Neoclassical and Keynesian approaches to the theory of investment

JAMES R. CROTTY: 1993[*]

The main conclusion of Myron Gordon's essay is that all five of the core propositions of neoclassical investment theory he identifies are "false," a conclusion that raises a fascinating question: How can an economic theory based on universally false propositions dominate the economics profession?

The simplest and most compelling answer is ideological in character. Neoclassical theory is the concrete theoretical embodiment of a powerful, overarching "pre-analytic Vision" (to use Schumpeter's term) of capitalism as an economic way of life - a metatheoretical, intuitive grasp of the essential properties of an unregulated capitalist system that is overwhelmingly supportive of it. As such, it *must* be a theory of how markets efficiently coordinate the decisions of atomized agents, creating coherence and optimality where chaos might otherwise have been. Neoclassical investment theory has adopted the particular assumptions Gordon criticized because they are necessary for the construction of a theory of investment that can sustain the system-wide stability and optimality properties that are the hallmark of the neoclassical worldview.[1]

In the remainder of this essay I discuss the relation between three core neoclassical assumptions and the Vision-sustaining properties of neo-classical investment theory. After explaining why these assumptions should be rejected, I speculate about the characteristics of an alternative Keynesian investment theory based on a more realistic assumption set. The critique offered here is sympathetic to but distinct from the one presented by Gordon.

Three core assumptions of neoclassical investment theory

The objective function of the enterprise

The separation of ownership and management in the modern corporation, a phenomenon that Keynes saw as the root of many of the problems of modern capitalism, created a principal-agent problem that is difficult if not impossible to resolve. Neoclassical financial theorists have made acrobatic theoretical efforts to defang the principal-agent problem so that the Pareto-efficiency properties of markets could escape unscarred from its grasp.[2] Unfortunately, the assumptions required to accomplish this task have no significant foundation in empirical or

---

[1] I do not mean to suggest that neoclassicists are oblivious to the existence of potential impediments to Pareto-optimal outcomes. My point rather, is that a stable position of market-clearing general equilibrium is typically seen as the center of gravity of a competitive market economy, the point to which the system will be attracted in the absence of some contingent market failure. As such, competitive general equilibrium is the analytical and ideological heart of neoclassical theory, its short answer to the question, "What is a free market economy really like?" For this reason, investment models that fit comfortably within this system, such as Jorgenson's user cost model or Tobin's q theory, dominate models, such as the irreversible investment models discussed below, which do not. My comments in the following two sections are addressed primarily, though not exclusively, to such Vision-sustaining models.

[2] See, for example, Fama (1980), Jensen and Meckling (1976), and Fama and Jensen (1983).

institutional reality. Stiglitz has accurately characterized the neoclassical principal-agent literature as "the triumph of ideology over theory and fact" (1985, p. 134).

Neoclassical investment theory, on the other hand, fails even to acknowledge the existence of the problem. Virtually all neoclassical models of the enterprise investment decision begin with the unsupported assertion that the firm's objective *is* pursuit of the owners' objectives: the firm maximizes market value. Three points about the value maximization assumption are worthy of note. First, there is a great deal of empirical and institutional evidence that this assumption is false and virtually no *direct* empirical evidence that it is true.[3] Second, if this highly questionable assumption is rejected, it is not at all clear that a distinct neoclassical approach to the theory of the firm can be identified. In its absence, neoclassical theorists have no generally agreed upon method for choosing an enterprise objective function, for specifying the constraint set, or even for identifying the cost of financial capital. Third, if firms are partly independent or semiautonomous from their owners and can make investment decisions that run counter to shareholders' perceived interests, there is no wealth holder control of, or "sovereignty" over, the capital accumulation process and no mechanism to assure optimal coordination between the real and financial sectors of he economy. Thus, when management is semiautonomous, the real sector becomes semiautonomous as well, a result that is inconsistent with the neoclassical Vision.

In Crotty (1990a), I argued that the relevant non-neoclassical literature (managerial, behavioral, and institutional) characterizes top managers of large nonfinancial corporations as concerned with the long-term reproduction, growth, and safety of the firm itself. By achieving these objectives, managers assure their own status and security. The constraints they face derive in part from their desire to retain decision-making independence from financial market "constituents"- stockholders and creditors. For the "managerial" firm, dividends, like interest payments, are a cost of maintaining managerial decision-making autonomy, a constraint rather than an objective to be maximized. Thus, an acceptable investment theory requires the specification of the firm as a partially independent or semiautonomous economic agent with a preference function of its own.

This characterization of owners and managers is broadly consistent with Keynes' own view. Keynes theorized owners and managers as distinct agents with different objectives and planning horizons - the former seeking short-term capital gains, the latter the long-term viability and growth of the enterprise itself, and significantly different degrees of knowledge about the firm and its environment - the former are relatively ignorant, the latter are professionally well informed. Keynes also stressed the fact that, while owners hold liquid financial assets, firms accumulate relatively illiquid physical capital.

Neoclassical risk or Keynesian uncertainty?

In the first footnote in his essay, Gordon notes that Post Keynesians have "correctly" rejected the way in which neoclassical investment and financial theories represent agent knowledge of the future. He does not, however, carry this critique into the body of the paper and does not substitute an alternative Keynesian assumption about agent knowledge of the future in his suggested Keynesian investment model. Yet, as Gordon knows, the choice between

---

[3] See, for example, the reviews in the *Journal of Economic Literature* by Cyert and Hendrick (1972), Marris and Mueller (1980), and Williamson (1981) as well as the widely cited study of decision making in large industrial corporations by Donaldson and Lorsch (1983) and the discussion in Crotty (1990a).

neoclassical and Keynesian assumptions about knowledge of the future profoundly affects the character of both investment and financial theory.

Neoclassical theory does indeed adopt the untenable assumption that agents can assign numerical probabilities to all possible future economic states and, therefore, can associate a probability distribution of expected returns with every possible choice available to them. Stretching credulity still further, it adds the truly heroic assumption that agents are absolutely certain that these probability distributions are *knowledge* - the truth, the whole truth, and nothing but the truth about the future consequences of current agent choice. The universal adoption of this logically and empirically repugnant assumption can only be understood as "the triumph of ideology over theory and fact."

Keynes' views about uncertainty have been explored at great length by Shackle, Vickers, Davidson and others. For Keynes, the information needed to make an optimal investment decision - the future net revenues that will be generated by each potential investment project - does not exist and therefore cannot be known at the moment of choice. It is not "out there" for agents to find. For Keynes, the future is created by current and future agent decisions that are inherently unpredictable: "About these matters there is no scientific basis on which to form any calculable probability whatever. We simply do not know" (Keynes, 1937, p. 214). Nonetheless, firms and wealth holders *must* make investment and portfolio selection decisions; they cannot avoid the decision- making dilemma created by Keynesian uncertainty. "We do not know what the future holds. Nevertheless, as living and moving beings, we are forced to act" (Keynes, 1973, p. 124).

Thus, in a world of uncertainty there is an *empty space* in the logical chain linking agent characteristics and hard data to agent decisions. Neoclassical theories of rational choice are impotent in this environment because their very definition of rationality assumes that agents have complete and correct knowledge of the effects on outcomes of all possible rival courses of action. Where the information required to connect decision to outcome is incomplete and undependable, neoclassical theories have nothing – literally - to say.

Keynes, by way of contrast, outlined a solution to this problem: he adopted a theory of *conventional* decision making.[4] Keynes theorized an expectations formation process based on custom, habit, tradition, rules of thumb, instinct, and other socially constituted practices.[5] He argued that in "normal" times at least, agents base their forecasts on conventional assumptions such as: (1) the future will look like the relevant past extrapolated ("modified only to the extent that we have more or less definite reasons for expecting a change" [Keynes, 1936, p. 148]); and (2) while individual agents understand themselves to be inescapably ignorant of the future, the collective or average opinion or the "conventional wisdom" is seen as reasonably or even scientifically well informed.

Conventional expectations formation creates or imagines the previously missing data needed to link rival choices to expected outcomes. More important, conventions create

---

[4] See Crotty (1991b) for an analysis of uncertainty, conventional decision making, and conditional stability in Keynesian macromodels.

[5] Such socially constituted conventions arise in part because human beings have a deep-seated psychological need to impose order and controllability on their environment when they are able and even to pretend to see order and predictability when it is not there. "Peace and comfort of mind," Keynes noted, "require that we should hide from ourselves how little we foresee" (1973, p. 124).

confidence that the expectations thus formed have a degree of meaningfulness or validity or truth-content sufficient to sustain an investment or portfolio decision of great moment for the agent. This creation of confidence in the meaningfulness of forecasts or in the "scientific" character of the conventional wisdom is essential to both the growth potential and the conditional stability of the economy. No rational management would undertake a large, risky investment project on the basis of an optimistic forecast in which it had little faith. In concert with the private and public institutional structures that guide economic activity and set bounds on expected future outcomes, *conventional decision making creates a significant degree of continuity, order, and conditional stability in a Keynesian model* in spite of the potential for chaos and perpetual instability seemingly inherent in the assumption of true uncertainty. It is simply not true, as Lucas has argued that "in cases of uncertainty, economic reasoning will be of no value" (1981, p. 224).

On the other hand, social conventions are inherently "fragile" and "subject to sudden and violent changes" (Keynes, 1937, p. 215). On those occasions when the consensus forecast turns out to be disastrously mistaken, knowledge of the irreducible ignorance of even the collective wisdom will break through the conventional barriers we have constructed to conceal it from ourselves. At such times, confidence in the meaningfulness of the forecasting process will shatter, and key behavioral equations may become extremely unstable. These are the points of crisis and panic that have pride of place in Keynesian, Minskian, and Marxian theories of investment instability, but are prohibited by assumption in neoclassical investment theory because they are incompatible with its Vision.

Physical capital as a liquid asset: reversible investment

All neoclassical investment models that are demonstrably consistent with the overarching neoclassical Vision of a well-coordinated and efficient system of markets assume that long-lived capital assets have perfect or near perfect resale markets. Jorgenson's model and Tobin's *q* theory are the two most important examples. With perfect resale markets the neoclassical investment decision is as riskless and reversible as the decision to hire a worker.

The liquidity of capital finds reflection in the neoclassical concept of a user cost or a "rental price" for capital goods. Neoclassical firms are indifferent between owning and renting their capital: in either case they are paying only for capital "services." But renting capital goods is not a very risky business. If expectations turn out to be disappointed by the unfolding of events, the firm can always resell the goods or choose not to renew its rental agreement at the end of the period. With liquid capital, the beyond-first-period future is not particularly relevant, so neither is the degree of uncertainty. And when investment is reversible, financial commitments are reversible as well. Capital goods can always be resold to retire the debt that financed them and there is no "legacy of past [debt] contracts" to burden the accumulation process (Minsky, 1982, p. 63).

Thus, *the firm faces no sunk costs, no intertemporal profit trade-offs, and no irreversible debt burdens.*[6] With liquid capital goods, even the prospect of bankruptcy, which would be devastating to management, would be of slight concern to owners because it would cost them little. The assumption of reversibility robs uncertainty of its sting because it renders mistakes

---

[6] According to standard neoclassical theory, then, in the absence of adjustment costs, General Motors should invest its market value in Treasury bills whenever short-term interest rates exceed the profit rate in the auto industry, then sell the T-bills and buy or rent car-producing capital goods when the situation reverses itself.

relatively costless.[7] How much effect can the unknowability of the future have on the investment decision of a firm that can get its money back (minus one period's depreciation) if that decision turns sour?[8]

The modest mainstream literature dealing with irreversible investment that has emerged over the past decade is a welcome first step toward the development of a more realistic investment theory.[9] However, these investment models cannot yet serve as a foundation for the neoclassical Vision. For one thing, this literature formally demonstrates that irreversibility "undermines the theoretical foundation of standard neoclassical investment models" (Pindyck, 1991, p. 1110). For another, no one has yet analyzed the properties of an economic *system* incorporating an irreversible investment function (and the underutilized capital stock that would accompany it). Unless and until it can be shown that these models are consistent with the neoclassical Vision, they will remain at the margin of the neoclassical investment literature. Unfortunately, these models cannot yet make a major contribution to Keynesian macrotheory either because they are forced to rely on almost all of the standard, grossly unrealistic neoclassical efficient-markets assumptions in order to make the extraordinarily complex problems they construct analytically tractable.

Any model of the investment decision with a serious pretension to realism must assume with Keynes that capital accumulation is an inherently risky process because many capital goods are substantially industry-, firm-, and/or use-specific. Plant and equipment that is designed for a particular firm and a particular purpose, perhaps integrated in a larger system of production, suffers a significant loss of market value when it is produced and again when it is installed. The assumption of substantial illiquidity of capital goods is a *sine qua non* of Keynesian investment theory.

Implications of the assumption set for neoclassical investment theory

The combined effect of these assumptions helps give neoclassical investment theory its defining characteristics. The assumption that owners and managers are identical agents settles the otherwise contentious problem of specifying a preference function for the firm itself. Most important, it eliminates the embarrassing possibility that ownership and management will have conflicting objectives and conflicting; attitudes toward risk. It thus sustains the neoclassical

---

[7] This reversibility property is not be altered by the assumption of gestation lags. With perfect resale markets, such lags have no effect on the speed or cost of disinvestment and a rational firm would take forward lags into account in its planning. Nor is it *qualitatively* affected by either moderate *or* relatively short-lived "costs of adjustment," Of course, if these costs were quite large, were attached to the *resale* of capital goods and remained quite large for many years or even decades after a decision to disinvest they would be equivalent to the assumption of irreversibility. But this is not the standard specification of adjustment cost models. The convex adjustment cost literature "generally ignores the effects of irreversibility" (Pindyck, 1991, p. 1138). Just as time has been said to be a device to keep everything from happening at once, adjustment costs are an analytical device designed to keep the optimal capital stock from happening at once and make investment a continuous function of its determining variables.

[8] The user cost or rental price is also affected by prospective capital gains or losses on the resale of investment goods, but this effect is generally considered to be of little theoretical or empirical significance.

[9] See the survey of the irreversible investment literature in Pindyck (1991).

Vision by helping to assure the optimal coordination and synchronization of the real and financial sectors.

In neoclassical financial theory, management concerns itself only with the expected value of the distributions of expected future returns on prospective investment projects, not with other moments. The discount rate it applies to these expected returns does reflect perceived risk, but it is risk as evaluated "from the [financial] investor's viewpoint" and not from its own (Brealey and Myers, 1988, p. 188). In typical neoclassical macroeconomic investment models, on the other hand, the firm is formally assumed to be risk-neutral. Risk enters the model through the cost of capital, a variable that is determined in financial markets and is thus exogenous to the firm. In either case, there is no role for an autonomous enterprise preference function.

In the absence of managerial autonomy, the suppliers of financial capital to the firm exercise sovereignty over the accumulation process. They do have utility functions, of course, and are, in general, risk-averse. It is their job to evaluate expected corporate cash flows with different risk characteristics, decide on optimal leverage ratios, diversify portfolios so as to maximize expected utility and achieve risk-return efficiency, and determine the cost of capital to the enterprise. The enterprise then passively implements the investment strategy its owners have chosen. A necessary condition for the validity of the neoclassical assertion that financial agents do their job optimally is the assumption that they have perfect knowledge of the stochastic future. The conflation of ownership and management and the neoclassical treatment of uncertainty thus help create the ethereal world of the Modigliani-Miller theorem and of Gordon's propositions (3) and (4). Neither dividend policy nor the degree of leverage of the firm has any effect on its investment decision, a proposition that "holds under reasonably general conditions" (Blanchard and Fischer, 1989, p. 295). There is no room for Minsky's "financial fragility" hypothesis here.

The assumption of liquid physical capital or reversible investment makes the central conclusions of neoclassical investment theory insensitive to the moderate relaxation of the other assumptions. With liquid capital, it would make little difference to the character of investment theory if the firm itself were risk-averse, because investment would not be very risky. And it would not matter much if the firm had less than complete information about future states of the economy, because with reversible investment and reversible debt, mistakes would be relatively costless.

Conversely, if capital were assumed to be substantially illiquid, the financial commitments associated with investment spending would be irreversible: mistakes would be costly and could be catastrophic. Under such conditions, the degree of managerial risk-aversion would matter. And, as the irreversible investment literature demonstrates, even the risk-neutral firm would be "highly sensitive to risk in various forms" (Pindyck, 1991, p. 1141). In an environment of Keynesian uncertainty, investment would be sensitive to changes in expectations and in the degree of confidence management placed in them. Instability in the expectations and confidence formation process would bring instability in investment spending in its wake.

In the next section I argue that the combined assumptions of illiquid capital, a semiautonomous firm, and Keynesian uncertainty are needed to construct an investment theory adequate to capture the essential characteristics of the world in which we actually live.

A Keynesian alternative

Gordon presents a formal model of what he calls the Keynesian theory of investment. We are less ambitious here, attempting only to sketch out the general characteristics of an investment theory based on the substitute core assumptions discussed in the previous sections.[10]

A realistic theory of investment should incorporate the assumption that the firm is a semiautonomous agent with a preference function of its own. We would expect the firm to pursue growth in size or market share and in profits -its *growth* objective - and avoid threats to its decision-making autonomy or its financial security - its *safety* objective. The existence of this safety objective makes the firm itself risk-averse.

Growth is attainable only through capital accumulation, but capital accumulation must be financed. Debt finance creates explicit, legally binding cash flow commitments to creditors. But even internal funding and stock flotation create implicit cash flow commitments to shareholders. If commitments to stockholders cannot be met out of the future operating profits generated by invested capital, management may experience a threat to its decision-making autonomy; if commitments to creditors are not met, the firm might go bankrupt. In a Keynesian world financial commitments, especially to creditors, are relatively certain while expected profits are not. With long-lived illiquid capital, the firm must form expectations of cash flows well into the future and must assess the quality of the expectations thus formed. But about such matters, "We simply do not know." When capital goods are illiquid the future is unknowable, serious mistakes are possible and the final commitments associated with them are irreversible. Thus, capital accumulation is simultaneously *necessary* and *dangerous* for the firm itself: it is necessary to achieve growth and defend its markets and its profits from aggressive competitors, and dangerous because disappointed expectations can make it difficult or even impossible for the firm to fulfill financial commitments.

Were firms to undertake only those investment projects with very high expected profit rates and low risk, they might be able to improve growth and safety prospects simultaneously. But as the firm considers projects with decreasing expected profits and increasing risk, the expected growth that increased investment promises will be associated with greater financial burdens and decreased safety. Conversely, if the firm maximized safety, it would forgo growth opportunities. Thus, the essence of management's decision-making dilemma is that, at the margin, it confronts a *growth-safety trade-off.* Firms must seek a level of investment that achieves a satisfactory balance between their growth and safety objectives.

In a Keynesian model, then, investment will be determined by management's preference for growth relative to safety and those variables that affect the perceived relation between investment and growth and between investment and safety. For example, the expected profit rate has a powerful influence on investment because a higher profit will, by increasing expected profits per unit of investment and by raising expected profit flows relative to cash flow commitments to owners and creditors, increase both growth and safety simultaneously. On the other hand, increased financial leverage, higher interest rates, or a decrease in management's confidence in its ability to foresee future economic conditions will depress investment because

---

[10] The discussion that follows abstracts from the effect of the firm's competitive environment and "strategic" considerations on the investment decision. See Crotty (1993) for an analysis of the effect of changes in the competitive environment on the enterprise investment decision. See Crotty and Goldstein (1992) for one attempt to construct a formal model of the enterprise investment decision along these lines.

they lower the safety associated with every prospective investment project. The enterprise investment decision at a fixed point in time can be briefly characterized as follows: *Ceteris paribus, a managerial preference for growth relative to safety, a high expected profit rate, financial robustness, low interest rates, and a minimal sense of uncertainty all stimulate investment, and vice versa.*[11] Specifying the determinants of investment at a point in time, however, is but the first step in the construction of a dynamic investment theory. There are two potential endogenous sources of change in a Keynesian model: (1) conventional expectations and confidence formation; and (2) the effect that the investment decision in the aggregate might have on the value of its real-sector determinants.

Keynes and Minsky have used the theory of conventional decision making to explain how and why financial market participants endogenously change their expectations and, therefore, their behavior over the course of a business cycle. But conventional decision-making must be applied to the enterprise as well. Here, as in financial markets, realized outcomes can change the investment decision whether or not they are consistent with managerial expectations of them. Unexpected outcomes will change forecast values and could induce an alteration in the forecasting procedure and/or a decline in management's confidence in the validity of the forecasting process. But even the confirmation of expectations by events will alter the level of investment because it will raise confidence in the meaningfulness of forecasts. For example, the longer the realized profit rate is rising (or at least not falling), the more confidence management will place in its forecast that the profit rate is unlikely to fall during the relevant future. And the longer the existing debt-equity or interest-coverage ratio has been maintained without triggering a threat to financial security, the more likely it becomes that a more confident management will revise upward its estimate of the maximum degree of leverage that it is safe to accept. To paraphrase Shackle, investment is an inherently restless variable.

When the firm is either pessimistic about the future or has no confidence in its ability to make meaningful predictions, it will consider the accumulation of even modest amounts of debt-financed capital to be unsafe and will see even normal debt-equity ratios as dangerous, so investment will be depressed. Conversely, when management is upbeat about the future and confident that its optimism is well founded, the growth objective will dominate and investment will accelerate. Boom euphoria will make even historically high debt-equity ratios seem unthreatening. Thus, safety is jointly constituted by objective variables such as recent profit rate trends and debt-equity ratios and by *subjective,* conventionally constituted variables such as maximum acceptable leverage, optimism (about future prospects), and confidence in the meaningfulness of expectations.

As Keynes, Minsky, and Marx emphasized, these subjective variables alone can create boom-bust cycles: the safety concerns that restrain the managerial firm's drive to invest ebb and flow in endogenous Keynes-Minsky-Marx cycles.[12] *Ceteris paribus,* so does investment spending. But as Minsky has stressed, these endogenous cycles have across-cycle ratchet effects.

---

[11] These results are formally derived in Crotty and Goldstein (1992). The relation between investment and confidence is in fact more complex than indicated in the text. While confidence in an optimistic forecast will raise investment, confidence in a pessimistic forecast will lower it.

[12] See Crotty (1985) for a discussion of the role of money, credit, uncertainty, and endogenous expectation and confidence formation in Marx's theory of accumulation and crisis.

Neither the high leverage of the boom nor the conservatism induced by crisis automatically evaporate at cycle's end. Rather, they continue to depress investment for an extended period.[13]

Of course, the determinants of safety are not the only endogenous sources of cyclical or secular instability. In Marxian real sector models and in some Keynesian-Kaleckian multiplier-accelerator models, an investment boom stimulated by a high rate of profit can initiate a chain of events that will eventually cause the profit rate to fall. In Marxian theory the rate of investment depends on the rate of profit, an endogenous variable whose value changes with changes in aggregate demand, cost-price relations, and technology. Movement in the determinants of the profit rate triggers change in the pace of investment that alters the state of the economy, and thus changes the rate of profit. In other words, investment is always responding to conditions that are altered by its response. As argued in Crotty (1990a), a theory of endogenous instability should have both real and financial sector roots.

An investment theory of this type has several noteworthy properties. First, though based on partly conflicting assumptions, it has much in common with Gordon's model: the firm itself is risk-averse; capital structures matter; the firm has an incentive to try to regulate its competitive environment - less intense competitive pressure raises the profit rate and makes the future more predictable; and, as formally demonstrated in Crotty and Goldstein (1992), a firm facing almost assured bankruptcy under existing conditions will "adopt a go-for-broke policy" (Gordon, 1992, p. 440).

Second, the theory is *institutionally specific and historically contingent,* as Keynes intended macrotheory to be.[14] The particular properties of a macromodel based on an investment theory of this sort would depend on the concrete specification of several functional relations and parameter values: management's degree of risk-aversion; the form and the stability of the expectations and confidence generating functions; the size and composition of the initial capital stock and the degree of enterprise leverage; the maximum level of indebtedness acceptable to management; and the impact of investment on the realized profit rate. Thus, the appropriate specification of the investment model and the dynamic properties of the macromodel would change with time and institutional circumstance.

Third, an investment theory of this kind would be more consistent with and reflective of the broad contours of the historical record than is the neoclassical investment model and could, therefore, help underpin a Keynesian alternative to the neoclassical Vision. As argued in Crotty (1991 b), a macromodel based on conventional decision making will be stable much of the time: it will typically be characterized by relatively smooth, continuous, and orderly dynamics. However, from time to time a Keynesian model will exhibit endogenously generated bouts of disorder and instability, of economic crisis and financial panic, whenever the conventions that sustain the expectations-formation process crumble. And this is precisely what we find in the empirical record: cyclical patterns of investment spending and corporate leverage, significantly different average net rates of capital accumulation and average degrees of financial fragility in distinct secular periods, and recurrent though irregular bouts of instability and financial crises.

---

[13] For example, capital accumulation in the 1990s may be severely burdened by financial burdens built up in the 1980s.

[14] Crotty (1990b) argues that the methodology used by Keynes to construct his macrotheory was institutionally specific and historically contingent.

REFERENCES

Blanchard, O., and Fischer, S. *Lectures on Macroeconomics.* Cambridge, MA: MIT Press, 1989.

Brealey, R., and Myers, S. *Principles of Corporate Finance.* New York: McGraw-Hill, 1988.

Crotty, J. "The Centrality of Money, Credit and Financial Intermediation in Marx's Crisis Theory." In *Rethinking Marxism,* S. Resnick and R. Wolff, eds. New York: Autonomedia, 1985.

_____ "Owner-Manager Conflict and Financial Theories of Investment Instability: A Critical Assessment of Keynes, Tobin and Minsky." *Journal of Post Keynesian Economics,* Summer 1990a, 12 (4), 519-542.

_____ "Keynes on the Stages of Development of the Capitalist Economy: The Institutional Foundation of Keynes's Methodology." *Journal of Economic Issues,* September 1990b, 761-780.

_____ "Rethinking Marxian Investment Theory: Keynes-Minsky Instability, Competitive Regime Shifts and Coerced Investment." *Review of Radical Political Economics,* March 1993, 25 (1): 1-26.

_____ "Are Keynesian Uncertainty and Macrotheory Incompatible? Conventional Decision Making, Institutional Structures, and Conditional Stability in Keynesian Macromodels." Working Paper 1991-17, University of Massachusetts, 1991b.

Crotty, J., and Goldstein, J. "Keynes-Minsky Instability and the Investment Decision of the Firm." Mimeo, University of Massachusetts, 1992.

Cyert, R., and Hendrick, C. "Theory of the Firm: Past, Present and Future; An Interpretation." *Journal of Economic Literature,* June 1972, 398-412.

Donaldson, G., and Lorsch, J. *Decision-Making at the Top: The Shaping of Strategic Direction.* New York: Basic Books, 1983.

Fama, F. "Agency Problems and the Theory of the Firm." *Journal of Political Economy,* April 1980, 288-307.

Fama, F., and Jensen, M. "Separation of Ownership and Control." *Journal of* Law *and Economics,* June 1983, 301-325.

Gordon, M.J. "The Neoclassical and a Post Keynesian Theory of Investment," *Journal of Post Keynesian Economics,* Summer 1992, 14 (4), 425-443. Chapter I of this volume.

Jensen, M., and Meckling, W. "Theory of the Firm: Managerial Behavior, Agency Costs and Ownership Structure." *Journal of Financial Economics,* October 1976, 305-360.

Keynes, J, *The General Theory of Employment. Interest and Money.* Cambridge: Cambridge University Press, 1972 [1936].

_____ "The General Theory of Employment." *Quarterly Journal of Economics,* February 1937, 209-223,

_____ *The Collected Writings of John Maynard Keynes. Volume /4. The General Theory and After: Part II.* London: Macmillan, 1973,

Lucas, R. *Studies in Business-Cycle Theory.* Cambridge. MA: MIT Press, 1981.

Marris, R., and Mueller, D. "The Corporation, Competition, and the Invisible Hand." *Journal of Economic Literature,* March 1980,32-63.

Minsky, H. *Can "It" Happen Again?* Armonk, NY: M.E. Sharpe, 1982.

Pindyck, R. "Irreversibility, Uncertainty, and Investment." *Journal of Economic Literature.* September 1991,1110-1148.

Stiglitz, J. "Credit Markets and Control of Capital." *Journal of Money, Credit, and Banking,* May 1985, 133-152.

Williamson, O. "The Modem Corporation: Origins, Evolution, Attributes." *Journal of Economic Literature,* December 1981, 1537-1568.