

Keynes and Keynesians on Investment Decision-making

A Behavioural Perspective

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...Keynes's theory determines only the *ex post* level of investment, but that it does not say anything about *ex ante* investment...Keynes did not explain precisely what causes changes in investment, but, on the other hand, he has fully examined the close link between these changes and global employment, production and income movements. (Kalecki 1982, 251, 253)

1. A Lacuna in Economics

The opening quotation establishes Michal Kalecki's own view of the need for a behavioural theory of business fixed capital investment. His review of *The General Theory* (Keynes 1936), published in Polish in the same year as Keynes's book (referred to as *GT*) expresses the view that Keynes's analysis '...does not say anything about the sphere of investment decisions of the entrepreneur' (Kalecki 1982, 251, original emphasis). This continues to be a lacuna in economics. Goodwin (1987, 63) observes that '...[i]nvestment, because current decisions depend on an unknown future, has tended to be something of a black hole in economic theory.' Attempting to develop this area further has led to analysis of investment confidence (for example Boyd and Blatt 1988, Ferderer 1993, Anderson and Goldsmith 1996) and its impact on business cycles as 'an endogenous generator of irregularity' (Goodwin 1987, 125).

This article examines to what extent this behavioural lacuna has been addressed by: (i) Keynes from the standpoint of 1936, (ii) postwar Keynesian economics and (iii) recent interpretations of Keynes's uncertainty. The author's own effort to bring together aspects of Keynesian uncertainty into a coherent behavioural model of investment decision-making is briefly outlined. Finally, the policy implications of Keynes's 'socialisation of investment' is interpreted from the behavioural perspective developed.

2. Keynes's Analysis of Investment: 1936 Style

Keynes, in *GT*, uses Simon Kuznets's estimates of net investment in the United States to show the critical role that wide fluctuations in investment have on the pattern of business cycles (1936, 102-6). The empirical proposition that investment fluctuates widely, frequently and quickly can be defined as the *volatility* of private business fixed capital formation.

The General Theory places the investment function at centre stage of the analysis of why a market capitalist economy does not necessarily achieve a full employment equilibrium. In doing so, Keynes took the neoclassical (Marshallian) theory of the firm as the micro-foundations for his downward sloping marginal efficiency of capital [MEC] concept, the essential determinant for an underemployment equilibrium position (Sardoni 1987, 111). Then, through Chapter 22 of *GT*, Keynes links his analysis to the previous business cycle theorists who pointed to investment as the key variable in the instability of the economy.

In Chapter 12 of *GT*, Keynes goes on to develop a theoretical proposition as to the reasons for this volatility in investment. He examines the state of confidence entrepreneurs have with their investment decisions based on the long-term expectations [LTE] they form from past

knowledge. Volatility of investment occurs when the continuity of stable LTE become precarious.

Kalecki's 1936 review of *GT* 'was one of the few' reviews at the time and he '...understood perfectly the importance, the message and the new method of the book.' (Targetti and Kinda-Hass 1982, 245) In the review, Kalecki recognises the crucial role of investment in determining the flow of saving (or profits in Kalecki's own model) and thus production and employment. This is the basis of the opening quotation in this paper from Kalecki's review which clearly places the primacy of investment in the macroeconomic model of employment and business cycles.¹

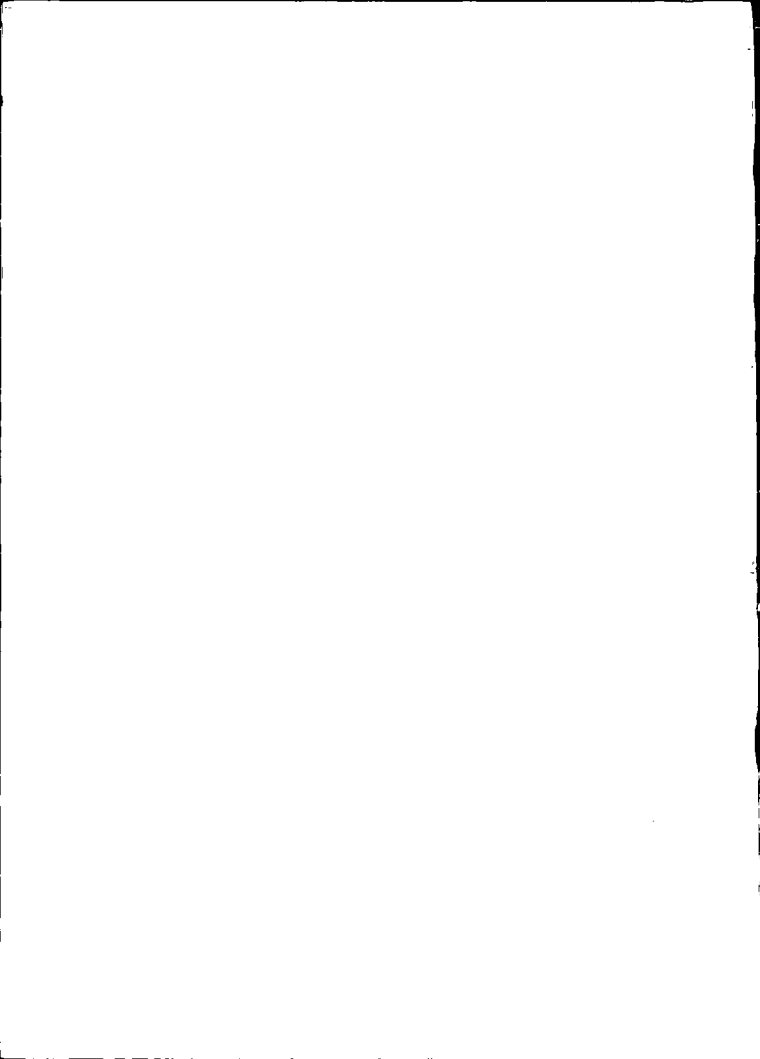
When it comes to understanding what determines the entrepreneur's investment decisions, Kalecki is highly critical of *GT*, concentrating on the weaknesses of the marginal efficiency of capital (MEC) analysis in Chapter 11: rejecting the implied rising marginal cost curve of capital goods industries and recognising that higher capital goods prices only relate to *ex post* investment when the MEC is supposed to deal with *ex ante* decisions of investment. Kalecki approves of the Chapter 12 notion that the state of LTE of entrepreneurs strongly influences the MEC calculations. Looking for the cumulative investment process that leads to a dynamic, but precise, solution to the investment problem along the lines of his own investment cycle model, Kalecki sees the expectations discussions in Chapter 12 as a side issue, since it all feeds back into a 'basically static' MEC approach, when the investment decision 'is by its nature dynamic' (Kalecki 1982, 252).

This critique of investment analysis reflects the period it was written, as well as Kalecki's own search for a precise mathematical formulation of the cumulative investment cycle. The behavioural approach to economics in 1936 was not appreciated or even understood by economists (except by those on the fringes close to sociology, like Veblen). Kalecki's diachronic cycle mechanism institutionalises uncertainty as an unstable 'increasing risk' factor, eschewing epistemic factors related to the behavioural, or motivational, aspects of entrepreneurs' decision-making (Courvisanos 1996, 69-72).

3. Keynesian Analysis of Investment

Two paths have been followed in the macro-investment analysis since Keynes. The conventional neoclassical path is to adapt the MEC concept by incorporating into Keynes's present value a maximisation objective. This objective is subject to a production function where the flow of output is a function of the cost of both labour and capital services relative to output price. It specifically centres firms' investment demand in optimising micro-firm behaviour within an explicit perfect competitive fully employed economy. Investment by businesses ought to result in a stable function as the calculations are based on accurate long-term future rates of return. For this reason, the observable cyclical nature of investment can only be due to external shocks. As noted in a classic first year textbook, '[p]rimary causes of these capricious and volatile investment fluctuations are found in such external factors as (1) technological innovation, (2) dynamic growth of population and of territory, and even in some economists' view, (3) fluctuations in business confidence and "animal spirits".' (Samuelson 1980, 246)

The alternative path is to accept cyclical fluctuations as inherent to market economies, and establish how the MEC can be affected by effective demand and planned capacity of means of production (MOP), which then produce unstable investment. This specifically centres firms' investment demand in a oligopolistic competitive structure, where time lags and irreversibility force firms to use their market power to overcome the uncertainties of unstable demand and inflexible capital stock quantities. This Keynesian approach develops along Kaleckian micro-foundations. Investment by businesses results in an unstable function as calculations are based on a climate of confidence, in terms of the potential benefits of new MOP, which varies



according to demand factors and the related use of the capital stock in existence. Flexible accelerator-type models (based on output or profit) with cash-flow financing constraints epitomise this path.

The neoclassical investment analysis path, based on firm profit optimisation, has been dominant in economics. There are two major variants of this approach. One is the user cost of capital model, pioneered by Jorgenson (1963). This model concentrates on the average long-term behaviour of investment '...as determined by the requirements that the expected returns over the life of a project exceed its cost' (Zarnowitz 1985, 536). Such an approach can not capture the short-term effects of supply price rises emphasised by Keynes (1936, 122-5) nor the expectational effects '...which are not distinguishable from the gestation periods or delivery lags' (Zarnowitz 1985, 536). Then, this model aggregates the micro-investment function with a distributed lag stock-adjustment hypothesis which is *ad hoc* and inconsistent with the neoclassical assumptions of perfect knowledge and, thus, no adjustment costs (Junankar 1972, 60).

Empirical studies have generally shown the cost of capital model to have little correlation with the actual investment patterns of economies (Dornbusch and Fischer 1984, 222; Sawyer 1982, 156). Clark (1979, 104) argues that aggregation problems and slow adjustment of the capital stock, and not defects in the theory, account for the poor overall performance of the neoclassical model. Yet, these very same problems are what the theory itself can not handle as it proceeds from firm to macro-level.

The other variant of the optimising approach is the q theory pioneered by Tobin (1969). It provides a strong theoretical challenge because of its attempt to incorporate Keynes's own analysis of share (stock) price instability (1936, 147-64) into fixed investment volatility and its relatively simple use of observable aggregate variables (Hall 1990, 52). Zarnowitz (1985, 536) gives a substantial list of research to support the view that this '...hypothesis has not fared well in empirical tests.' An attempt to use q theory to explain aggregate investment by McKibbin and Sieglöff (1988, 214) explains only ten per cent of the predicted investment by q theory. The other 90 per cent are explained by an *ad hoc* incorporation of the profits theory in non-optimising behaviour. This latter addition is inconsistent with the optimising assumption of q theory.

One strength of the neoclassical approach, both cost of capital and q theories, is the rigorous microeconomic investment function which it develops. It is favoured for textbook and classroom expositions since both theories can be grounded more formally into an overall economic model of the economy than the alternative approach (Poterba 1988, 200). What is lacking from the alternative path, as Kalecki makes clear in the opening quotation of this chapter, is a microeconomic theory of investment behaviour which is based on the cyclical nature of aggregate investment and business cycles. A rigorous construction at the firm and industry level is needed to supplement all the rigorous work done at the macroeconomic level to provide aggregate investment functions which are consistent with the empirical evidence noted above. This is particularly the case where the Kaleckian macro-investment analysis has reaped impressive results in the 1980s (Del Monte 1981; Stegman 1982; Fazzari and Mott 1986-7; Fazzari et al. 1988; Chamberlain and Gordon 1989).

From the alternative path, when linking macro-cyclical activity with micro-firm behaviour, it is critical to eschew any backsliding towards exogenous explanations. In the Samuelson quotation above listing the 'external factors', one of them should be internalised into firm behaviour - 'animal spirits', while another has crucial internal firm dynamics - 'technological innovation'. Samuelson, two paragraphs later, states that bringing inventions into the production process '...will most certainly depend on business conditions' (1980, 246). Keynes (1936) and Schumpeter (1939) in their respective views of 'animal spirits' and 'innovation' thought them to be internal. Both fell back to some exogenous initiating force in order to preserve their

endogenous equilibrium models (on Keynes, see Levine 1984; on Schumpeter, see Sylos Labini 1984). The argument, presented in much detail by Courvisanos (1996, 94-112), is that these factors relate to firm behaviour and need to be fully developed into a behavioural model which is incorporated into a microeconomic institutional framework. This framework must allow for internal instability to be generated without worrying about inherent stable equilibrium. Kaleckian micro-foundations based on monopoly power and not perfect competition provide such an institutional setting.

4. **Keynes's Analysis of Investment: Modern Behavioural Interpretations**

The search for a microeconomic theory of investment behaviour to supplement the Kaleckian institutional micro-foundations have led back to Keynes's *GT*. Chapter 12 in particular has been re-examined with the benefit of work done on Keynes's theory of uncertainty begun by Coddington (1982) and the response from Lawson (1985). This search emphasises firms' investment decisions. A situation recognised by Keynes as one where the '...entrepreneur is interested, not in the amount of product, but in the amount of money which will fall to his share.' (Keynes 1979, 82) Thus, the concept of 'the entrepreneur economy' by Keynes in his rough draft of *GT* can be understood.

Keynes has two models of investment decision-making in *GT*. The first one is the MEC analysis in Chapter 11, which is a formal equilibrium model of investment that aims to show the possibility of crisis due to the breakdown of Say's Law, when the objective MEC calculations make investment unattractive and hoarding occurs. Neoclassical economics has taken this model and incorporated it into its mechanistic econometric view of investment, which makes the investment function internally stable and dependent on exogenous factors for its volatility, as outlined in the previous section.²

The second model of investment by Keynes is in Chapter 12. The concern here is to account for the observed volatility in investment. The 'entrepreneur economy' developed in Keynes's early draft surfaces in this informal analysis when a particular group within society takes on investment as a 'way of life' (1936, 150). Based on this strong classical perspective, Keynes argues that a speculative MEC emerges from the introduction of financial markets. The speculative MEC, reflecting '...a prediction of short-run majority opinion in the [financial] market place', diverges from the objective MEC '...in the latter stages of a boom and during the contraction phase of the trade cycle.' (Burkett and Wohar 1987, 41). Thus, short-term expectations undermine fundamental [objective] long-term expectations that go into investment strategies. This model received strong impetus a year later in the opening remarks of Keynes (1937) about uncertainty inherent in investment decisions which lead to variations in aggregate expenditures.

This is the starting point for all modern behavioural investigations of Keynes's investment theory. By highlighting the role of psychological factors in the determination of investment, Keynes brought behavioural motivation to economics (Earl 1988, 13), not just in terms of assumptions, but also as central to the economy's progress over time. Keynes's analysis of uncertainty is the essence of this behavioural element in investment. Where Keynes has been open to criticism is in his approach to uncertainty.

There is a strong classical behavioural perspective in *GT* based on the role of the entrepreneur. In fact, the concept of the 'entrepreneur economy' is developed in Keynes's early draft of *GT* and is applied there to an oligopolistically competitive economy (Sardoni 1987, 133). This surfaces in the published book form only in an informal description when at the beginning of the chapter Keynes refers to '...business as a way of life' (1936, 150). Within this framework Keynes starts this enquiry into uncertainty where Kalecki had left off. Both economists agree that investment decisions are based on entrepreneurs' rationality which is

guided by past and present experiences (the diachronic mechanism).³ This mechanism constrains the imagination of entrepreneurs; in this situation, it is the only response perceived as rational. Thus, when making investment decisions, entrepreneurs ensure that '...the facts of the existing situation enter, in a sense disproportionately, into the formation of...[their] long-term expectations' (Keynes 1936, 148).

Keynes first examines the state of confidence entrepreneurs have with regard to the long-term expectations (LTE) formed from past knowledge. Recent studies of Keynes's uncertainty concept all agree that conventions, or simple rules, are established as devices for building the degree of confidence with which investment decisions are made (Earl 1988, 13).⁴ Keynes's 'chief' convention '...is to assume, contrary to all likelihood, that the future will resemble the past.' (Keynes 1973, 124) This attempts to preserve stability in an uncertain world. Business practices (like mark-up pricing, discounted cash flow and pay-back rules) are established around these conventions, with different institutional frameworks giving rise to different specific motives and rules.

Keynes then introduces the concept of speculative rationality based on short-term financial gains by 'outwitting the psychology of the market' and anticipating its movements which are governed by doubt and fear (O'Donnell 1989, 258). Investors' convention is undermined by increased lack of confidence which leads to enterprise giving way to speculation (or 'animal spirits'). Uncertainty surrounding LTE makes new capital formation illogical, the implication being that entrepreneurs act to protect their liquidity position, while speculation abounds.

Volatility to Keynes is not disorder, but order which is disturbed when the continuity of stable LTE becomes precarious. 'What Keynes is emphasizing is the *susceptibility* of LTE to change; how frequently they do change and to what degree is an important but largely empirical matter.' (O'Donnell 1989, 262, original emphasis) The extent of susceptibility to investment decisions is a theoretical notion which determines whether or not there is volatility in investment activity. Lawson (1985, 921) argues that Keynes's investment instability stems from structural breaks, when 'moments of crisis' in confidence over reasonably steady LTE and existing conventions disrupt accepted business practices. This leads to a period of 'adaptive learning' or re-adjustment, '...before the process can settle down to one of knowledgeably reproduced social practices' (Lawson 1985, 922).

The exogenous role of uncertainty in investment volatility, as outlined by Keynes, is seen by Levine (1984) as inherently weak because it fails to carry through the classical idea of enterprise. Instead, Keynes falls back on the neoclassical notion that the financial market is populated by individual wealth-holders. Keynes's '...long-term expectations are, thus, exogenous, because they cannot be definitely related to any current economic variable.' (Carvalho 1988, 80) Under this assumption, firms end up using the same criteria as individual investors in deciding how to dispose of liquid assets. This ignores the '...fixity of investment within an irreversible flow of time, and the force of competition' (Levine 1984, 49), both which constrain firms' investment decisions. Levine sees past investments affecting both the current use of funds and the difficulty of liquidating existing capital stock. Once set on a path of business development, past investments limit options for future investment. Also competition, and the threat of competition, can erode market position and constrain '...the firm to funnel financial resources into the preservation and expansion of existing capital investment in particular lines even when greater short-term profits could be made by speculation.' (Levine 1984, 49)

A recent area of investment uncertainty research within neoclassical analysis follows this fixity and irreversibility of investment to optimally constrain entrepreneurs in delaying investment projects until additional information is obtained (see Bernanke 1983; Pindyck 1991; Abel *et al.* 1996). Business cycles that stem from this investment uncertainty are based on taking '...uncertainty to be completely exogenous to the economic system; the investment fluctuations

created by this uncertainty provide (in the terminology of Ragnar Frisch) an "impulse" to cyclical swings.' (Bernanke 1983, 103-4) This approach takes the classical role of enterprise behaviour into the exogenous role of investment uncertainty.

Anderson and Goldsmith (1996, 6, fn 14) see this approach as '...consistent with Keynes' theory of investment'. This can be justified only by making the various uncertainties arising out of the classical notion of enterprise into weight-adjusted risk values which can then be placed into an algorithm for optimising the investment function. The result is an 'ergodic axiom' to which agents draw samples from the past or present, assume that such samples are equivalent to drawing samples from the future, and then place them into an optimising algorithm. 'Keynes (1936, 147-8), however, rejected the ergodic axiom as applicable to all economic expectations when he insisted that the "state of long term expectations" involving nonroutine matters that are "very uncertain" form the basis for important economic decisions involving investment, the accumulation of wealth, and finance.' Davidson (1996a, 493) This is ontological uncertainty, where human decision processes can not be reduced to algorithms.

Levine (1975) has a self-expansion perspective of firm development based on Schumpeter's capitalist entrepreneurial class. This investor class are affected by the uncertainties of financial markets, but their objective is the firm's survival. Capitalists have a strategic interest in their firms. A Kaleckian class-based institutional framework, with capitalists as central ('masters of their fate') to the entrepreneur economy, can provide a structure which can then be developed to account for both oligopoly behaviour in goods markets and speculative behaviour in financial markets. This endogenous approach to ontological Keynesian uncertainty is developed in the following section.

5. An Endogenous Approach to Investment Uncertainty: The Susceptibility Cycle Model⁵

Increased susceptibility of LTE to change is the mirror image of decreasing confidence in existing practices. This happens when the 'weight of argument' lowers due to entrepreneurs increased incompleteness of knowledge (or information). In this sense increased uncertainty is related to lower weight. Low weight renders beliefs, based on established conventions, sensitive to new information and induces investors to try new conventions. This is the basis of Keynes's epistemic instability of beliefs, which can be reinforced and magnified by institutional features in financial markets and in technological change (Runde 1991, 142-3).

Keynes's 'weight of argument' can be used to augment the Steindl (1941) notion of 'subjective attitude to risk'. In Steindl's analysis, the three cyclical variables in Kalecki's investment model - profits, excess capacity, increasing risk (see Laski 1987, 10-11) - inform the entrepreneurs on their 'subjective attitude'. This leads to raising or lowering the 'weight of argument', depending on how these variables are changing. For example, the 'weight' of entrepreneurs' subjective attitude to risk would be lowered by reduced profits. In this way, Keynes's concepts of uncertainty and susceptibility can be linked to the Kaleckian framework.

Investment instability based on 'weight of argument' places the accent on uncertainty, which has a numerically immeasurable probability. Keynes, like Kalecki, accepts that uncertainty which has a measurable probability should be incorporated into investment project evaluation as a risk premium. Such risk calculation is consistent with Knight's view of probability (O'Donnell 1989, 263). Kalecki's 'increasing risk' attempts to take the 'preference for safety' element of uncertainty out of what Keynes and Knight regard as immeasurable, and give it a more institutional focus in investment instability analysis. However, Kalecki's principle is essentially a behavioural convention about constraints on financing investment which increase as the 'weight of argument' falls (and vice versa).

Keynes's epistemic instability of beliefs is developed, with Minsky's work on euphoric (Ponzi-style) behaviour followed by financial fragility and collapse (see Minsky, 1982), into a cumulative process of expansion and contraction in investment decision-making. Then, by introducing Simon's (1987) convention-based satisficing behaviour, a specific kaleidic susceptibility to expectational changes in investment is conceived. This makes investment decisions highly sensitive and subject to change. Decisions are regularly revised to satisfy changing expectations, while investment orders at the implementation stage are subject to modifications and delay.

Susceptibility refers to the psychological tension felt by entrepreneurs in relation to their fragile confidence about a particular investment decision, given the level of investment orders already committed. The fragility of this confidence in convention-based investment decisions explains unstable investment behaviour. Increasing fragility arises when tension related to current investment decisions escalates as confidence is eroded. This cumulative process renders entrepreneurs' confidence increasingly fragile (or sensitive) as investment order levels rise. When investment order levels are falling, cumulative pressures are being eased on the fragile confidence of entrepreneurs. In this formulation, the level of investment orders is susceptible to change. This susceptibility is a function of the tensions generated by the degree of fragile confidence felt by entrepreneurs from exposure to risk and uncertainty.

The fragile confidence formed by entrepreneurs in their investment decisions is based on the objective evidence from the three Kaleckian elements (profits, increasing risk and capacity utilisation) identified as central to investment. Growth, in terms of firm size or market share, is the wellspring that dominates optimistic confidence formation. This drive for growth, built on the three Kaleckian elements, is the *raison d'être* of investment. A firm also aims to '...avoid threats to its decision-making autonomy or its financial security' (Crotty 1992, 491). This safety objective erodes confidence when the three Kaleckian elements provide information that the push for growth has resulted in serious safety-threatening problems. At such a level of investment orders, further planned investment commitments are increasingly susceptible (or prone) to postponement and even (if the threat to safety is perceived as serious enough) modification or cancellation of current orders.

The cumulative building up and easing down of tensions ensue from the objective data of the three Kaleckian elements, giving rise to what Courvisanos (1996) calls 'susceptibility cycles'. These cycles map the feelings of susceptibility in relation to current investment decisions that originate in the building up of tension as businesses are exposed to more uncertainty and higher costs, and the breaking down of tension as businesses are exposed to less uncertainty and lower costs. In all cycles, explanation of turning points is crucial. Turning points in susceptibility cycles occur when entrepreneurs' susceptibility is such that current conventions used for investment decision-making are rejected, leading to structural breaks in patterns of investment behaviour. This echoes Keynes in his view that '...a conventional judgement...is subject to sudden and violent changes...[when] certainty and security, suddenly breaks down' (1937, 214-5, original emphasis). The difference is that with Keynes such breaks are exogenously induced, while in this susceptibility analysis they are endogenously based on given levels of investment orders already committed.

It is important to appreciate the asymmetry between the susceptibility to changes in investment orders in the expansion and contraction phases. While increasing susceptibility provides the basis for the explanation of an endogenously generated upper turning point, it is the receptiveness of entrepreneurs at low susceptibility to take greater risks when the costs of postponing new investment projects become large that induce an increase in investment orders.

Investment behaviour is susceptible to specific factors which are based on the distinctive capitalist institutional structure of a particular economy. Susceptibility cycles vary with different economies and over different historical periods because each economy's institutional structure at

a particular historical point affects the endogenous and exogenous factors differently. The analytical implication of this susceptibility view of Keynes's uncertainty is the need '...to devote more resources into [sic] learning about institutional behaviour, norms, conventions - or, more generally, rule systems - that are produced and reproduced by people' (Lawson 1985, 925). Lawson explains that such learning requires interpretative analytics to be conducted on practical primary source material derived from case studies and personal histories. Empirical patterns based on such research is set out in Courvisanos (1996, 190-216).

A historically situated susceptibility cycle is best understood in terms of entrepreneurs' relative proportions between spontaneity and constraints on human action (Oakley 1993, 12-15). The former refers to Keynes's animal spirits with '...sudden and violent changes' in response to structural breaks, while the latter refers to the 'rules of the game' in Keynes's 'entrepreneur economy' that constrain action.⁶ In periods of strong recently established technological systems with a state responsive to planning and stabilisation, relative proportions lean towards 'rules'. This produces moderate amplitudes in investment cycles with relatively strong growth rates (subdued susceptibility cycles). In periods of declining relevance of older established technological systems with a State that is market forces oriented, relative proportions lean towards sudden changes. This produces larger amplitudes in investment cycles with more moderate growth rates (pronounced or severe susceptibility cycles).

The susceptibility cycle model takes the basic theoretical model and incorporates the historical structural changes that accompany various stages of firm development. Endogenous based increasing and decreasing susceptibility merges with exogenous influences which can intensify or ameliorate susceptibility. In specific historical situations, this produces subdued, pronounced or severe susceptibility cycles which determine the extent of investment volatility. This creates path-dependent and cumulative investment cycles which are organic and evolving (as against deterministic and optimisingly predictable neoclassical cycles). Complexity theory (see Waldrop 1992) argues that it is through relating uncertainty to historical explication (with accompanying learning and positive feedback) that enriches purely theoretical formulation. Empirical analysis enhances the theoretical propositions, developing a closer approximation to understanding behaviour which is not directly observed.

6. Keynes and the Socialisation of Investment

Accepting the endogenous approach to investment uncertainty outlined in the previous section as consistent with Keynes's own analysis of investment cycles, leads to the policy-oriented conclusion that the role of investment in a deregulated environment with quickly changing technological systems must lead inevitably to strong susceptibility and thus a high level of investment volatility. Under such conditions, the period of future based expectations is shortened, with concomitant shorter payoff periods and larger expected returns. This exacerbates susceptibility, with very limited amelioration from any state support. Planning for large long-term investment projects is sacrificed for smaller shorter-term investments which can weaken investment growth and pull the trend of capital stock growth down. It is this concern that leads Keynes (1936, 378) in his own conclusion to the need for the State to '...exercise a guiding influence ... through ... a somewhat comprehensive socialisation of investment'.

Keynes argues that this proposal should only be implemented if demand management and industry policies to ameliorate large swings in investment cycles do not succeed. To Keynes, this would occur because '...the long-run behaviour of businessmen proved intractable and irresponsible in the face of government attempts to achieve different objectives' (McFarlane 1982, 84). This impels the State directly to organise investment by calculating '...the marginal efficiency of capital-goods on long views and on the basis of the general social advantage' (Keynes 1936, 164). The aim is to establish strong conventions that reduce susceptibility and

increase capital stock growth rather than any notion of public ownership patterns, which Keynes expressly rejects. Kalecki concentrated much of his latter years' research on how the State could technically accomplish this.⁷ He regarded central planning of investment '...the biggest role to play in delineating the economic patterns to be pursued' (McFarlane 1971, 104).

In essence, State organisation of investment would aim to prevent overaccumulation and Ponzi financing. This should strongly ameliorate endogenously-based susceptibility, but not overcome instability from exogenous factors. Whereas Keynes believed that such planning could be done by the State as an impartial 'referee', Kalecki saw the capitalist State's priority as protecting capitalist interests through the political business cycle which would exacerbate the endogenous susceptibility elements.⁸

Maintaining an exogenous approach to investment uncertainty leads to the neoclassical world of Chapter 11 in *GT*, which Kalecki severely criticised back in 1936. From such an approach, uncertainty in Chapter 12 can be incorporated into a risk-adjusted computer-based algorithm. This provides an optimising investment function that can then be used consistently in a standard neoclassical micro-firm behavioural model. 'Socialisation of investment' under these circumstances becomes a meaningless policy implication and can be ignored (as it has been by generations of mainstream economists).

'Socialisation of investment' in *GT* can only be considered as a relevant policy implication if the endogenous approach to investment uncertainty is adopted. This involves accepting Chapter 12 as an integral part of a behavioural model which acknowledges the non-ergodic circumstances that form a path-dependent, cumulative, organic and evolving process. This model can be seen as part of the emerging Complexity theory, with a clear 'proactive role for governments' (Elliott 1996, 11). This role needs to be developed in a viable, flexible and perspective plan within the context of the above dynamic process created through uncertainty.

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Notes

1. This message of 'investment begets saving' has been completely turned around in the popular press of the 1990s, with business people, politicians and newspaper-writing economists all calling for programmes to increase the flow of saving by reducing government spending (see Switzer 1997). It is no coincidence that Keynes's message has been 'lost' when respected mainstream economists like Mankiw describe *GT* as 'an obscure...[and] outdated book' (1992, 560). See responses to this problem by Harcourt (1992), Dimand (1995) and Davidson (1996b).
2. This type of research continues to dominate the mainstream literature. An extreme example is where rational expectations is the human agency behavioural assumption incorporated into a standard Keynesian multiplier-accelerator model to show using econometrics that business investment is a counter-cyclical 'automatic stabiliser' which acts as 'a powerful source' for stabilising the business cycle. Thus, '...the fundamental cause of macroeconomic instability lies, not in investment, but in the unpredictability of the autonomous spending of government and consumers.' (Coleman 1996, 29-30)
3. Keynes's rational economic person is wider than the conventional neoclassical view of rationality which is purely based on known and measurable probability, even if that measure is less than full certainty. The bulk of Keynes's discussion on uncertainty relates to known probability relations, but which are 'numerically immeasurable' (Lawson 1985, 914).

4. See - in alphabetical order - Carvalho (1988); Fitzgibbons (1988); Lawson (1985; 1990); O'Donnell (1989); Runde (1991).
5. This section is a very brief outline of a model developed in detail by Courvisanos (1996). A very similar outline, but without the discussion of Complexity theory, is presented in Courvisanos (1997).
6. These dynamic elements of Keynes have been recently identified as historical precedents for Complexity theory (Elliott 1996). This theory has received increasing attention from economists who recognise the role of evolution and change within bounded rational human agency constraints. This can be seen as weakly chaotic economic systems that emerge out of self-organised critical path dependency (Elliott 1996, 8). An excellent introduction to this emerging science is Waldrop (1992); while Arthur (1989, 1990, 1994) has been the most significant and prolific author writing on Complexity theory in economics.
7. See many of the articles in Kalecki (1972) and (1986). Kalecki (1963) sets out the structure of investment in terms of decision-making with constraints from the capital goods producing industries. Kalecki (1957) concentrates on problems in the construction period of investment. Nuti (1986) provides an excellent modern reinterpretation of Kalecki's theory and practice of planning with social control of investment as its central focus. USA commentator, Alexander Cockburn revives this approach in a 1991 issue of *New Statesman*: '...the Left has to argue a case it has virtually let go by default for 20 years: the social control of investment, the "socialisation" of the market, in which democratic investment planning represents the popular will, as against the corporate drive for profitability' (as quoted by Walsh 1991). Cockburn believes that this new socialism should be based around the ecological concerns of the public, or what he calls eco-socialism.
8. For this reason Kalecki's central planning of investment is conducted under a broad perspective plan within a socialist political structure (see Nuti 1986).

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