Rethinking Marxian Investment Theory: Keynes-Minsky Instability, Competitive Regime Shifts, and Coerced Investment

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The goal of this paper is to reformulate Marxian investment theory so that it can provide an organic explanation of key "stylized facts" describing capital accumulation in US goods-producing industries in the past fifteen years. This reformulation requires two innovations. The first is a demonstration that Keynesian-Minskian ideas about uncertainty and financial fragility follow logically from the core assumptions used by Marx to construct his theory of accumulation. The second is a clarification and, to some extent, a reconceptualization of the contradictory relation between competition and investment in the accumulation process.

My interest in demonstrating the centrality of Keynesian ideas to Marxian theory is long standing. My concern with the dialectical relation between competition and investment in Marxian theory was stimulated by numerous articles in the business press that described U.S. manufacturing firms' reaction to the dramatic increase in foreign competition in the early-mid 1980s. Among the "stylized facts" which characterize this period are: competitive intensity rose dramatically, profit rates plunged, growth in domestic and world markets stagnated, and real interest rates spiked. In response to this threat to their growth and survival, many corporations radically altered their competitive strategy. They viciously attacked their workers (wholesale firings and take-away contracts were common), closed older plants, drastically reduced capacity-expanding investment, lowered R&D budgets, and undertook major new labor-saving, cost-cutting investment projects that had to be debt financed because profits had collapsed.[1]

Some aspects of these shifts in strategy fit comfortably in traditional theory. Others, especially increased debt-financed, cost-cutting investment in the face of battered profits and rather severe financial fragility, do not. In neoclassical theories such as Tobin's theory "q" and in Minsky's theory of financial fragility, a lower profit rate and higher leverage are associated with less

investment, not more. However, the description of firms investing in response to severe competitive pressure reminded me of Marx's references in Capital to "coerced" investment and his explanation of how competitive pressure "compelled" firms to "Accumulate, Accumulate!".

Unfortunately, most formulations of Marx's theory of accumulation accept the proposition that a falling profit rate inevitably lowers investment. What was needed, it seemed to me, was a reformulation of Marx's theory of competition which could address the question of whether "Accumulate, Accumulate!" is indeed a universal imperative and, if not, to establish the conditions under which competitive pressure can simultaneously reduce the profit rate and raise cost-cutting investment.

The structure of the paper is as follows. Section I discusses Marx's treatment of investment in Volume I of Capital and delineates the assumptions used to generate his conditional "Accumulate, Accumulate!" conclusion. Section II evaluates the impact on investment theory of key assumptions introduced in Volumes II and III, explores the more complex relation between investment and profits developed there, and establishes the conditions under which "Accumulate, Accumulate!" will or will not characterize the theory.

Section III argues that the basic assumptions in Capital generate a Marxian version of the Keynes-Minsky financial fragility thesis. Section IV reformulates the role of competition in the accumulation process and develops the conditions under which competition can "coerce" firms into investing in the face of declining profits and increasing indebtedness. Section V then briefly examines the behavior of investment in the 1980s through the lens of the theory.[2]

I. Investment Theory in Volume I

While Part One of Volume I theorizes capitalism as a contradictory unity of circulation and production and discusses the crisis potential of the system as it arises from its circulatory properties, the rest of the volume analyses the laws of capitalist production on the conditional assumptions that: (1) financial markets do not exist; and (2) there are no realization problems. These assumptions give Volume I investment theory a tentative or conditional status. When Marx removes them in Volumes II and III, his investment theory undergoes qualitative change.

How does Marx conditionally banish realization problems? He argues that competitive pressure is so intense that firms are induced and often "coerced" into investing all the financial resources -- here profits -- available to them.[3] If, as Marx assumes, only capitalists save and if firms are forced by competition to invest all available savings, then aggregate demand problems cannot exist.

Some of Marx's most widely quoted phrases from Volume I refer to the impact of competition on investment:

> Accumulate, accumulate! That is Moses and the prophets! ... Therefore, save, save, i.e. reconvert the greatest possible proportion of surplus value or surplus production into capital. Accumulation for the sake of accumulation, production for the sake of production...(1977: 742).

The "compelling" power of competition and "coercive" influence on investment is definitively summarized in Chapter 24.

> the development of capitalist production makes it necessary to constantly increase the amount of capital laid out in a given industrial undertaking, and competition subordinates every individual capitalist to the immanent laws of capitalist production as external and

> coercive laws. It compels him to keep extending his capital , so as to preserve it, and he can only extend it by means of progressive accumulation (1977: 739, emphasis added).

Marx's theory of competition thus generates a stark and simple conditional investment theory in Volume I. Because of competitive pressure, investment is constrained only by access to finance. Since there are no financial markets, investment will identically equal profit (which equals saving) and the net rate of growth of the capital stock equals the rate of profit.[4] There is no independent investment decision for the firm to make.

Thus the key to understanding investment theory in Volume I is a delineation of the concrete behavioral assumptions used to derive the conditional "Accumulate, accumulate!" imperative. The most important assumptions refer to: (1) the goals of the firm; (2) the intensity and character of competition; (3) the relation between accumulation, competition and technical change; and (4) the illiquidity of capital goods. We address each in turn.

One core assumption is that the enterprise is run by an owner-manager whose wealth, power, and social status are inextricably tied up with the fortunes of the firm. The owner-manager's most pressing objective is to survive as a capitalist. If survival seems assured, the capitalist wants the firm to grow; this is the sole route to the wealth and status associated with being a 'big' capitalist. In other words, Marx puts control of the accumulation process in the hands of agents who can achieve their personal objectives only by seeing to it that the objectives of the firm itself are survival and growth. Marxian firms are, in this sense, predisposed to accumulate capital.

A second core assumption is that competitive pressure remains at a very intense level throughout Volume I. However, though competition is perpetually intense, it is associated with two distinct modes of accumulation -- capital widening and capital deepening.

Marx opens Chapter 25 of Volume I with a discussion of accumulation in which he initially assumes that the rate of exploitation is satisfactory. The mode of accumulation is capital widening: accumulation takes place without any significant change in the technical composition of capital. Here competition takes the form of an all-out race to expand capacity in the face of growing markets and a given production technology (including a given organizational structure of the labor process). In this mode of accumulation competition does not threaten the firm. In Marx's words, "everything goes well". Since investment is motivated by the prospect of faster growth and greater profits rather than survival, the term "coerced" is not well suited to describe it.

Capital widening, however, will eventually erode the reserve army. With less fear of "the sack", workers are in a position to raise the real wage and sabotage workplace discipline: there follows "a quantitative reduction in the amount of unpaid labour the worker has to supply" (1977: 769). Thus, rapid capital-widening accumulation erodes one of its conditions of existence.[5]

This deterioration in the rate of exploitation triggers a switch in competitive "strategy" to capital deepening. Firms now invest in plant and equipment that embodies labor-saving technical change. Technical change becomes a weapon used by capital to counter attack labor. Since firms have less profit to invest and since each unit of capital requires less labor, the reserve army will be reconstituted over time and the rate of exploitation will gradually rise.

Two points about the capital deepening mode of accumulation are especially relevant to the argument about the effect of competition on accumulation pursued in Section IV. First, it is an invest-or-die mode of accumulation because firms which fail to invest all profits in cost-cutting capital goods will find their profit and growth rates falling below those of their competitors. Eventually, these firms will fail.

Second, the character of the competitive relation among firms differs qualitatively between these modes. We confront a problem in the presentation of our argument here because the logic of exposition used by Marx in Capital precludes a detailed analysis in Volume I of different forms of competition and their differential effects on individual firms. Volume I abstracts as much as is practical from cost-profit differences among firms and from details of the process of competitive struggle: though competition is intense, all firms are implicitly assumed to receive their proportionate share of industry profit. Therefore, the effect of competition cannot be fully explored until the "many capitals" approach of Volume III.[6] Nevertheless, we choose to violate Marx's expository logic at this point because Chapter 25's two modes of accumulation and competition are inherently distinct analytically: cost-cutting technical change is a weapon that firms cannot resist using against each other. This difference can be seen most clearly by making use of one of Marx's Volume III insights -- his distinction between "fraternal" and "fratricidal" modes of competition.

The capital widening mode of accumulation of Volume I can be thought of as taking place in a fraternal and noncoercive competitive environment. Here:

> competition acts, as is always the case when the general rate of profit is settled, as a practical freemasonry [or brotherhood] of the capitalist class, so that they each share in the common booty in proportion to the size of the portion that each puts in. (1981: 361)

The capital deepening mode, however, reflects a fratricidal form of competition because it brings cost advantages to the leading accumulators and threatens the survival of the laggards. In Marx's words, competition:

> now becomes a question of strength and cunning, and competition now becomes a struggle of enemy brothers. The opposition between the interest of each individual capitalist and that

> of the capitalist class as a whole now comes into its own, in the same way as competition was previously the instrument through which the identity of the capitalists' interest was asserted. (1981: 363)

Finally, Marx makes the core assumption that physical capital is substantially illiquid and, therefore, investment is irreversible. If capital was perfectly liquid, the firm could not be "coerced" by the threat of competition and technical change because liquid or "jelly" capital cannot be substantially devalued by technical change. If falling profits and shrinking markets pushed the firm to the brink of bankruptcy, its assets could be sold without substantial loss and the proceeds used either to acquire financial assets or another firm. Yet Marx emphasizes over and over again that more technically advanced capital devalues or "slaughters" existing capital and "compels" its sale "at absurd prices" (1977: 603).

> As the magnitude of the value and the durability of the applied fixed capital develops with the development of the capitalist mode of production, the lifetime of industry and industrial capital lengthens ... on the one hand [but] is shortened on the other by the continuous revolution in the means of production, which likewise gains momentum with the development of the capitalist mode of production. This involves a change in the means of production and their constant replacement, on account of moral depreciation, long before they expire physically (Marx 1967: 185).

The assumption that technical change destroys rather than preserves the value of the preexisting stock of capital is a cornerstone of Marx's thesis that accumulation is a contradictory process.

It is thus the illiquidity of capital that condemns those defeated in the competitive struggle to a social and economic death penalty.[7] So it is the illiquidity of capital that links cost-cutting

competition with the power to coerce the firm into investing against its will. If competitors buy more cost-efficient plants, the firm will be confronted by falling output prices and constant unit costs -- a profit squeeze. If the firm is to "remain in the game", it must find a way to accumulate more efficient capital even though this accumulation process will constantly devalue the stock of old capital. The capital deepening mode of accumulation can produce a low or even a negative rate of profit once the loss of value on the preexisting capital stock is taken into account.

Under these conditions, investment is properly characterized as coercive. Individual firms must invest to survive, yet investment of this kind at this pace can lower the rate of profit on total capital. If the primary objective of the firm is survival, if physical capital is illiquid, and if competition is intense, then when technical change is a major competitive weapon, the enterprise is placed in a coercive "invest or die" situation in which maximum accumulation is an individually rational strategy. But since even fraternal competition is intense, both modes of accumulation generate maximum investment in Volume I: Accumulate, Accumulate!

II. Incorporating the Assumption Changes of Volumes II and III

In Volumes II and III Marx makes three innovations that provide the foundation for an independent behavioral investment equation. First, Marx introduces the concept of realization crises. Second, he theorizes financial markets. Third, he adds a dialectical dimension to the character of competition.

1. Realization Crises

In these Volumes Marx introduces the idea that investment can be depressed by the firm's inability to sell all output at full value. This makes the expected rate of capacity utilization and thus

the expected rate of profit extremely uncertain. Realization problems are problems of disproportionality between the distribution of income as determined by technology and class struggle in the sphere of production and the distribution of demand across markets as it is affected by the distribution of income. Marx's central thesis here is that because capitalism has no mechanism that can coordinate the competitive struggle for profit with the distributional requirements for smooth reproduction, uncertainty permeates the investment decision.[8]

2. Financial Markets

Marx's theory of financial markets also creates complications in the theory of investment. I briefly discuss four. First, in place of the owner-entrepreneur we now have enterprise managers and a complex set of financial capitalists (including stockholders, bondholders, bankers and bank depositors). This raises a central question for investment theory that did not exist in Volume I. Who controls the investment decision of the enterprise -- owners or managers? For Marx, management becomes the active agent in control of accumulation while the capitalist proper becomes a relatively passive recipient of dividends (though an active financial speculator).[9] Thus, Marx's Volume I idea that the firm seeks its own reproduction rather than the maximization of stockholders' wealth is preserved in the rest of Capital through his assumption of managerial as opposed to stockholder control.

Second, financial markets facilitate the centralization of capital. They therefore make competition more intense, more effective and more threatening, though they also facilitate collusion and corespective interfirm relations.

Third, Marx's financial markets are characterized by Keynesian uncertainty, speculation, instability and crisis. Marx argues that stock prices "can rise and fall quite independently of the

movement in the value of the actual capital to which they are titles" and that "profits and losses that result from fluctuations in the price of these ownership titles ... are by the nature of the case more and more the result of gambling..." (1981: 609). The unknowability of the future and the inherently speculative nature of financial contracts lead Marx to his Volume III discussion of financial panics and interest rates cycles. Note that uncertainty affects investment and production directly as well. As Marx put it:

> The more productive capital increases, the more it is compelled to produce for a market whose requirements it does not know, the more production precedes consumption, the more supply tries to force demand, and consequently crises increase in frequency and in intensity (1963: 216).

Fourth, Marx theorizes a dialectical relation between investment and the growth of financial markets. Credit accelerates accumulation both cyclically and secularly: it can help postpone realization problems and can facilitate the financing of large scale capital projects. But it also creates more restrictive conditions for crisis avoidance and increases the potential severity of the crisis. In particular, external finance accelerates the pace of technical change, but when technical change slaughters the value of debt-financed capital, the firm will be threatened with bankruptcy and lenders will face default.

Put differently, financial markets allow accumulation to proceed at greater speed in those periods when profit conditions look good. But they also create a condition that Marx calls "oversensitivity". "It is precisely the development of the credit and banking system which ... seeks to press all money capital into the service of production ... that makes the entire [economic] organism oversensitive" (1981: 619). Once firms become highly levered, even a small decline in the

profit rate can trigger a crisis, while the integration of financial and real sector crises will deepen the subsequent downturn.

3. Competition as a Dialectical Process

Marx developed a dialectical relation between competition, technical change and accumulation in Volume III: both the intensity and the mode of competition affect and are affected by the accumulation process. While his discussion of this issue is undeniably sketchy, it seems consistent in spirit with the following argument. Because the rapid pace of technical progress threatens the viability of the accumulation process, capitalists have an ever-increasing material incentive to attempt to control the character and pace of technical change through collusive action.

Thus, competition creates forces seeking to negate it. Through the development of partially corespective (or mutually respectful or cooperative) interfirm relations such as oligopolistic structures, trade associations, conglomerate enterprises, enterprise-bank groupings and so forth, capitalists attempt to plan the rate of obsolescence. While corespective relations do not necessarily diminish competitive intensity, they do change its form: firms will eliminate those weapons and practices most destructive of industry profitability.[10]

But corespective relations are themselves contradictory. They allow firms to reduce uncertainty and generate greater profits, but they also provide the protection from competitive pressure within which bloated corporate bureaucracies, opulent executive emoluments, and excessively risk-averse strategies can develop. And they can generate a wide gap between the most advanced technology on the drawing board and that embedded in the capital stock. Thus, the longer corespective relations are maintained, the greater the incentive for some firm to undermine them. Eventually the anarchy inherent in capitalist relations will erupt once again. Marx's dialectical

theory of competition suggests that fraternal and fratricidal competitive relations will supersede each other from time to time.

> In practical life we find not only competition, monopoly and the antagonism between them, but also the synthesis of the two, which is not a formula, but a movement. Monopoly produces competition, competition produces monopoly. Monopolists are made from competition; competitors become monopolists. ... and the more the mass of the proletarians grows as against the monopolists of one nation, the more desperate competition becomes between monopolists of different nations. The synthesis is of such a character that monopoly can only maintain itself by continually entering into the struggle of competition. (Marx 1963: 152, emphasis added)

4. Is "Accumulate, Accumulate!" Still Moses and the Prophets?

Marx's new assumptions raise one question about investment theory that he never confronts directly. Does competition still force the firm to invest to the limit of its financial constraint until the crisis?

Logic requires a negative answer. Maximum accumulation now requires the maximum use of external funds and, therefore, it burdens the firm with maximum interest and dividend obligations, at least in the short run. Maximum accumulation entails maximum short-term risk. A rational management will not, in general, invest all the funds potentially at its disposal.

Moreover, a profit shortfall can now be generated in: (1) the sphere of production, or (2) via aggregate demand deficiencies, or (3) by a semiautonomous crisis in financial markets that triggers a sharp rise in interest rates. Therefore both the probability and the unpredictability of crisis have been magnified dramatically while the firm's ability to survive a crisis will be weakened if it has

maximized the use of external funds. Under these conditions, even maximum competitive intensity cannot make maximum investment a globally rational strategy. And, as we have seen, competition will not always be uncontrolled. Thus, "Accumulate, accumulate!" is now too simplistic an investment strategy.

Instead, Marxian investment theory is confronted with a Keynesian problematic that flows logically from Marx's own assumption set. The firm must accumulate illiquid capital assets in an uncertain environment: the faster its rate of accumulation, the faster its potential growth and the greater its short term financial fragility. Thus the concept of a growth-safety tradeoff must move to the center of the theory. However, this does not mean we have to give up Marx's idea that competition can coerce firms into investing. Our challenge is to move beyond the letter of Marx's work and use his concepts and arguments to create an understanding of the investment decision-making process that integrates Marx's theory of competition and the concept of the growth-safety tradeoff.

III. Marx's Version of the Keynes-Minsky Theory of Investment Instability: The Growth-Safety Tradeoff Investment Model

Several core assumptions are required to provide a logical foundation for Marx's view of the investment process.[11] For Marx's theory of fratricidal competition and coerced investment to be sustainable, management must be concerned with the secure reproduction of the firm itself. We therefore assume that management seeks the growth and security of the firm itself (and, through these, its own status, security and income) rather than the maximization of the market value of the company's stock. The growth objective embodies the drive to accumulate, the security or safety

objective embodies the firm's determination to reproduce itself. Stockholder interests are not, as in neoclassical theory, an objective of the firm; rather, they represent a potential threat to management's control of the enterprise.[12] Management will face a crisis whenever the sum of required interest payments and principal repayments plus the minimum level of dividends demanded by stockholders cannot be paid out of operating profits. Therefore, it will restrict investment to avoid excess leverage and will consider bankruptcy (defined here as the death of the firm rather than a temporary legal tactic) to be the ultimate disaster.[13]

Marxian theory also requires the irreversibility of the investment process.[14] A firm with liquid physical capital is not threatened by the unknowability of the future. It faces neither sunk costs nor intertemporal profit tradeoffs. Most important, when investment is reversible, the accumulation of debt is reversible as well: if an investment decision turns sour, the firm can resell the capital (minus depreciation) and repay the debt.[15] With irreversible investment the "legacy of past [debt] contracts" (Minsky 1982: 63) threatens the survivability of the financially "fragile" firm and, in so doing, constrains its willingness to invest.

Finally, given the illiquidity of capital and a management that fears bankruptcy or the loss of autonomy, Marxian investment theory must take into account the character of expectations: today's investment decision will affect profits, managerial autonomy and firm safety over the life of the capital goods. With illiquid capital, a Marxian firm is stuck with both the capital and the debt it has accumulated: it must pay interest on this debt even if the profit rate collapses. Thus, the firm must assess the future as best it can and consider both the prospective gains and the prospective dangers associated with investment.

However, in the approach to expectations taken by Marx and Keynes, the information

required for investment decisions -- the future net revenue flows from all potential investment projects -- is in principal unknowable. As Keynes stated: "About these matters there is no scientific basis on which to form any calculable probability whatever. We simply do not know" (1937: 214). Yet Marxian theory requires that investment decisions be made even though the information needed to make them optimally is in principle unavailable. Wealth-holders and firms must make portfolio composition and capital investment decisions in order to reproduce themselves: they cannot avoid the Keynesian-Marxian uncertainty dilemma reflected in the growth-safety tradeoff.

The Growth-Safety Tradeoff Investment Model

These assumptions provide the foundation for the Keynesian-Minskian components of Marxian investment theory. Given Keynesian financial markets and the managerial firm's growth-safety objectives, it is the combination of the assumptions of illiquid capital and the unknowability of the future that profoundly affects the character of investment theory. If capital was perfectly liquid, it would make little difference if the future were unknowable because mistakes would be reversible. If capital is illiquid, but perfect foresight is assumed, illiquidity may not matter much. However, in Marxian theory when management overinvests it will be unable to costlessly shed the financial burden of its errors.

The core ideas of the growth-safety tradeoff investment model (presented in detail in Crotty and Goldstein 1989) can be expressed succinctly. Management seeks growth (best thought of as a composite variable positively influenced by firm size or market share and expected profits) and safety (a variable inversely related to the likelihood that management's autonomy and/or the firm's survival will be threatened by shareholders or creditors). Both growth and safety are functions of investment. Growth requires capital accumulation but investment spending must be financed.

Internal funding and stock floatation create implicit future cash-flow commitments to shareholders while debt funding creates explicit cash-flow commitments to creditors. If these commitments cannot be met out of the future operating profits generated by the invested capital, management's autonomy will be threatened. However, while financing commitments, especially to creditors, are relatively certain, expected profits are not: investment in illiquid capital is both necessary for growth and dangerous to management and the firm.

At the margin (as is formally demonstrated in Crotty and Goldstein 1989), higher growth is associated with decreased safety, and vice-versa: there is a growth-safety tradeoff. Firms will seek a level of investment that achieves an "optimal" balance between growth and safety. Therefore, investment will be affected by: (1) management's preference for growth versus safety and (2) those variables, objective and subjective, that affect the relation between expected growth and safety and the investment decision. For example, the expected profit rate has a powerful influence on investment because a higher profit rate will, by increasing profits per unit of investment (growth) and by raising expected profit flows relative to cash flow commitments to owners and creditors (safety), simultaneously raise both the growth and safety levels associated with every prospective level of investment. On the other hand, increased leverage and higher interest rates will depress investment because they make every level of investment more dangerous. Ceteris paribus, a managerial preference for growth relative to safety, a high profit rate, financial robustness, low interest rates and minimal uncertainty stimulate investment, and conversely.[16] Note in particular that, ceteris paribus, a rise in competitive pressure will decrease investment by lowering the profit rate and increasing uncertainty.

"Safety" is jointly constituted by objective variables such as profit rates and debt-equity or

interest coverage ratios and by subjective, conventionally-constituted variables such as optimism (about future prospects) and confidence in the meaningfulness of expectations.[17] When the firm is pessimistic about the future or has no confidence in its ability to make meaningful predictions, it will consider even the accumulation of modest amounts of externally financed illiquid capital to be unsafe and will see higher than normal debt-equity ratios as dangerous, so investment will be depressed. Conversely, when management is upbeat about the future, the growth imperative will dominate and investment will boom.

As Keynes, Minsky and Marx emphasized, these subjective variables follow endogenous boom-bust cycles.[18] As a result, the safety or survival concerns that restrain the managerial firm's drive to invest ebb and flow in Keynes-Minsky-Marx cycles. Ceteris paribus, so will investment spending. But these endogenous cycles have across-cycle ratchet effects. The high leverage of the boom will continue to depress investment for an extended period. Capital accumulation in the 1990s, for example, will be severely burdened by the financial fragility created in the 1980s.

Though most Marxian economists are familiar with Minsky's financial theory of investment instability, many do not realize that Marx developed his own financial fragility theory. Space considerations preclude an extended treatment here.[19] But it must be stressed that a Marxian financial oversensitivity theory, as reflected in the growth-safety tradeoff model, must be an integral component of a Marxian theory of investment. Optimistic expectations, confidence in the meaningfulness of forecasts, managerial stress on growth rather than safety, and a robust financial structure contribute to a rapid rate of accumulation, while financial fragility, pessimistic expectations, shattered confidence in the ability to forecast, and an obsession with safety will severely depress investment. And for Marx, the effect of these variables on accumulation is

conditioned by the mode and intensity of competition.

IV. Competition and Capital Accumulation in Marxian Theory

The appropriate Marxian "model" of enterprise decision making depends on the mode and intensity of competition. Two distinct competitive regimes are defined: a corespective regime characterized by fraternal competition and an anarchic regime characterized by uncontrolled, fratricidal competition. In a corespective regime the basic growth-safety model operates and the investment decision is not "coerced." Anarchic competition, on the other hand, severely limits firm choice: here the firm is coerced into adopting investment policies that would never be adopted in a corespective regime.[20]

1. The Role of Strategy in a Marxian Theory of Investment

Under Keynesian uncertainty the typical neoclassical thesis that a firm can choose an "optimal" investment trajectory to maximize a fixed objective function given "hard" estimates of all parameter values over the long term planning horizon makes no sense. A Marxian firm can only make "soft" projections of the future and distrusts detailed forecasts for periods beyond a few years. Its confidence that the recent past is an adequate guide to the future ebbs and flows with experience. It pursues imprecisely-defined goals of growth and safety; its attitude toward the tradeoff between the two shifts from time to time.[21] Since it cannot optimize, the firm must select a particular organizational structure and particular strategies (or hueristics or guidelines or rules-of-thumb) for gathering and processing information and for making important decisions.

A corporate strategy identifies and prioritizes goals and selects the structures and procedures used to pursue them. The strategy must provide guidance for decision making in finance, product

selection, pricing, marketing, R&D, labor relations and investment policy. Different strategies entail different policies and therefore generate different decisions in seemingly identical external circumstances. A change in strategy thus entails a qualitative shift in the investment function: a Marxian investment function should be strategy-contingent.

One important aspect of any strategy is its time horizon. A short term strategy requires that corporate outlays return a profit quickly. It will lead management to economize on R&D spending, on new product development, and investment projects with large upfront costs or slowly developing payoffs. Under a short term strategy a firm is likely to neglect its basic product markets when -- as in the 1980s -- there are temporarily more lucrative opportunities in financial markets. Finally, short term strategies militate against high wage, high skill, low turnover labor policies because the firm will be hesitant to absorb the high costs in wages, benefits and investments in on-the-job training associated with them.

Long term strategies push the payback period well into the future. Under a long term strategy a firm is likely to pass up "fast buck" opportunities in favor of R&D or investment projects that are crucial to future competitiveness. It will allow the firm to pursue a high wage, high skill, high morale labor policy if management believes that this is the best way to develop and implement advanced technology and change products and production methods quickly as unpredictable market conditions require.

Two points about time horizons are worth noting. First, admittedly casual empiricism suggests that long term strategies seem to be more efficient than short term strategies. They are the preferred strategies of the German and Japanese companies that dominate world trade and were the strategies used by U.S. companies in the decades of their predominance. Second, long term

strategies are risky in the short run because they require large commitments of funds well in advance of expected returns and pass up the temporary saving in unit labor costs that a low wage, authoritarian labor policy can achieve. Thus, if the short term survival of the firm is called into question by a collapse in the profit rate, management will be forced to adopt a short term strategy.

It must also be understood that corporations operate under powerful strategic inertia. Changing strategies and structures is a costly, disruptive, risky and threatening process. It may threaten the status of, and cause dissension among, members of the top management team and can cause declining morale and productivity among white and blue collar workers. In addition, general strategies are deeply imbedded in the corporation's "culture." Moreover, strategic change increases uncertainty. The results of untested strategies and decision-making structures is less predictable than the status quo. Management can never be sure how competitors will react to new strategies, or how workers will respond to changes in reward structures, work rules or in the degree and form of managerial control of the labor process.[22]

The existence of strategic inertia means that changes in corporate strategy will be infrequent. To induce management to undertake the tremendous cost and accept the enormous uncertainty involved in strategic change requires either a powerful positive incentive or a powerful threat. The incentive might be the likelihood that a strategy change could help an aggressive firm use its competitive advantage to steal a major share of its competitors' markets. Alternatively, the firm could be coerced into a strategy change by a serious threat to its survival created by a qualitative intensification of competitive pressure, one strong enough to convince management that under its current strategy it cannot achieve even minimally-acceptable levels of its growth and, especially, its safety objectives. The mode and intensity of competition, the potential for strategic change and the

appropriate model of the investment decision are intimately related.

2. Investment Theory in a Corespective Competitive Regime

Corespective competition is orderly and limited to those actions that do not threaten total industry profits. Accumulation within this regime might be thought of as capital widening, here broadly defined to exclude not technical change per se, but rather technical change which slaughters a substantial percentage of the value of the capital stock (and thereby threatens the financial health of the industry) or forces firms into costly and disruptive changes in labor relations policies.

In a corespective regime, firms will have high profits (compared to fratricidal competition) and reasonable protection from dysfunctional (as opposed to profit-augmenting) technical change. With competition held within well understood guidelines, uncertainty will be minimized. Thus, corespective relations permit the firm a wide range of choice of strategies and bureaucratic structures: this is not a coercive environment. In particular, the firm has the resources and the security needed to adopt an efficient long-term strategy.

In a corespective world, investment theory is adequately represented by an unrestricted growth-safety tradeoff model. Management will select an investment trajectory designed to produce high expected growth while preserving firm safety and managerial autonomy.

Thus, in a corespective regime Marxian investment theory will reflect the insights of Keynes and Minsky. What is distinctive about Marxian theory under these conditions is its dialectical theory of profit determination. A high profit rate stimulates investment because it raises expected growth and safety at every level of investment. But in Marxian theory an investment boom will at some point create a fall in the profit rate which, in turn, will reduce both the expected growth and the degree of safety associated with every prospective level of investment. As a result of this inevitable,

real-sector induced deterioration in the growth-safety tradeoff, investment will eventually collapse. For Marx, crises have real as well as financial roots.

More intense competition within a corespective regime will, by lowering expected profits and raising uncertainty, cause a deterioration in the growth-safety combinations available to the firm. Ceteris paribus, more intense competition means less investment.

However, should the intensity of competition reach a point where the firm cannot generate even minimally acceptable growth-safety results under its current structures and strategy, it will force a strategy change and thereby cause a shift in the investment function. Once anarchic competition erupts, the unconstrained growth-safety tradeoff model is no longer applicable.

3. Investment in an Anarchic Regime: Regime Shifts and Strategic Change

There are several reasons why the relative harmony of corespective relations might be shattered. Conditions external to the industry may deteriorate, causing a serious long-term decline in the profit rate that could trigger a bitter struggle for survival. For example, the large rise in the value of the U.S. dollar in the early 1980s permitted foreign firms to substantially lower their prices in U.S. markets: the degree of competition facing U.S. goods producers increased dramatically. Alternatively, bureaucratic sclerosis may set in, causing such inefficiency that a huge potential payoff awaits the first firm to seek industry dominance.

An outbreak of fratricidal competition will dramatically alter the firm's environment. With no collective industry structure to control them, the stronger firms will try to destroy the weaker firms and then, perhaps, each other. New capital-embodied technology may be adopted it even if it creates or reinforces a tendency toward uncontrolled technological competition and financial chaos in the industry. Fratricidal competition generates a capital deepening mode of accumulation in

which firms are likely to attack their workers as well as each other.

An outbreak of anarchic competition, therefore, will dramatically worsen the growth-safety tradeoff. Investment will have a lower expected return, while decreased cash flows will raise the level of financial insecurity for any given degree of leverage. Moreover, with competition uncontrolled, there will be a dramatic increase in uncertainty which may cause management to lower the degree of leverage it is willing to tolerate just as leverage is, in fact, rising. With lower profits, higher uncertainty, greater financial fragility, and increased managerial emphasis on safety, investment spending would collapse in a Keynes-Minsky model because the firm is permitted an unconstrained or uncoerced growth-safety "choice." When the growth-safety tradeoff is unattractive, the firm will choose to shrink or even go out of business.

A Marxian managerial firm, by way of contrast, cannot accept death or marginalization without a struggle even if this would maximize shareholders' wealth: the firm itself has an imperative to survive. When the eruption of fratricidal competition threatens decline or death under its current strategy, the Marxian firm will be forced to change it, no matter how risky this might be in the long run.

A strategic change may be required for either of two reasons. First, the firm's long term viability as a major player in the industry will be threatened by a low or no growth policy. Any firm whose size or efficiency (as measured, for example, by its market share) falls substantially below the dominant firms in the industry may be left without the financial clout, technological capability, or marketing power needed to withstand future attacks from larger competitors. If the unconstrained growth-safety tradeoff model leads to decisions which put the firm's long term viability in jeopardy, a strategic change must take place even though the firm's short term survival is not threatened.

Second, falling profits, rising financial fragility and uncertainty may put even the firm's short term survival in question. In this case, a Marxian firm would have no choice but to switch to a short term, survivalist strategy no matter how much this cost in terms of diminished efficiency and adaptability in the longer run. The 1980s seem to be a good example of this second case.

Thus, a change in the mode of competition from corespective to anarchic will coerce the firm into a strategy shift. And a change in strategy means a shift in the investment function: a coercive invest-or-die model replaces the "free choice" of the unconstrained growth-safety tradeoff.

4. Coerced Investment in an Anarchic Regime: Invest or Die Once Again

Since the qualitative increase in competitive pressure associated with the regime shift causes the destruction of the corespective model, we can no longer automatically assert that more competition means less investment. Of course, it may. The firm may judge that the environment is so bleak that marginalization or bankruptcy is inevitable; selling the enterprise as a whole or in pieces may be the best strategy available.

But then again it may not. Faced with the possibility of disaster under a status quo strategy, management may decide to seek reproduction by becoming more aggressive, by undertaking strategies and investment policies that it previously rejected as too disruptive and risky.

The strategic options available depend on industry conditions at the time of the regime shift. They all involve substantial investment spending that must be debt financed because profits are shrinking. If fratricidal competition breaks out when industry growth is expected to be satisfactory, the firm might keep its organizational and policy structure in tact while it replaces old capital with technically advanced new capital that can lower unit costs by generating more output from the same labor force working within the existing labor relations regime. This would constitute a change from

one long term strategy to another; long term strategies and anarchic competition are compatible in a growth environment. Of course, the new strategy would raise the firm's degree of financial fragility to levels previously thought of as unacceptably risky: only the expectation of strong industry growth could convince management to gamble on the possibility that it might grow its way out of this debt burden .[23]

However, if anarchic competition erupts in the context of a secular decline in the growth of industry demand, firms will be forced to switch to short term strategies. The firm is likely to seek self preservation by trying to shift the costs of the competitive struggle to its work force. Management may decide to fire significant numbers of workers and executives, to switch from a policy of labor peace to an attack on wages, working conditions, and unions.

More to the point, the firm may also undertake major new investment projects designed to lower costs of production through labor substitution and enhanced labor productivity, projects that must be debt financed because of low or even negative profits. The assault on labor and the increase in cost-cutting investment are complementary. Weak unions and frightened workers may be necessary preconditions for the implementation of labor-saving, job-reorganizing investment projects. Management may have to establish a new set of labor relations in order to create cost-reducing investment opportunities that did not exist under the capital-labor relations of the previous strategy. In accordance with Marx's theory of the reserve army, the conditions that give rise to this shift in strategy also raise the likelihood of its success. As many firms undertake labor-saving investment, unemployment will rise, workers will become less militant, and unions will weaken.

Thus, a rise in competitive intensity in an era of stagnant growth that triggers a switch in strategy can induce "coercive", capital-deepening investment spending. Faced, in the extreme case,

with an "invest or die" situation, some firms will invest aggressively. The composition of investment will shift dramatically: capital deepening investment will rise while capital widening investment, which responds positively to expected profits and market growth, will decline. The increase in coerced, cost-cutting investment may be greater than, equal to, or less than the decline in uncoerced, output-expanding, capital widening investment caused by the deterioration in the growth-safety tradeoff associated with heightened competitive struggle. Abstract analysis alone cannot tell us whether total investment will rise or fall. But it can tell us that neoclassical and Keynesian theories are blind to one of the most powerful influences on investment spending in an era of fratricidal competitive struggle. Since the neoclassical firm in particular was already optimizing, already cost-minimizing before the rise in competitive intensity, it has no other strategy to turn to.

5. Alternative Treatments of the Effects of Competition on Investment

The assumptions of a managerial firm, illiquid capital, Keynesian uncertainty and the concept of strategy change used to construct a Marxian theory of coerced investment create advantages over traditional interpretations of Marxian investment theory. One is simply that the logic connecting the assumptions to the conclusions is clearly articulated; we have at least outlined a theory of enterprise decision making. The investment decision of the enterprise in the traditional literature is often buried within a complex story about the rhythms of aggregate accumulation and crisis; it is left to the reader to extract it.

Many discussions of accumulation never consider changes in the mode of competition at all. In some, "Accumulate, Accumulate!" and labor-saving technical change are simply assumed to be never changing competitive imperatives. Conversely, there are theories of the effects of monopolization on the accumulation process, Baran and Sweezy's Monopoly Capital being the most

influential. However, in contrast to the dialectical treatment of competition taken here, Baran and Sweezy treat monopoly capitalism as the final stage in capitalist development.

Nevertheless, Baran and Sweezy do contrast investment practices in competitive and monopoly phases of capitalism. They conclude that while monopoly retards capital widening or output expanding investment:

> with regard to the cost discipline which it imposes on its members the monopoly capitalist economy is no less severe than its competitive predecessor, and that in addition it generates new and powerful impulses to [cost-cutting] innovations. (1966: 300)

A shift from corespective to anarchic competition, then, would generate an increase in capital widening investment and a decrease in capital deepening investment -- precisely the opposite of what actually happened in the 1980s.[24]

Marxian theories of the business cycle often discuss the effects of cyclical changes in the mode or intensity of competition on investment: Clarke (1990-91) and Itoh (1988) are two examples. Some ideas about the relation of investment and competition in these works are similar to ideas developed here. For example, Itoh links the change from fraternal to fratricidal competition as the economy enters the depression phase to a switch from capital widening to capital deepening investment. And Clarke links competition to overproduction to crisis to capital deepening, though the precise character of these links is not well articulated. In the crisis more intense competition "may" lead some capitalists to "seek to reduce their costs by introducing more advanced methods of production" (456).

Nonetheless, there are important differences between these cycle models and the arguments

in this paper. For one thing, they do not discuss the across-cycle dialectics of competition. For another, the treatment of uncertainty, expectations formation, financial "oversensitivity," and strategy selection is either underdeveloped or nonexistent. Most important, none of these alternative theories can provide an adequate answer to the following question about bursts of capital deepening investment such as took place in the 1980s. If profit-augmenting, cost-saving investment projects were available, why didn't firms undertake them before the increase in competitive pressure. Itoh and Clarke seem to imply that prior to the increase in competitive intensity firms were operating inefficiently or irrationally?

As I have developed the argument, the fact that a major shift in strategy can be triggered by a rise in competitive pressure does not imply that the firm was operating suboptimally or nonrationally before. Optimization in the strict sense is not possible. The previous strategy in the previous environment produced acceptable results. Disrupting organizational structure and routine, firing workers, slashing wages, closing (or slaughtering) nonamortized plants, attacking unions, taking on debt levels previously considered to be intolerably dangerous, and so forth are risky tactics. It is precisely because they are dangerous and unpredictable that the firm failed to undertake these tactics in the period when its results were satisfactory, when they were not forced to undertake them by the onset of fratricidal competition.

V. Investment in the 1980s: A Marxian Interpretation

The Marxian interpretation of the stylized facts about accumulation in the 1980s that I wish to present will, I hope, be obvious by now.[25] From the 1950s to the early 1970s corespective relations in core U.S. industries enabled firms to generate high profits, reduce uncertainty, maintain

financial robustness, control the character and pace of technical change, and adopt long-term strategies. The investment behavior of large industrial corporations in this period is best represented by the unconstrained growth-safety tradeoff model. However, by the mid 1970s U.S. manufacturing firms confronted sluggish domestic and global markets and a qualitative increase in foreign competition. And from 1980 through early 1985 the value of the dollar skyrocketed just as world markets sunk into stagnation. Anarchic competition erupted in the context of emaciated profits and stagnant demand to threaten the short term as well as the long term survival of major U.S. manufacturing firms.

Under these conditions domestic neoclassical or Keynesian firms would have stopped investing or even closed up shop. But, as the stylized facts demonstrate, many firms responded as Marxian theory suggested.[26] Because they did not have the profits or markets needed to switch to a different, more risky long term strategy, firms were forced to adopt strategies incorporating the following key short term, survivalist policies that are likely to be disastrous if maintained over the long run.

First, firms declared a one-sided class war on their workers -- in the plants, at the bargaining table, and in the realm of government policy. In the short run at least, labor has been soundly defeated.

Second, in this invest-or-die environment firms substantially increased expenditures on capital deepening, labor saving, cost cutting investment goods. Here is where Marx's theory of competition is uniquely helpful: a falling profit rate and shrinking markets triggered greater capital deepening investment. Coerced by the outbreak of fratricidal competition, corporations raised spending on those investment projects that made it possible to fire a large percentage of their

workers and frighten and bully the rest -- without raising capacity.[27]

Third, as capital deepening investment accelerated, capital widening, capacity expanding investment virtually disappeared.

Fourth, firms then reduced capacity and lowered average unit costs by closing older plants on a major scale. The pace of technical change had been wrenched from their control by the outbreak of anarchic competition. The combination of plant closings, the expansion of labor-replacing investment, and the wholesale firing of workers raised labor productivity and lowered wages even as the growth rate of the net stock of manufacturing capital declined.

Fifth, by investing in the face of battered profits (and, later, engaging in debt financed stock buybacks), managers pushed their firms into an unprecedented degree of financial fragility, something they never would have done if the shift to a regime of anarchic competition had not put the very survival of the firm in question (or if the surge in hostile takeovers had not threatened their autonomy). The spike in debt equity ratios and plunge in interest coverage ratios in the 1980s will strangle the accumulation process for many years to come.

Sixth, under intense financial pressure, many firms further demonstrated the short-term survivalist character of the new strategies by reducing R&D spending, placing their future competitiveness at risk.[28]

These developments are perfectly consistent with, and explicable by, the Marxian investment theory outlined in the previous sections. The Marx-inspired theoretical innovations introduced here break the automatic link in alternative theories of the firm connecting more intense competition to a lower profit rate (and a smaller value of Tobin's "q"), a smaller optimal capital stock, and lower investment. Most important, they provide an explanation of investment spending in the face of

collapsed profits and increased financial fragility that is invulnerable to the criticism that firms must have been operating "irrationally" because they neglected to make cost cutting investments prior to the outbreak of fratricidal competition.[29]

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ENDNOTES

1.I refer to these assertions as stylized facts because they are generally accepted in the literature. There is some debate over the effect of mergers per se on R&D spending. However, all that is

required for our purposes is an acceptance of Hall's conclusion that the "the link between leverage and reduced R&D spending has been established" (1990: 123). See also Hall 1991. The reader is referred to footnote 21 for a discussion of the process by which we establish the "fact" that cost-cutting investment increased while capacity-expanding investment declined in this era.

2.Two caveats should be mentioned. First, no attempt is made to integrate several key aspects of the changing economic environment in the past fifteen years (including the merger movement, the increasing globalization of production and finance, and the qualitative change in government economic policy) into the theory. Second, no attempt is made to translate the ideas discussed here into formal, quantitative models of accumulation. Marx's version of the Keynes-Minsky theory of investment instability is modelled in Crotty and Goldstein (1989), while a formal model of competitively-coerced investment is presented in Crotty and Goldstein (1992b). The reader should also be aware that my treatment of the relation between competition and technical change has been influenced by the insightful work of David Harvey (1982).

3.Our assumption of intense competitive pressure is compatible with the widely held view that Volume I abstracts from interindustry capital flows, concentrating exclusively on competition among firms in an industry. Footnote 6 discusses the character of competition in Volume I.

4.Nevertheless, Volume I does not generate a steady-state macroeconomic growth model: its macrodynamics are characterized by accumulation and instability. Clearly, this instability arises not from the simple investment function itself, but rather from a complex and dialectical determination of the profit rate that generates endogenous profit rate cycles. A high profit rate stimulates energetic accumulation which, in turn, erodes the rate of profit. That is, Marx's macrotheory of the

determination of the profit rate is an integral component of his theory of investment instability. Throughout this article I take Marx's dialectical and contradictory theory of profit determination as given and concentrate on the investment function itself.

5.Note that in Volume I Marx has created sources of investment instability that are independent of and theorized prior to any consideration of aggregate demand deficiencies or financial market turbulence. In contrast with Keynes, Minsky and various Post Keynesians, Marx has theorized real-sector impediments to smooth accumulation.

6.There is an ongoing and long standing debate in the Marxian literature concerning the role of competition in Volume I of Capital and the distinction between "capital in general" and "many capitals." See, for example, Burkett (1992) and Heinrich (1989) and the wealth of citations therein. Space considerations preclude any substantive comment on that debate here. My assumption that competition remains intense throughout Volume I is broadly consistent with much of this literature.

7.It may seem contradictory to argue that Marx assumes both that capital is illiquid and that technical change slaughters the value of capital in place, but this is not so. Once put in place, the market value of industry or firm-specific capital goods often falls well below their purchase price, so there is a limit on how much their market value can be further reduced by technical progress. However, the value of fixed capital to the active capitalist lies in its ability to help extract surplus value from living labor. Since technical change drives down average industry unit costs and, therefore, lowers the price of output, it will reduce the surplus value generated by capital in place and, in this manner, will substantially devalue it.

8.Harvey (1982) has an excellent treatment of the contradiction between the dynamics of production and those of circulation in Marx's theory of accumulation.

9.Indeed, Marx argues that with the development of the publicly-held corporation, the distinction between the stockholder and the bondholder (and between dividends and interest payments) becomes increasingly blurred. The growth of the joint-stock company involves the:

> transformation of the actual functioning capitalist into a mere manager, in charge of other people's capital, and of the capital owner into a mere owner, a mere money capitalist...[who] is now as completely separated from its function in the actual production process as this function, in the person of the manager, is from capital ownership (1981: 567).

10.See Clifton (1977) and Auerbach (1988) for a defense of the thesis that competition has become more intense and more effective with the development of the giant corporation of modern capitalism.

11.The relation between these assumptions and the investment decision is discussed in some detail in Crotty 1992.

12.The characterization of stockholders and managers as distinct economic agents as well as the changing relation between them in recent years is discussed at some length in Crotty (1990a). See also Donaldson and Lorsch (1983) for a widely cited study of the decision-making process in large industrial enterprises.

13.Note that by positing an enterprise that is "semiautonomous" from its stockholders, we open up the possibility of a non-synchronic or even contradictory dynamic interaction between the financial and real sectors of the model.

14.A modest mainstream literature dealing with irreversible investment has developed in the past

decade. See the survey of this literature in Pindyck (1991). Unfortunately these models are forced to rely on a large set of grossly unrealistic efficient market and rational expectations assumptions in order to make the extraordinarily complex problems they construct analytically tractable. For this reason, they provide no assistance in our attempt to construct a Marxian investment theory.

15.The standard neoclassical assumption of short-term "costs of adjustment" does not qualitatively alter this conclusion because investment and debt commitments become reversible after the short term . Of course, if adjustment costs were attached to the resale of capital, were very large, and remained large for many years and even decades after a decision to disinvest, they would be equivalent to the assumption of irreversibility. But such a formulation would be inconsistent with the purpose as well as the standard formulation of these models. The convex adjustment cost literature "generally ignores the effects of irreversibility" (Pindyck, 1991: 1138). Adjustment costs are an analytical devise to keep the optimal capital stock from being achieved instantaneously and thus prevent investment from being a discontinuous function of its determining variables. To appreciate the qualitative difference between irreversibility and adjustment costs, compare the standard neoclassical investment model with the irreversible investment models surveyed in Pindyck (1991).

16.The assumption of Keynesian uncertainty makes the investment decision-making process and the investment function itself institutionally contingent and historically specific. See Crotty (1990b) for an analysis of the institutionalist foundation of Keynes's methodology.

17.I have examined the relationship between Keynesian uncertainty, conventional decision making and macroeconomic stability in Crotty (1991).

18.See Minsky (1986) and Wolfson (1986) for discussions of the theory of financial fragility and of its applicability to the post WWII era.

19.I discussed financial aspects of Marx's theory of accumulation and crisis in detail in Crotty (1985) and contrasted it with Minsky's version in Crotty (1986).

20.Though we use the terms competitive intensity and competitive regime as if their definitions were clear and simple, the phenomena they describe are, in fact, complex and difficult to define precisely. Competitive intensity is implicitly treated here as a continuous scaler index, yet competition is obviously multidimensional. A competitive edge can be gained by lowering production or nonproduction costs, cutting profit margins, raising product quality or marketing effectiveness, gaining access to more or cheaper credit, or even getting better treatment from government officials.

We define a corespective regime as a situation in which there are significant, well-defined and universally respected limits on the dimensions and intensity of interfirm struggle that help sustain the industry profit rate. And we define an anarchic regime as a situation without such limits. Yet it is obvious that not all industries can be adequately characterized by this dichotomous partition.

We also assume that intensity can vary within a regime, that competition is more intense in an anarchic than in a corespective regime, and that there is a point at which a rise in intensity in a corespective regime will cause its demise.

21.There is an insightful critique of neoclassical optimization theory as a representation of enterprise decision making in Nelson and Winter (1982).

22.Clearly, the degree of risk depends on whether the new strategy is undertaken by a single firm alone or by most of the key firms in the industry.

23.This case is reminiscent of the late 1960s, a period in which federal spending on the Vietnam War sustained the growth of aggregate demand and investment in the face of deteriorating profits and increasing financial fragility.

24.The writings of Harry Magdoff and Paul Sweezy since the mid 1970s have emphasized the intensely competitive nature of financial markets, stressing their tendency to erupt in endogenously generated speculative booms. However, to my knowledge no attempt has been made to demonstrate the logical compatibility of this implicit specification of the decision making process used by financial firms with the cautious, do-not-spoil-the-market characterization of corporate managers in Monopoly Capital.

25.In Crotty and Goldstein (1992a) an investment function of the type discussed in the text is subjected to econometric tests using data for U.S. manufacturing in the post WW II period. These tests support the arguments presented in this paper. They show that manufacturing investment spending can be adequately explained by movements in the expected rate of profit, the degree of enterprise leverage and the mode and intensity of competition. They also demonstrate the existence of "coerced" investment: investment shows a significant positive response to an increase in the intensity of competition once profitability and leverage are taken into account. Finally, the tests suggest that capital deepening investment rose while capital widening investment fell in the early-mid 1980s, a conclusion consistent with business press descriptions of the era.

26.Bosworth observed that "a few analysts even link the rise in the value of the dollar to increased investment. Their argument, which departs from the conventional wisdom, ...is that a higher exchange rate presses American firms to invest to maintain a competitive position in world markets" (1989: 1).

27.Little provides analysis and measurement of the increase in investment and simultaneous decline in production jobs in U.S. manufacturing caused by the increase in foreign competition in the 1980s. "During the 1980s...U.S. manufacturers stepped up their adoption of technologically superior equipment and processes...that reduce errors, parts, production time -- and production jobs. ... [R]eal investment per manufacturing employee rose 40 percent between 1976-79 and 1984-86. Surely, the increased foreign competition permitted by the strong dollar provided much of the incentive for these investments..." (1989: 62, emphasis added).

28.See Hall (1990) for econometric evidence linking increased leverage to lower R&D spending and Hall (1991) for evidence that the debt burdens of the 1980s reduced investment as well as R&D.

29.I should point out that the thesis that a Marxian theory of competition is required to make sense of the simultaneous occurrence of a falling rate of profit, a steady or only modestly declining gross rate of capital accumulation, and a rising rate of corporate indebtedness is not original here. Robert Pollin (1986), for one, stated it quite clearly. What is original, I believe, is the theoretical foundation presented here in support of the thesis.