviour of government deficits. The chapter includes an empirical assessment of Minsky's hypothesis which concludes that it has at best weak empirical support.

The chapter by Steven Fazzari, Piero Ferri and Edward Greenberg opens the second part of this volume, dedicated to chapters modelling instability in the style of Minsky. They provide a coherent micro-macro perspective for Minsky's analysis that answers some of the objections raised by Lavoie and Seccareccia. The formalization of Minsky's investment theory is specified in a framework where firms' production and pricing decisions are assumed to be made in imperfect competition. The authors integrate a simple Minskyan version of the investment equation into a dynamic macroeconomic model that endogenously determines the links among aggregate demand, profits and cash flows. They then explore the cyclical macroeconomic properties induced by the Minsky specification and examine the interaction between Minsky's theory of investment and key parameters of the dynamic macro model. In

particular, the sensitivity of aggregate demand to prices and inflation is crucial, because it determines macroeconomic performance and the ability of the system to ‘self-correct’. The simulations provided by Fazzari, Ferri and Greenberg suggest that the link between investment and cash flow, which is crucial in the Minsky approach, matters for macroeconomic fluctuations and may affect the stability of the economy.

The contribution by Richard Arena and Alain Raybaut is articulated into two parts. In the first, Minsky’s contribution to business cycle theory is investigated, with attention to his 1959 model. The main theme considered is the connection between Minsky’s understanding of the phases of the cycle and his conception of the financial instability of market economies. In the second part, Arena and Raybaut develop a stylized macrodynamic model inspired by Minsky’s analysis of economic instability, emphasizing the role played by credit and financial markets in the occurrence and persistence of endogenous business cycles. In the model, the role played by fluctuations of the state of confidence is integrated within the endogenous determination of interest rates. The chapter studies first the stationary equilibria of the model, and then dissects its dynamics to show how indeterminacy and endogenous cycles can occur in a Minskyan analytical framework. In the next chapter Carl Chiarella, Peter Flaschel and Willi Semmler conduct an in-depth discussion of a topic that has resurfaced in economic research because of the recent large-scale financial crises: debt deflation. They formalize the destabilizing role of flexible wages and prices in economies with high nominal levels of debt. This destabilizing mechanism is explored in the context of a small-scale as well as in a large-scale Keynesian demand-constrained economy, stressing the role of labour-market dynamics. In both instances, there is an accelerating downward instability caused by over-indebtedness and declining prices if the process is not stopped by floors to deflation provided by appropriate government policies. Moreover, contrary to conventional views, flexible exchange rates may add to downward instability.

The last chapter is by Domenico Delli Gatti and Mauro Gallegati. They construct a model of production and investment of financially constrained firms in an uncertain environment with capital market imperfections due to asymmetric information and where agents’ heterogeneity plays a crucial role. In this framework, they explore the role of changes in the degree of financial fragility – evaluated by the ratio of the equity base to capital (the equity ratio) and its variance – in the process of fluctuating growth. In a non-linear dynamic setting, this process generates irregular and asymmetric time series in which growth and fluctuations are jointly determined. Depending on the value of the parameters, the model generates either endogenous fluctuations or business instabilities attributable to the interaction of an exogenous impulse and a propagation mechanism. The degree of the heterogeneity of firms

affects the propagation mechanism and, so, the effect of each and every shock.

ACKNOWLEDGEMENTS

These volumes contain the papers presented at the conference ‘The Legacy of Hyman P. Minsky’, held in Bergamo (Italy) in December 1998 to honour the memory of Hyman Minsky, a permanent Visiting Professor of this University. We are very grateful to Hyman’s wife, Esther, and children, Diana and Allan, for having attended the conference. The conference was organized by the Department of Economics (Chairman, Giancarlo Graziola) in close contact with the Jerome Levy Economics Institute (and particularly with Dimitri Papadimitriou, Randy Wray and Jan Kregel), where Minsky spent his last years. Special thanks are owed to the participants to the round table (Augusto Graziani, Siro Lombardini, Luigi L. Pasinetti), who offered a critical summing-up of Minsky’s contributions. We also thank Annalisa Cristini, Joseph Halevi, Riccardo Leoni, Eric Nasica and Alessandro Roncaglia for discussing some of the papers. Generous organizational support was given by Simona Locatelli, who helped during the conference, and Laura Capelli, the secretary of the Department. We also thank Richard Davies for his revision of the English of some of the chapters.

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