INVESTMENT, PROFIT AND CRISES: THEORIES AND EVIDENCE

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> Analyzing business cycles means neither more nor less than analyzing the economic process of the capitalist era…. Cycles are not, like tonsils, separable things that might be treated by themselves, but are, like the beat of the heart, of the essence of the organism that displays them.
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> —Joseph A. Schumpeter, *Business Cycles*, 1939

1. Introduction

American economists often talk about *the business cycle*, British authors generally favor *trade cycle*, and many in the profession dislike these terms and rather refer to *macroeconomic fluctuations*. Indeed, in the past two centuries, multiple terms have been used in the economic jargon to refer to this bipolar phenomenon: "boom-and-bust cycle," "expansion and contraction," "upturn and downturn," "mania and panic," "prosperity and depression." Terms such as "revulsion in trade," "commercial distress," "stagnation," "slump," "recession," or "crisis" were also used in the past to describe the phase of declining business activity of the "cycle."

Among authors who claim to be inspired to some extent by Marx's views, there are major disagreements about Marx's theory of crisis as well as on the nature and causes of the phenomenon.[1] The disagreements extend to how the Marxian concept of crisis is to be applied to twentieth-century periods of economic distress, and even to the terminology used to discuss these issues. Thus in the field of radical or heterodox economics, a common opinion is that the economic crises Marx discussed are entities

different from the recessions identified by mainstream economics. While the National Bureau of Economic Research (NBER) identifies recessions of the US economy starting in 1895, 1899, 1902, 1907, 1910, 1913, 1918, 1920, 1923, 1926, 1929, 1937, 1945, 1948, 1953, 1957, 1960, 1969, 1973, 1980, 1981, 1990, 2001, and 2007, most heterodox economists and radical authors who write on economic issues refer to just four crises of American capitalism since the late nineteenth century. These four crises would be the Long Depression at the end of the nineteenth century, the Great Depression of the 1930s, another crisis in the 1970s–1980s, and the Great Recession that started in 2008. This is the view of Foley (2012), Duménil and Lévy (2011, p. 22), Panitch (2013), Shaikh (2016, p. 726), and many others. Dissenting voices that I know of are Perlo (1973), McNally (2010), and Cámara (2013). For historians like Arrighi (2003, pp. 527–39) or Wallerstein (2001, p. 23; 2011) economic crises may last many decades, even more than a century.

If, as often sustained by left-wing authors, crises can last many years, or even many decades, while business-cycle recessions as defined by mainstream economics never last more than several quarters or a few years, then theories used to explain business cycles and crises must be different theories. However, in discussions of these issues it is hard to find this distinction in authors like Marx, Keynes, Kalecki, or Minsky, who largely inspire the ideas on crises of present-day heterodox economists.

In the years since the eruption of the global financial crisis in 2008, there has been an increased interest in crisis theory, business-cycle theory, or macroeconomic dynamics—whatever we may call it. In these matters, a major issue is whether there exists a key variable (or variables) that exerts a major influence on the economy and serves as the major determinant of its dynamic condition of expansion or contraction. This chapter reviews some aspects of crisis theories, focusing on endogenous theories and, particularly, on the role of investment and profits. The general assumption is that crisis theory and business-cycle theory are the same thing because in economic matters, terms such as downturn, crisis, recession, or depression refer to different intensities of the same intrinsic phenomenon of capitalism. I disagree with the view of crises as phenomena that may last many years. My starting notion is that an economic crisis is a brief interruption of the accumulation of capital, a momentary solution for solving conflicts created by the internal dynamics of the system, a "violent eruption that reestablish[es] the balance that has been disturbed" (Marx 1981a, p. 357; 1968, p. 497). My view is that the essential qualities that for Marx characterize "economic crises" can be found in what modern

economists call “recessions”; and what Marx called the “industrial crisis cycle” is precisely the same as “the business cycle,” as generally defined by Wesley Mitchell and the NBER.

I accept, with some exceptions, the NBER chronology, which for me is basically a chronology of economic crises. Thus, focusing on the past half century, I see economic crises in the mid-1970s, early 1980s, early 1990s, around the turn of the century, and in 2008–2009. This is consistent with the NBER chronology for the economy of the United States, with the exception that the two recessions that according to the NBER occurred in the first semester of 1980 and between mid-1981 and late 1982 constitute for me a unique crisis. A recent publication of the International Monetary Fund dates four recessions of the world economy in 1975, 1982, 1991, and 2009 (Kose and Terrones 2015). I indeed believe that there were crises of the world economy in these years, and that the US recessions were part of them, but I also identify a crisis of the world economy around the turn of the century, corresponding to the NBER recession of 2001. For more details on all this see Tapia (2014).

This chapter starts with an outline of the development of theories of the business cycle and then focuses on some endogenous theories and the role of profits and investment in these theories. Next I present empirical evidence to assess to what extent the theories, particularly those of Marx, Mitchell, Keynes, and Kalecki, fit or do not fit with empirical data. I conclude with some general considerations.

2. General Aspects of Crisis Theories

The earliest conjectures on the business cycle were probably the underconsumption theories proposed at the turn of the eighteenth century by Lord Lauderdale, Thomas Robert Malthus, and Simonde de Sismondi. These authors attributed downturns in business activity to economic circumstances, that is, to endogenous factors (Mitchell 1927, ch. 1). “General gluts” occurred because purchasing power available in society was not sufficient to buy the output produced. Wages, being too low, would not be sufficient for labor “to buy its own product.” These were therefore underconsumption theories in which insufficient purchasing power generates lack of consumption with unsold goods and depressed business.

David Ricardo, John Stuart Mill, and most economists of the nineteenth century—who agreed with Jean-Baptiste Say’s idea that sufficient demand is always available to purchase the produced supply—rejected these

theories. For Say the market represents an exchange of produced commodities, such that products exchange by products and, furthermore, as David Ricardo emphasized, nobody has any interest in hoarding money, which has no utility by itself. Therefore the production of commodities represents more purchasing power, and a general glut is impossible, though there may be an excess of a particular type of goods. This rationale, later baptized as Say's law, would be the supposed theoretical reason precluding the possibility of "general gluts," that is, crisis of overproduction.

For Gottfried Haberler, who in a major work reviewed the theories of the business cycle, underconsumption theories have a scientific standard significantly lower than other theories of the business cycle (Haberler 1960); and Joseph Schumpeter (1954, p. 740) suggested the same thing, asserting that underconsumption theory, "as Marx well knew, is beneath discussion since it involves neglect of the elementary fact that inadequacy … of the wage income to buy the whole product at cost-covering prices would not prevent hitchless production in response to the demand of non-wage earners either for 'luxury' goods or for investment." As we will see, Karl Marx had rejected Say's law, but his reasons for it were quite different from those of Malthus and Sismondi.

In the late decades of the nineteenth century, with the weapon of Say's law at hand, the nascent discipline of economics was quite aloof to the possibility of general gluts of markets and thus paid little attention to commercial crises and business-cycle issues. Indeed, apart from Marx and Jevons, economists were scarcely interested in this field (Morgan 1990, p. 15), and a major contribution such as *Des Crises commerciales et leur retour périodique en France, en Angleterre et aux États-Unis* came from a noneconomist, Clément Juglar, in 1862. For Juglar the crises were generated endogenously by the workings of the financial system propagating to commerce and industry. Economists paid little attention to it.

The years between 1870 and the start of the First World War saw major developments in economics. The "cycle" displaced "crises" in economists' language and minds, and crises theories were displaced by business-cycle theories (Besomi 2005; Schumpeter 1954, p. 1123). It was also the time when three exogenous theories that attribute business cycles to astronomical or biological influences were proposed. Thus in papers published by W. S. Jevons between 1875 and 1882 and in two books authored by H. L. Moore in 1914 and 1923, the fluctuations of the

economy were attributed to weather, determined in turn by astronomical phenomena—sun spots in Jevons's view, the planet Venus in Moore's (Morgan 1990, pp. 18–33). In the schemes of Jevons and Moore, the causal chain runs from astronomical events to weather, which in turn impacts agriculture and thus the economy at large. However, the data on these causal links were considered very insufficient by the contemporaries as evidence to prove these theories; years later Wesley Mitchell showed that neither agricultural output nor crop husbandry prices, inventories, or shipments correlate with business cycles (Mitchell 1913, p. 239; 1951, p. 58).

A third exogenous theory of the business cycle was that of the geographer Ellsworth Huntington, who in 1920 proposed autonomous changes in the rate of death as the factor stimulating or depressing business. An upturn in mortality rates due to causes unrelated to the economy would cause sadness and thus a drop in spending, which would lead to a slowdown of the economy; conversely, a decrease in mortality would cause increasing spending and prosperity. The views of Jevons, Moore, and Huntington, today scarcely considered or even known, are typical examples of exogenous business-cycle theories in which the oscillations between prosperity and depression are attributed to phenomena external to the economy itself.

In the late 1920s, exogenous theories of the business cycle found an unexpected source of inspiration coming from the USSR in the work of the statistician Evgeny Slutzky, who showed that applying some mathematical operations to a series of random numbers could generate apparent cycles. Following Slutzky's idea, Ragnar Frisch (1933) was the first in proposing that the fluctuations of the level of activity in modern industrial economies may be due to the effects of erratic, uncorrelated shocks upon an otherwise interrelated system. Frisch proposed the separation of what he called the impulse problem (the discontinuous random shocks providing "oscillating energy" to the system) and the propagation mechanism (the inner workings of the system, balancing it back toward equilibrium). In the 1950s Irma Adelman and Frank L. Adelman showed that applying perturbations to the endogenous variables of the propagation mechanism as well as applying random shocks to "energize" the system enabled an econometric model of the US economy to show oscillations resembling the empirically observed business cycles. According to Irma Adelman (1960), she and her husband had not "proved that business cycles are stochastic in origin," though they had presented evidence creating "a strong presumption in favor of this hypothesis," which would be "especially significant in view of the absence

(to date) of a completely satisfactory endogenous theory of business cycles."

To understand why Irma Adelman referred in 1960 to the absence "of a completely satisfactory endogenous theory of business cycles," it has to be mentioned that previous years had seen two major reactions of mainstream economics against endogenous theories of the business cycle. The first reaction was against Jan Tinbergen, the second against Wesley Mitchell.

Tinbergen went into research on economic issues from a background in mathematics and physics; he had not had formal instruction in economics. Thus in his research he was mostly an empiricist—he applied statistical methods to look for regularities in economic data that allowed him to infer economic laws. During the turbulent 1930s, he was charged by the League of Nations with investigating the cause of economic recessions. In his econometric studies on the business cycle, Tinbergen (1939) showed that investment is the key variable that oscillates upward in expansions and downward in depressions, a fact that was largely consistent with the view that John Maynard Keynes had recently exposed in his *General Theory of Employment, Interest and Money* (1936). The other key finding of Tinbergen was that profits have a major influence in endogenously determining investment, something that was at odds with Keynes's views.

In an episode that highlights the antiempirical proneness of economics, Tinbergen's pioneering investigation received heavy criticism from none other than Keynes and the nascent figure of the anti-Keynesian field, Milton Friedman (Friedman 1940, pp. 657–60; Keynes 1939, pp. 558–68). In brief, both Keynes and Friedman trashed Tinbergen's work.

The second attack against endogenous views of the business cycle took the shape of the "measurement without theory" debate. This debate started when Tjalling Koopmans reviewed the book *Measuring Business Cycles*, authored by Arthur Burns and Wesley Mitchell (Koopmans 1947, pp. 161–72).

Wesley Mitchell had published his views on the business cycle already in 1913, when he had conceptualized the cycle essentially as a fluctuation of the production of capital goods, that is, investment, which in turn followed the fluctuation of profits. His views had coexisted in mainstream economics with a variety of ill-defined ideas about the business cycle. Four decades later Mitchell was still convinced that business cycles are endogenously determined—as shown by the fact that in 1941 he republished, almost without changes and with the title *Business Cycles and Their Causes*, the theoretical part of his 1913 book. Furthermore, in 1944

he published an article in the *New York Times* in which he stated that no nation had yet found a solution to the problem of operating a system of free enterprise "without falling every few years into a spam of unemployment." (Mitchell 1944). For that problem, Mitchell said, "no nation has yet found a solution that does not involve the suppression of free enterprise itself." This kind of consideration was at odds with the claims of the Keynesian school, which, following the ideas of *The General Theory*, would soon be asserting that the business cycle could be put completely under control. Thus Paul Samuelson claimed in 1955 that by using proper fiscal and monetary policies, "our economy can have full employment and whatever rate of capital formation it wants" (cited by Bowles and Edwards 1985, p. 355).

In his review of *Measuring Business Cycles*, Tjalling Koopmans criticized Burns and Mitchell as just presenting "measurement without theory." From Keynesian quarters, Alvin Hansen (1949) echoed Koopmans, asserting that "the driving forces back of the cycle movement, Mitchell was never able to disclose," and similar views were exposed from the non-Keynesian field by Robert A. Gordon (1961). From the 1950s it was a common view in economics that Mitchell was just an empiricist who had described some interesting patterns, never going beyond the surface of economic phenomena. As a Marxist economist put it much later, Mitchell described the "ups and downs [of the economy] using little theory" (Devine 1986).

A more detailed explanation of the reaction of mainstream economics against Tinbergen and Mitchell goes beyond the scope of this chapter. It is sufficient to say here that it occurred in a context in which the economic profession was increasingly adamant in denying precisely what Wesley Mitchell asserted: that periods of prosperity and depression are endogenous and unavoidable, and that profits are a key variable in the cycle—something that was also supported by Tinbergen's econometric analyses. Keynesians and anti-Keynesians disagreed on many issues, but they agreed that business cycles could be eliminated—whether by the proper policies of Keynes, or the laissez-faire "non-policies" of Friedman. In that context, Tinbergen's and Mitchell's ideas were a hindrance to be removed, and they were marginalized and forgotten. At the same time, the view that business cycles are exogenously determined by random shocks became increasingly influential in economics in the 1960s and 1970s. Disputes between Keynesian and monetarist authors during the period of decline of Keynesian economics can be seen as arguments about which parts of the propagation mechanism proposed by Ragnar Frisch and the

Adelmans were the most important for the dynamics of the economy, but the idea that business cycles are exogenously determined was almost never disputed. Business-cycle theories based on monetarism and rational expectations were fully exogenous, and New Keynesians increasingly adopted the view that recessions may be caused by factors that are exogenous, though mediated by different kinds of market failure, rather than by the animal spirits that Keynes had proposed.

After the decades that Paul Krugman called the dark age of macroeconomics, the field was populated by an amazing variety of views, and ignorance, on business cycles. An important school was that of the real-business-cycle (RBC) theory, in which business cycles are conceptualized as the consequence of a self-equilibrating economy responding to random events. Supporters of the RBC theory often mention, in the tradition of Schumpeter and Hayek, technological innovations or "shocks" as causes of economic fluctuations. Other exogenous factors such as demographic changes, political influences, or variations in relative prices have also been proposed. This type of "shock" is often referred to without specifying its nature, though James Hamilton (1988; 2011), for instance, has repeatedly proposed oil prices as a key determinant of recessions.[2]

An important aspect of present views on the business cycle is that they are often vaguely defined, which makes it difficult to differentiate theoretical perspectives. Economists who support a theory of business cycles determined by exogenous factors—Austrians, monetarists, and RBC theorists—coexist with economists who view the fluctuations of the market economy as perhaps determined by endogenous factors—Samuelsonians, Keynesians, New Keynesians, post-Keynesians, institutionalists, and socialist economists.[3] However, as will be promptly explained, many economists, perhaps a majority, do not espouse any particular theory of the business cycle. Educated in the kingdom of Say's law, in which crises do not exist, they are clueless about possible explanations of black swans.

It is known that the economic profession did very poorly in predicting the global crisis that was later baptized as the Great Recession and was totally unexpected for almost all macroeconomists. As Nicholas Mankiw (2010, B6) put it, in 2008 the Great Recession "caught most economists flat-footed." This led many noneconomists to inquire (as the Queen of England did) what was the usefulness of a profession that supposedly deals with economic issues but had been utterly unable to forecast a major

economic disturbance such as the crisis that erupted in 2008.[4] Obviously, the presence or absence of "talent" to forecast economic distress is not connected with the presence or absence of psychic powers, but with the ability of economic theories to explain business cycles—and this is not very large, to put it mildly. This is demonstrated by the fact that in recent years distinguished economists have declared that the cause of recessions is not known and that recessions cannot be forecasted. For a famous econometrician, Edward Leamer (2010, pp. 31–46), economists' understanding "of causal effects in macroeconomics is virtually nil, and will remain so," and the Nobelist Eugene Fama declared that economists do not know what causes recessions (Cassidy 2010, p. 28). Nicholas Mankiw, who has had major roles as economic advisor of the US government, believes that it is basically impossible to predict recessions because economic fluctuations do not follow any predictable pattern (Mankiw 2009), such that future recessions will occur "at some unknown date for some unknown reason" (Mankiw 2010).

Though many economists would agree with these views, many others would disagree, as they sometimes vehemently argued about why crises occur, or more generally, about the causes of the business cycle. For many in the profession, the fluctuations of the economy—even when they are brutal—are to be seen in the framework of a built-in ability of the free enterprise system to balance itself, so that the swings of the economy between prosperous business conditions and ruinous downturns would be just the manifestation of the reaction of the economy to exogenous "shocks." What is the nature of these shocks? Many economists are happy leaving them undefined, but others, following the tradition of Friedman and Hayek, mention injudicious actions of governments or central bankers (Schwartz 2010; Butler 2010), or spikes in oil prices due to a variety of factors—wars, revolutions, or cartel activities (Hamilton 1988; 2009). Still others mention more abstruse causes, for instance idiosyncratic events impacting big firms and propagating through networks (Gabaix 2011; Acemoglu et al. 2012), or just miscellaneous circumstances that generate economic uncertainty (Bloom 2014). The alternative vision that economic crises have endogenous causes, so that business cycles are determined by the inner workings of the market system, is today hard to find in economics. This view is typical of two authors who largely theorized on economic crises, Marx and Mitchell, but because the ideas of these two authors are mostly ignored in modern economics, the view that business cycles are endogenous is today usually associated—in a quite improper way, as I will explain—with the left-wing components of the Keynesian

school, represented for instance by Kalecki (1954), Robinson (1979), Minsky (2008), and the modern followers of post-Keynesian economics. However, the distinction between endogenous and exogenous theories of the business cycle is important because, as Thomas E. Hall put it very well, "they imply a very different behavior for an economy," so that authors supporting exogenous factors as causes of the business cycle tend "to view economies as being inherently stable but shocked by outside forces," while endogenous theorists "generally consider economies as being inherently unstable and subject to self-generating cycles" (Hall 1990, p. 10).

For quite a number of economists and economic commentators, wages are a key variable explaining recessions. Indeed, since wages constitute the largest portion of consumption, and consumption is the largest item in the national product, wages are often thought of as important determinants of the business cycle. Therefore the idea of too-low wages leading to insufficient consumption, which in turn would depress the economy, appears plausible and is common in explanations of economic crises. It is the traditional underconsumptionist view. But other authors who also claim an important role of wages in explaining the business cycle propose exactly the opposite mechanism, too-high wages, as the factor leading to recession. This was the view once maintained by Arthur Pigou (1927) that has been recently upheld by Lee Ohanian (2008), a qualified representative of the RBC school. In this theoretical framework, high wages—caused by an exogenous factor, namely the distorting influence of trade unions on the equilibrium of the labor market—cause unaffordable costs for business, which in turn will stifle production with the consequent economic decay. Thus, in this scheme a decrease in wages would increase business activity and would have a stimulating effect on the economy.

A relatively similar perspective is offered by those who support the so-called "profit-squeeze" hypothesis (Boddy and Crotty 1975; Boldrin and Horvath 1995; Bhaduri and Marglin 1990) in which high wages lead to recession through the demand side. The causal pathway here would be from high wages to low profits, and from low profits to falling investment and the lack of effective demand with unsold goods that characterizes recessions. Some authors who support the profit-squeeze hypothesis also seem to hold underconsumptionist views, since they de-emphasize the role of investment in business cycles by claiming that, with a "relatively weak response of investment to profitability … consumption necessarily assumes the dominant role in effective demand" (Bhaduri and Marglin 1990). In a purely underconsumptionist view, too-low wages generating

too-low purchasing power for consumer goods reduce aggregate demand and cause recession, so that an increase in wages during a slump would tend to stimulate recovery. Indeed, this was Michal Kalecki's (1984) view that was later taken up by many radical authors, for instance by David Harvey (2010). Kalecki's views will be examined in more detail in the context of a review of theories in which investment is the leading variable of the business cycle.

3. Investment Leading the Cycle: Kalecki and Keynes

It is a common view today that Michał Kalecki independently discovered many elements of what later would be called Keynesian theory. Many would even agree that Kalecki's construct is superior to that of Keynes in crucial aspects. At any rate, as we will see, for both Keynes and Kalecki, and for the whole Keynesian school, investment is the key variable explaining macroeconomic dynamics, and thus leads the cycle.

In the early years of the Great Depression, Kalecki published several articles in *Przegląd Socjalistyczny*, an independent Polish "socialist review." Kalecki had no academic degree, since he had never finished his engineering studies. He had been earning his living as an economic journalist and working as an analyst for the Polish Institute for the Study of Business Cycles and Prices (ISBCP). This probably explains why he published in the socialist review under a pseudonym. Signing as Henryk Braun, Kalecki (1990, pp. 37–53) commented in the early 1930s on different aspects of the world depression. In one of the articles, he referred to Keynes as "a representative of British imperialism" and "possibly the leading bourgeois economist" (Kalecki 1990, 45–47). In "Is a 'capitalist' overcoming of the crisis possible?" (1932), Kalecki argued that during a crisis, investment shrinks and that

> it is precisely here that one should seek the starting-point of processes that will bring an upswing of the business cycle. Owing to the fact that during a crisis investment activity is at a lower level than that required for simple reproduction (maintenance) of the existing capital equipment, thus equipment is also gradually depleted. Unused and outdated machines are sold for scrap and new ones are not purchased to replace them. Besides, a considerable number of machines – and equipment in general – still kept in factories has not been reconditioned nor maintained properly, and may have become obsolete as well (due to

> technological progress), and is therefore only partially usable. On the other hand, since in a certain phase of the crisis the output of consumer goods generally starts declining more slowly than the rate of this contraction of capital equipment, there is a real need to employ the existing equipment more fully, which in turn requires investment. There is then a better chance of intensifying investment activity, which is the basic foundation for overcoming the crisis…. In the final analysis … of those components of the mechanism of the capitalist economy which could form a foundation for overcoming the crisis, the contraction of capital equipment caused by the decline of investments (and also by the running down of stocks) should be put in first place…. Finally, we should mention yet another possibility, namely a certain form of inflation consisting of individual states, or groups of states, starting up major public-investment schemes, such as construction of canals or roads, and financing them with government loans floated on the financial market, or with special government credits drawn on their banks of issue. This kind of operation could temporarily increase employment, though on the other hand it would retard automatic, "natural" adjustment processes which might lead to overcoming the crisis. (Kalecki 1990, pp. 51–53)

This quotation shows that Kalecki had already developed a highly elaborated theory of the business cycle in 1932. Kalecki's theoretical scheme was further developed in a booklet titled *Próba teorii koniunktury* (Essay on the theory of the economic conjuncture), that was published by the ISBCP in 1933, when Kalecki also presented his views on the business cycle in the Econometric Society. In 1935 abbreviated translations of his booklet were published in *Econometrica* and *Revue d'économie politique*. In 1936 Kalecki was planning to write a general exposition of his macroeconomic ideas in a book, until he read Keynes's *General Theory*. It was the book Kalecki was planning to write, and he felt deeply disappointed by having been beaten to it by Keynes (Shackle 1967, p. 127).

In contrast to the humble economic origins of Kalecki, who was almost completely unknown in the 1930s in his native Poland and abroad, Keynes was, at the time he published *The General Theory*, a prestigious economist. He was the editor of the *Economic Journal* and had occupied important positions in the administration of the British government. In his *General Theory* Keynes considered the business cycle "as being

occasioned by a cyclical change in the marginal efficiency of capital, though complicated, and often aggravated by associated changes in the other significant short-period variables of the economic system" (Keynes 1936, p. 313). For Keynes the marginal efficiency of capital is the expected rate of return of capital. In terms of nineteenth-century political economy, it is the expected rate of profit, and for Keynes it depends "not only on the existing abundance or scarcity of capital-goods and the current cost of production of capital-goods, but also on current expectations as to the future yield of capital-goods" (Keynes 1936, p. 315).

Considering the view that the crisis—"the substitution of a downward for an upward movement tendency that often takes place suddenly and violently"—may be due to too-high levels of the rate of interest, Keynes claimed that "a more typical, and often the predominant, explanation of the crisis is, not primarily a rise in the rate of interest, but a sudden collapse in the marginal efficiency of capital." But why would the marginal efficiency of capital—the expected profitability—fall suddenly after it had been steadily rising or at least remaining stable during the boom? What Keynes thought is that as long as the boom "was continuing, much of the new investment showed a not unsatisfactory current yield. The disillusion comes because doubts suddenly arise concerning the reliability of the prospective yield, perhaps because the current yield shows signs of falling off…. Once doubt begins it spreads rapidly" (p. 317).

Keynes suggests that the fall in expectations about profitability may be perhaps caused by the declining current yield. He does not seem to put much faith in that explanation, however, because during the crisis

> it is not so easy to revive the marginal efficiency of capital, *determined, as it is, by the uncontrollable and disobedient psychology of the business world*. It is the return of confidence, to speak in ordinary language, which is so insusceptible to control in an economy of individualistic capitalism. This is the aspect of the slump which bankers and businessmen have been right in emphasising, and which the economists who have put their faith in a "purely monetary" remedy have underestimated. (p. 317, emphasis added)

From the dependence of the trade cycle on the psychology of investors, Keynes concluded that in conditions "of laissez-faire the avoidance of wide fluctuations in employment may, therefore, prove impossible without

a far-reaching change in the psychology of investment markets such as there is no reason to expect" (p. 320).

One year after the publication of *The General Theory*, Keynes clarified in the *Quarterly Journal of Economics* some of the issues that had been raised by the book. For Keynes his theory could be summed up "by saying that, given the psychology of the public, *the level of output and employment as a whole depends on the amount of investment"* (emphasis added). Keynes was explaining his theory this way, focusing on investment, "not because this is the only factor on which aggregate output depends, but because it is usual in a complex system to regard as the *causa causans* that factor which is most prone to sudden and wide fluctuation" (Keynes 1937).

Kalecki reviewed *The General Theory* in the Polish journal *Ekonomista* in 1936, praising it as "a turning point in the history of economics." The book had, in Kalecki's view, two main components: one discussing the mechanisms determining a short-period equilibrium once the level of investment was given, and the other dealing with the determination of the level of investment. Keynes, Kalecki said, had reasonably succeeded in the former, but had failed in the latter. Kalecki agreed that "investment is the factor which decides the short-period equilibrium, and hence, at a certain moment, the size of employment and of social income. In fact the volume of investment will decide the amount of the labor force which will be absorbed by the existing production apparatus" (Kalecki 1990, p. 228).

Kalecki saw serious deficiencies in Keynes's belief that the level of investment would be determined by the equalization of expected profitability and the rate of interest. This would not lead to equilibrium, but to a continuous process in which higher investment led to a never-ending process of higher expected profitability, which in turn raises investment:

> Keynes's concept … meets a serious difficulty along this path also. In fact, the growth of investment in no way results in a process leading the system toward equilibrium. Thus it is difficult to consider Keynes's solution of the investment problem to be satisfactory. The reason for this failure lies in an approach which is basically static to a matter which is by its nature dynamic. Keynes takes as given the state of the expectations of returns, and from this he derives a certain definite level of investment, overlooking the effects that investment will in turn have on expectations. It is here that one can glimpse the road one must

> follow in order to build a realistic theory of investment. Its starting point should be the solution of the problem of investment decisions, of *ex ante* investment. Let us suppose there to be, at a given moment, a certain state of expectations as to future incomes, a given price level of investment goods, and, finally, a given rate of interest. How great then will be the investment that entrepreneurs intend to undertake in a unit of time? Let us suppose that this problem has been solved (despite the fact that it seems impossible to do this without introducing some special assumptions on the psychology of entrepreneurs or on money market imperfections). A further development of the theory of investment could be as follows. The investment decisions corresponding to the initial state will not generally be equal to the actual volume of investment. Therefore, in the next period the volume of investment will generally be different and the short-period equilibrium will change together with it. Hence we should now deal with a state of expectations that in general will be different from that of the initial period, different prices of investment goods, and a different rate of interest. From these a new level of investment decisions will result – and so on…. Keynes did not explain precisely what causes changes in investment, but, on the other hand, he has fully examined the close link between these changes and global employment, production, and income movements. (Kalecki 1990, pp. 230–32)

Keynes likely never knew about this review, which was only translated into English in the 1980s. But in the late 1930s Kalecki went to England and forged an awkward intellectual relationship with Keynes, eventually gaining his respect.

> According to Steindl (1991, p. 597), Kalecki published three versions of his theory of the business cycle, corresponding roughly to his 1933 booklet, his 1954 *Theory of Economic Dynamics*, and his late works. Though the relation between profitability and investment is explained in slightly different terms in each version of the theory, it remained substantially unchanged in its main aspects. In his 1933 booklet, Kalecki presented profitability as the variable "that stimulates the desire to invest. This is entirely consistent with reality, since the incentive to invest is expected profitability, which is estimated on the basis of the

> profitability of existing plants" (Kalecki 1990, p. 68). However, investment or consumption of some capitalists creates profit for others and, as a class, capitalists "gain exactly as much as they invest or consume" so that capitalists "determine their own profits by the extent of their investment and personal consumption" (p. 79). In his *Theory of Economic Dynamics* (1954) Kalecki wrote that capitalists "can decide to consume and invest more in a given period than in the preceding period, but they cannot decide to earn more. It, is therefore, their investment and consumption decisions which determine profits, and not vice versa" (Kalecki 1991, p. 240). Profits "in a given period are the direct outcome of capitalist consumption and investment in that period" (p. 244). More formally, profits at a time t are a linear function of investment at time t and previous times $t - \lambda$; profits "will thus be a function both of current investment and of investment in the near past; or roughly speaking, profits follow investment with a time lag" (p. 247). In turn, "investment at a given time is determined by the level and rate of change in the level of investment at some earlier time" (p. 292).

The final version of the Kaleckian theory of the business cycle would be the one presented in his publications of the late 1960s. In "The Marxian equations of reproduction and modern economics" (1968), Kalecki again presented investment and capitalist consumption as the independent variables that determine the levels of national income and profits (Kalecki 1991, p. 461). In the introduction to *Selected Essays on the Dynamics of the Capitalist Economy 1933–70*, published posthumously in 1971, Kalecki explained that the theory of economic demand that he had formulated in the 1930s had remained unchanged; however, "there is a continuous search for new solutions in the theory of investment decisions." But he included in the book his theory of profits of 1954, restating his view that it is "investment and consumption decisions which determine profits, and not vice versa" (Kalecki 1971, p. 79).

According to Asimakopulos (1977, p. 329), Kalecki "emphasized a double-sided relation between investment and profits." It is true that in a number of places Kalecki argues that investment depends on profits, or that profitability stimulates investment. He argues for instance that the rate of investment decisions is influenced by the increase in profits per unit of time, so that rising profits "from the beginning to the end of the period considered renders attractive certain projects which were previously

considered unprofitable, and thus permits an extension of the boundaries of investment plans in the course of the period" (Kalecki 1991, p. 282). For Asimakopulos (1977, p. 339) Kalecki poses current investment as predetermined by past decisions, and through its effects on sales and profits contributing to determine expected profitability. In turn, this expected rate of profit influences, along with other factors, the investment decisions made in this period for implementation in future time periods. Even in this presentation, however, investment is the *causa causans* (the cause of the cause), while profits are just an intermediate link in the causal chain. Considering the major works in which Kalecki presented his macroeconomic theory, it is difficult to disagree with the way Targetti and Kinda-Hass (1982, p. 254) summarize it: "[T]he level of profits at a certain date is entirely and solely determined by past decisions to invest." Even allowing for subtleties, in Kalecki the determination is from rising investment to rising profits, and in the relation there is little room, if any, for reverse causation.

4. Investment Leading the Cycle: The Keynesian School

For Joan Robinson (1979) Keynes had presented in *The General Theory* a scheme of comparative statics, though containing key elements to develop a dynamic theory. It was left for economists following Keynes's tradition to develop such a theory, that is, a Keynesian theory of the business cycle. Leaving aside Kalecki, *The Trade Cycle* by Robin C. O. Matthews, published in England in 1959 and republished in the United States as *The Business Cycle*, can arguably be considered one of the first systematic examinations of business-cycle theory from an explicitly Keynesian point of view.[5] Judging by the authors cited and the ideas discussed, it seemed that Matthews was open minded toward recent ideas of Paul Samuelson, J. R. Hicks, Milton Friedman, and others who were making powerful inroads in economics in the 1950s. The general perspective of the book, however, is plainly Keynesian. Matthews repeatedly also cited Michal Kalecki's *Theory of Economic Dynamics*, at that time the most recent presentation of Kalecki's macrodynamic ideas.

Matthews opened his book with a discussion of the variables that may produce an imbalance between aggregate demand and aggregate supply. When briefly mentioning Slutsky's views on recessions being the consequence of the economy responding to random shocks of a diverse character, Matthews commented that statistical data indicate "that economic fluctuations are not due *solely* to random factors, and it is also

clear both from an *a priori* reasoning and from our more detailed knowledge of history that certain forces do operate which are in principle capable of causing fluctuations of a systematic character" (p. 202, emphasis in the original). This was shrewdly suggesting that the business cycle is a rather endogenous economic phenomenon, in which random factors may indeed have some influence—which probably would be agreed by any author espousing an endogenous theory of the business cycle.

According to Matthews, "The doctrine that consumption expenditure depends principally on the level of national income is one of the foundations of Keynesian economics. It is because of this doctrine that the other main component of national income, investment, is regarded as the prime mover in fluctuations in national income, the role of consumption being a passive one" (p. 113). To discuss the basic determinants of investment must therefore be a key aspect of the theory of the business cycle. In this respect, the major consideration "affecting the inducement to do investment is profitability. Investment will be done if the expected profits represent an adequate return on the sum spent. The physical relation between output and capital is important only in so far as it influences the expected rate of return on investment" (p. 34). In other words, "the basic postulate is that the amount of investment done is a function of the expected rate of return. If conditions are such as to promise a high rate of return, much investment will be done, and conversely. There will be a certain critical level of expected returns at which zero net investment is done" (p. 36).

Matthews meticulously considered the relation of investment with competition, technical progress, animal spirits, finance, inventories, and home construction. His conclusion was that "the chief reason for the waves of high and low investment that are the essence of the cycle is the existence of a cumulative effect by which if investment in any period is high relative to its long-run trend value, it encourages investment in the next period to stay high or to rise further, up to a point, while if investment is low it likewise discourages investment in the next period" (p. 82). This means that with appropriate investment the economy would grow without interruption, and slumps would be avoided: "If entrepreneurs can only screw themselves up to do enough investment, it will eventually justify itself, since the income generated will absorb the excess capacity" (p. 178).

A comparison of the theories of the business cycle in Matthews's *Trade Cycle* and in Hyman Minsky's *Stabilizing an Unstable Economy*, written

and published three decades later, reveals many common views but also some major differences in emphasis and even in conception. Both Matthews and Minsky were self-professed Keynesians, but Minsky's view of economic fluctuations emphasized the financial factors creating economic disturbances and leading to financial crises and recessions, while Matthews was quite adamant that business cycles are phenomena mostly related to the real economy, in which their causes need to be examined. For Matthews it was an outdated view

> that the causes of fluctuations lay wholly or largely in the sphere of money and finance. The trend of opinion has now swung in the opposite direction. Most modern theoretical treatments of the cycle are based on an analysis of real forces, and it is implicitly assumed that secondary importance, at most, attaches to any effects that may be brought about by changes in the cost and availability of finance. (Matthews 1959, p. 128)

After a detailed discussion of factors leading to speculation and bubbles in different markets, Matthews had concluded that financial crises generally occur after the downturn in the real economy has already started, so that the financial crisis may aggravate the downturn but does not cause it. The contrast is patent with the main thrust of *Stabilizing an Unstable Economy*, where Minsky emphasizes the role of financial factors and criticizes the neoclassical synthesis for its inability to recognize that "the instability so evident in our economy is due to the behavior of financial markets, asset prices, and profit flows" (Minsky 2008, p. 156).

According to Minsky, a basic aspect of modern capitalism is that past financing of investment leaves a legacy of payment commitments, and for these commitments to be fulfilled the income of indebted investors must be sufficient. The price system must therefore "generate cash flows … which simultaneously free resources for investment, lead to high enough prices for capital assets so that investment is induced, and validate business debts. For a capitalist system to function well, *prices must carry profits"* (p. 158, original emphasis).

What are the determinants of profits is thus a key question, and Minsky concludes that "[*i*]*nvestment and government spending call the tune for our economy because they are not determined by how the economy is now working*. They are determined either from outside by policy (government spending) or by today's views about the future (private investment)" (p. 184, original emphasis). Causality, then, "runs from investment and

government spending to taxes and profits," and in recessions "Big Government, with all its inefficiencies, stabilizes income and profits. It decreases the downside risks inherent in a capital-intensive economy that has a multitude of heavily indebted firms" (p. 186).

Investment is therefore the basic determinant of the dynamic status of the economy. To look for economic factors causing investment to rise or fall is beside the point, since the present level of investment determines the present level of income and the future level of profits and investment. In the colorful words of Minsky, government spending and investment "call the tune." Only the psychological sphere of expectations remains as the source of investment fluctuations. Given adequate investment, profits will rise and the economy will grow.

It is investment, then, which in the view of Kalecki, Keynes, and the Keynesians "calls the tune" by determining profits and thus leading the business cycle.

5. Profits Leading the Cycle: Marx and Mitchell

Karl Marx and Wesley Mitchell are infrequently cited in modern discussions on macroeconomic issues, perhaps because compared with predominant neoclassical or Keynesian views they provide quite a different perspective on how our economy works. Marx and Mitchell share with the Keynesian school the view that investment, or capital accumulation in Marx's terminology, is a key variable in economic dynamics.[6] However, neither Marx nor Mitchell attributes to investment the major causal role in business cycles, because they see investment as depending itself on profitability.

Marx's analysis of the business cycle has been considered an unwritten chapter, and "no coherent picture of it has emerged, or is likely to emerge, that would command the approval of all Marxologists." This opinion of Schumpeter (1954, p. 747) still looks true, as proven by recent controversies already cited. However, some particular elements of Marx's theory of crises are not controversial. What Marx called the industrial cycle, or cycle of crises—in which periods of capital accumulation alternate with crises—is mostly discussed in manuscripts that were posthumously published by Engels or others. In one of them, Marx wrote that the rate at which the capital is valorized, that is the rate of profit, "is the spur to capitalist production (in the same way as the valorization of capital is its sole purpose)," so that a decline in this rate "slows down the formation of new, independent capitals and thus appears as a threat to the

development of the capitalist production process; it promotes overproduction, speculation and crises" (Marx 1981b, pp. 348–49). In his notebooks published as *Theories of Surplus Value*, Marx asserted that accumulation is determined "by the ratio of surplus-value to the total capital outlay, that is, by the rate of profit, *and even more by the total amount of profit"* (Marx 1968, p. 542, emphasis added).

Explicit insights on crisis theory are also given in the only volume of *Capital* that Marx published himself, in 1867. There, in the chapter on "the general law of capitalist accumulation," Marx stated that the characteristic evolution of modern economies is typically a ten-year cycle in which periods of average activity are followed by production at high pressure, crisis, and finally stagnation (Marx 1977, p. 785). In the manuscripts written in the late 1870s, published by Engels as volume 2 of *Capital*, Marx speculated that the crisis cycle is a periodic phenomenon, related with an average period of ten years for the renovation of fixed capital, though the precise periodicity "is not important" (Marx 1981a, p. 264).

Marx rejected Say's law, as he saw absolute overproduction—overproduction affecting all fields of production and not only a few important spheres of production—as typical of periods of economic crisis in which there is insufficient surplus value, that is, profits, to valorize capital. In these periods profits decline "at a point … when the increased capital produced just as much, or even less, surplus-value than it did before its increase … i.e., the increased capital $C + \Delta C$ would produce no more, or even less, profit than capital C before its expansion by ΔC" (Marx 1981b, pp. 359–60). In no place did Marx describe economic crises as being long periods of stagnation; indeed he emphasized them as being short phenomena, and he rejected in plain terms Ricardo's idea of a permanent crisis (Marx 1968, p. 497).

In multiple publications on economic issues in the 1840s, the 1850s, and the early 1860s, Marx paid attention to the concrete timing and periodicity of economic crises in England and other countries. He hesitantly referred to the recurrence of crisis by citing periods of about five, six, or seven years. However, in the first volume of *Capital* he proposed that crises had a decennial periodicity (Marx 1977, p. 790). We can compare Marx's view of what he usually called the industrial crisis cycle with Burns and Mitchell's definition of the business cycle, which describes the recorded facts of about two centuries of capitalism by establishing a varying length of the recurrent phenomenon:

> Business cycles are a type of fluctuation found in the aggregate economic activity of nations that organize their work mainly in business enterprises: a cycle consists of expansions occurring at about the same time in many economic activities, followed by similarly general recessions, contractions, and revivals which merge into the expansion phase of the next cycle; in duration, business cycles vary from more than one year to ten or twelve years; they are not divisible into shorter cycles of similar characteristics. (Burns and Mitchell 1946, p. 3)

In *Capital* Marx presented the periods of capital accumulation—that is, economic expansions with high levels of investment—as characterized by an increased demand for labor power, such that during the cycle there is a constant formation, absorption, and reformation of a mass of unemployed workers—the "industrial reserve army." This mass of unemployed workers, "during the periods of stagnation and average prosperity, weighs down the active army of workers; during the periods of overproduction and feverish activity, it puts a curb on their pretensions" (Marx 1977, p. 792).

Periods of capital accumulation are the most favorable for workers in terms of income because "a larger part of the mass of profits, which is increasing and is continually transformed into additional capital, comes back to them in the shape of means of payment, so that they can extend the circle of their enjoyments, make additions to their consumption fund of clothes, furniture, etc. and lay by a small reserve fund of money" (Marx 1977, p. 796).

The tightness of the labor market during periods of expansion will likely produce a rise in wages, and then two things can happen:

> Either the price of labour keeps on rising, because its rise does not interfere with the progress of accumulation…. Or, the other alternative, accumulation slackens as a result of the rise in the price of labour, because the stimulus of gain is blunted. The rate of accumulation lessens; but this means that the primary cause of that lessening itself vanishes…. The mechanism of the process of capitalist production removes the very obstacles that it temporarily creates. (p. 770)

Marx portrays the level of investment as a function of profitability, as it is shown by his reference to accumulation slackening "because the stimulus

of gain is blunted." On the other hand, a profit-squeeze mechanism is also suggested, since Marx admits that rising wages might cut profits and in this way induce a fall in the rate of investment that triggers a downturn. This is offered as a possibility, but in the same paragraph Marx rejects the implied causal pathway as an important one. He emphatically explains it by using a mathematical terminology that is uncommon in his writings: "To put it mathematically: the rate of accumulation is the independent, not the dependent, variable; the rate of wages, the dependent, not the independent, variable." In causal language this means that a rising or falling rate of accumulation is the cause of respectively rising or falling wages, not the other way around.

Profit is for Marx the monetary translation of surplus value, unpaid labor supplied by the working class to the owners of capital. When profit "accumulated by the capitalist class increases so rapidly that its transformation into capital requires an extraordinary addition of paid labour, then wages rise, and, all other circumstances remaining equal," profit diminishes. But as soon as this diminution reaches the point at which profit that nourishes capital "is no longer supplied in normal quantity, a reaction sets in: a smaller part of revenue is capitalized, accumulation slows down, and the rising movement of wages comes up against an obstacle. The rise of wages therefore is confined within limits that not only leave intact the foundations of the capitalist system, but also secure its reproduction on an increasing scale" (Marx 1977, p. 771). Marx emphasized the idea that accumulation depends on profitability by quoting in *Capital* the opinion of the English trade unionist Thomas Dunning, who had written that capital

> eschews no profit, or very small profit, just as Nature was formerly said to abhor a vacuum. With adequate profit, capital is very bold. A certain 10% will ensure its employment anywhere; 20% certain will produce eagerness; 50%, positive audacity; 100% will make it ready to trample on all human laws; 300%, and there is not a crime at which it will scruple, nor a risk it will not run, even to the chance of its owner being hanged. If turbulence and strife will bring a profit, it will freely encourage both. (cited in Marx 1977, p. 926)

Marx took a critical stance on underconsumptionism in one of his late manuscripts, apparently written in 1878, and published by Friedrich Engels in 1885 as volume 2 of *Capital*. In a passage in chapter 20 of

Engels's edition, Marx made explicit his stance against underconsumption views:

> It is a pure tautology to say that crises are provoked by a lack of effective demand or effective consumption. The capitalist system does not recognize any forms of consumer other than those who can pay, if we exclude the consumption of paupers and swindlers. The fact that commodities are unsaleable means no more than that no effective buyers have been found for them, i.e. no consumers (no matter whether the commodities are ultimately sold to meet the needs of productive or individual consumption). If the attempt is made to give this tautology the semblance of greater profundity, by the statement that the working class receives too small a portion of its own product, and that the evil would be remedied if it received a bigger share, i.e. if its wages rose, *we need only note that crises are always prepared by a period in which wages generally rise, and the working class actually does receive a greater share in the part of the annual product destined for consumption*. From the standpoint of these advocates of sound and "simple" (!) common sense, such periods should rather avert the crisis. It thus appears that capitalist production involves certain conditions independent of people's good or bad intentions, which permit the relative prosperity of the working class only temporarily, and moreover always as a harbinger of crisis. (Marx 1981, pp. 486–7, emphasis added)

Is this passage an anomaly in Marx's theory? For many Marxists who maintain underconsumptionist views, it would be, as a frequently cited passage of the third volume of *Capital* states that "[t]he ultimate reason for all real crises always remains the poverty and restricted consumption of the masses as opposed to the drive of capitalist production to develop the productive forces as though only the absolute consuming power of society constituted their limit" (Marx 1981b, p. 615). This is in the manuscript that Engels edited as volume 3 of *Capital*. It had been written by Marx in the mid-1860s, that is, some twenty years before he wrote his mocking remarks on the idea that crises are caused by low wages. So he could have changed his views. Whatever the case, what is important is that the lack of consumption because of low wages is a very poor explanation of the economic slumps that we observe in reality. Marx saw it in his time, and

data on downturns of recent years also prove it, as will be shown in section 6 of this chapter.

As economic thinkers and public personalities, Mitchell and Marx are obviously quite different cases. Marx rejected from his first intellectual contributions what he called the bourgeois views of political economy, persistently titled his books as critiques of such discipline, and was paid in kind by being mostly ignored and later plainly rejected by those who claimed to be developing such science. Contrarily Mitchell was throughout his long life a highly respected member of the economic profession who taught economics at leading universities, served in many government committees even in wartime, was once president of the American Economic Association, and was a founding member and for decades director of research of the prestigious NBER. However, in the 1950s his views on the business cycle were trashed as atheoretical, and soon after his death his work disappeared into oblivion.

As already mentioned, the criticism addressed against Mitchell that his contributions lacked theory contrasts with the reality that he had presented quite elaborate views on the causes of expansions and recessions—that is, a theory of the business cycle—as early as 1913. In his unfinished *What Happens during Business Cycles*, which was published in 1951 after his death, Mitchell briefly restated his ideas—which had changed remarkably little since 1913—on the causes of the business cycle. He still viewed the cycle as a continuous endogenous development, with recession processes leading to expansion, and expansion processes leading to recession. Investment played a key role in the transitions from expansion to recession and vice versa. Though capital goods, Mitchell noted, "form less than 18% of the gross national product, their output is subject to such violent alternations … that this minor segment of the economy contributes 44% of the total cyclical fluctuation in output, and nearly half of the cyclical declines" (Mitchell 1951, p. 153).

For Mitchell profits had a major role in economics in general, and in business cycles in particular. This was probably the result of both his empirical studies of business and economic life and his acquaintance with Thorstein Veblen, one of the proponents, according to Mitchell himself, of the theory that profit is the key variable explaining economic fluctuations (Mitchell 1927, pp. 42–44). The Veblenian influence seems clear in Mitchell's view of what he called "the money economy," the organization of the modern industrial society in which the bulk of economic activity takes place through the activities of enterprises that perform with the

purpose of producing money profit. For Mitchell, in economic circumstances where the money economy predominates, that is, where economic activity takes the form of making and spending money incomes, "natural resources are not developed, mechanical equipment is not provided, industrial skill is not exercised, unless conditions are such as to promise a money profit to those who direct production" (Mitchell 1913, pp. 21–22).

In one of his late contributions, Mitchell insisted on the centrality of money profits for understanding business cycles:

> Since the quest for money profits by business enterprises is the controlling factor among the economic activities of men who live in a money economy, the whole discussion [of expansions and recessions] must center about the prospects of profits. On occasion, indeed, this central interest is eclipsed by a yet more vital issue – the avoidance of bankruptcy. But to make profits and to avoid bankruptcy are merely two sides of a single issue – one side concerns the well-being of business enterprises under ordinary circumstances, the other side concerns the life or death of the same enterprises under circumstances of acute strain. (Mitchell 1941, p. xii)

In Mitchell's endogenous theory of the business cycle during the phase of prosperity, the very conditions "which make business profitable gradually evolve conditions which threaten a reduction in profits" (Mitchell 1913, p. 502). Though economic downturns often start with a financial crisis in which banks, insurance companies, and other financial firms go bankrupt, these financial phenomena are preceded by processes that encroach profits in the real economy, at least in a score of major enterprises or industrial sectors. The various stresses rising costs and putting caps on revenue, and thus limiting profits,

> become more severe the longer prosperity lasts and the more intense it becomes, and since a setback suffered by any industry necessarily aggravates the stress among others by reducing the market for their products, *a reduction in the rate of profits* [emphasis added] must infallibly occur … if an average rate of profits could be computed for a whole country, it would not be surprising to find it reaching its climax just before the crisis breaks out. But this result would not mean that there had been no

> serious encroachment upon profits. On the contrary, it would mean that the critical point is reached and a crisis is precipitated as soon as a decline of present or prospective profits has occurred in a few leading branches of business and *before that decline has become general* [original emphasis]. (Mitchell 1913, p. 503)

Rejecting underconsumptionist explanations that view insufficient demand for consumption goods as the trigger of downturns, Mitchell explained that in the late phases of prosperity, "the impossibility of defending profits against the encroachments of costs is experienced earlier by enterprises which handle raw materials and producers goods…. The technical journals usually report that the factories and wholesale houses are restricting their orders some weeks, if not months, before they report that retail sales are flagging" (Mitchell 1913, p. 502).

The decline in profitability in some parts of the economy creates financial strain and reduces sales in other industries, all of which in turn reduce the incentive to maintain or increase inventories. Investment in wages, raw materials, and new machines or production facilities also falls, which eventually reduces the level of business activity, since business failures and reduction of business activity cut both wages and investment, the two basic sources of demand. This vicious cycle would then operate for months or years, sending the economy into a minor or major recession or depression. Eventually the "very conditions of business depression beget a revival of activity," favorable conditions for investment are newly created and the economy starts expanding again (Mitchell 1913, p. 452). This is so because immediately after a depression "within large groups of enterprises or industries, the rate [of profit] rises promptly with the tide of prosperity…. Indeed it is certain in particular cases and probable on the average *that profits begin to pick up before the period of depression is over"* (Mitchell 1913, p. 469, emphasis added). This will increase the volume of investment because in such a situation of business revival, "the prospect of good profits leads not only to greater activity among the old enterprises, but also to extensions of their size and to the creation of new enterprises. This expansion of business undertakings is the more important because for a time at least it imparts new energy to the very causes which produced it" (Mitchell 1913, p. 471).

In spite of all their differences, Marx and Mitchell coincide in asserting an important economic regularity: that rising profitability is the key determinant, via expanding investment, of business prosperity; and that

falling profitability is the key determinant, via falling investment, of depression.

6. Empirical Evidence

Richard Goodwin once explained that the first attempts to subject business cycles to econometric analysis were those of Jan Tinbergen in the two monographs published in 1939 for the League of Nations. At that time, on the basis of general agreement among economists, Tinbergen selected investment "as the crucial cycle variable to be explained" (Goodwin 1964).

Now, in terms of causation, from the Keynesian-Kaleckian perspective investment is the key variable that determines profits, while for Marx and Mitchell the direction of causality is the opposite, with investment determined by profits. An additional issue that will be examined here is whether lack of consumption and low wages show any ability to explain recessions, as many authors claim. Does the empirical evidence support these views?

Descriptive statistics

It has been known since long ago that the main element of aggregate demand fluctuating upward during expansions and downward during recessions is investment, while consumption varies little between expansion and recession (Mitchell 1951; Sherman and Kolk 1997). In the US national income and product accounts (NIPA) for the years 1929–2013, the mean shares in the gross national product (GNP) are 63.8 percent for consumption, 32.0 percent for government expenditure, 15.4 percent for gross investment, 10.8 percent for business investment, 8.2 percent for profits before taxes, and 5.9 percent for profits after taxes. This shows that the "big bills" in "the economy" are consumption and government spending, but these two variables are much less volatile than the others, as for these shares in GNP the coefficients of variation (the ratio of the standard variation to the mean) are 9.3 percent for consumption, 23.0 percent for government expenditure, 23.7 percent for business investment, 28.4 percent for profits before taxes, and 29.3 percent for profits after taxes. Thus, measuring the macroeconomic variables as shares of GNP, the variability of investment is much greater than the variability of consumption, but profits are much more volatile than any other variable.

Year	W&S	U	G	I	C	P	Year	W&S	U	G	I	C	P
1970	1.1	1.4	4.5	−1.4	3.8	−18.2	1993	1.4	−0.6	0.7	5.2	3.6	8.1
1971	0.9	1.1	3.6	−0.4	3.0	11.6	1994	2.9	−0.8	0.9	6.5	3.8	19.7
1972	4.8	−0.4	4.2	7.8	5.2	11.2	1995	3.4	−0.5	2.7	8.5	3.0	9.9
1973	5.2	−0.7	2.4	11.7	4.9	4.4	1996	3.9	−0.2	1.5	6.5	3.8	10.1
1974	0.0	0.7	3.6	1.6	0.5	−16.2	1997	5.4	−0.4	1.2	8.3	3.8	9.0
1975	−3.5	2.9	5.5	−5.8	1.4	5.0	1998	6.7	−0.5	1.5	7.9	5.0	−8.5
1976	4.7	−0.8	1.4	5.6	5.6	20.4	1999	5.2	−0.3	3.1	7.2	5.3	−0.4
1977	4.1	−0.6	1.4	11.3	4.5	11.4	2000	5.8	−0.2	2.7	7.3	5.3	−12.3
1978	5.3	−1.0	3.0	13.5	4.4	8.0	2001	0.4	0.7	4.3	−4.8	2.2	−10.1
1979	3.3	−0.3	2.5	9.8	3.0	−8.2	2002	−0.7	1.1	4.5	−8.6	2.4	26.3
1980	0.5	1.3	5.2	−0.2	1.2	−19.5	2003	0.8	0.2	4.0	−0.3	3.1	16.6
1981	0.6	0.5	3.3	6.2	0.9	5.8	2004	2.7	−0.3	2.8	3.8	3.5	18.0
1982	−1.0	2.1	4.1	−3.3	0.9	−14.6	2005	1.7	−0.4	3.4	6.7	3.1	11.3
1983	1.7	−0.1	4.5	−4.4	6.1	19.3	2006	3.2	−0.5	2.8	6.9	2.6	8.9
1984	6.2	−2.1	3.8	13.0	5.5	18.9	2007	2.8	0.0	3.7	5.3	2.1	−17.6
1985	4.1	−0.3	5.6	4.4	5.6	1.8	2008	0.2	1.2	4.7	−0.9	0.8	−26.7
1986	4.0	−0.2	4.7	−2.0	4.3	−11.7	2009	−5.1	3.5	6.1	−16.5	−2.4	17.4
1987	4.7	−0.8	2.7	−1.2	4.1	9.0	2010	0.8	0.3	2.9	0.3	2.4	28.4
1988	4.4	−0.7	1.6	4.0	4.6	8.7	2011	1.9	−0.7	−0.9	7.1	2.7	1.1
1989	1.9	−0.2	3.6	4.1	3.3	−6.6	2012	2.6	−0.8	−0.9	6.9	1.9	14.2
1990	2.4	0.3	3.9	−0.5	2.7	−5.2	2013	1.2	−0.7	−1.0	2.6	2.1	3.6
1991	−0.6	1.2	1.9	−5.3	0.2	6.4	2014	3.6	−1.2	0.8	6.0	2.4	−1.9
1992	3.0	0.7	5.6	0.2	4.1	4.9							

Table 3.1. Annual growth of wages and salaries (W&S), unemployment rate (U), government expenditure (G, computed as current expenditure plus gross government investment), gross private domestic investment (I), personal consumption expenditure (C), and corporate profits (before taxes) of domestic industries (P), 1970–2014. Source: BEA, NIPA, author's calculations.

The figure for the monetary variables is the percent rate of growth, computed from nominal NIPA data transformed into 2009 dollars by using the GDP deflator, also from NIPA. The figure for the unemployment rate is the annual variation in percentage points, computed from statistics of the Department of Labor.

Basically the same is shown by the rates of growth of the components of the national product measured in real terms. Table 3.1 presents the annual change of wages, unemployment, government expenditure, investment, consumption, and profits in the forty-five years between 1970 and 2014. Just a general examination of the table attending to the signs of the figures indicates that consumption has the lowest volatility: except in one year, 2009, in which its rate of growth is negative, consumption always grows at a rate of a few percentage points (3.1 percent per year is the mean rate of growth for the 45-year sample). Profits reveal the highest volatility, as they often increase or decrease at two-digit rates; thus they decreased 17.6 percent in 2007 and 26.7 percent in 2008, immediately before the Great Recession, but then they grew 17.4 percent and 28.4 percent in 2009 and 2010. The volatility of the annual changes of these series as quantified by the coefficient of variation for the years 1970–2014 is 56.0 percent for consumption, 102.2 percent for wages, 194.4 percent for investment, and 344.9 percent for profits. While during this period of forty-five years real consumption only decreased once, in 2009, wages and salaries decreased in each period of recession, that is, in 1975, 1982, 1991, 2002, and 2009 (table 3.1). The year 2009, in which profits increased 17.4 percent and wages and salaries shrank 5.1 percent, saw the greatest annual contraction of consumption (–2.4 percent) and wages (–5.1 percent) in the

whole period. The correlation of consumption with wages and salaries—with both series in annual rate of growth—is very strong and positive, 0.82, revealing that most consumption comes from wages and salaries, so that the two series basically rise or fall at the same time.

The unemployment rate rises when there is a recession. Table 3.1 shows that in 2009 during the Great Recession, the rate of unemployment rose 3.5 percentage points, the greatest annual increase in the sample 1970– 2014. Since recessions are the periods in which wages and salaries typically decrease, the annual change in unemployment has a very strong and negative correlation (–0.84) with the change in wages and salaries, and also with the annual change in consumption (–0.80). The correlations of consumption and wages with investment are respectively 0.58 and 0.79, indicating that all these variables tend to increase in expansions and to decrease in recessions, though the movements are less synchronized between them than those of consumption with wages. Finally the annual growth of profits correlates weakly (just 0.24) with consumption and has almost zero correlation (0.03) with the rates of growth of both investment and wages, which indicates that profit moves almost without any synchronization with investment and wages during the business cycle. As we will see, this is because profits rise (or fall) *before* investment and wages rise (or fall). Thus profits are a leading variable with respect to investment and wages, which are lagging variables with respect to profits.

The annual change in unemployment has a strong and negative correlation (–0.81) with the annual growth in investment. This is because a recession is precisely characterized by falling investment, which immediately causes rising unemployment, while an expansion is characterized by rising investment, which implies hiring of workers and falling unemployment.

Rates of growth of income flows along the phases of the business cycle and in the vicinity of its turning points provide major insights to ascertain what is going on during business cycles and what the most likely directions of causation are. But to examine what happens in the vicinity of turning points of the business cycle, quarterly data are needed, as annual data are too gross to reveal important details.

Rates of growth of income flows

Table 3.2 is computed using NIPA data corresponding to 275 quarters of the US economy between 1947 and 2015. I use the NBER chronology to date business cycles, assuming that a recession starts in the peak quarter

and ends in the next trough quarter, with both peak and trough quarters considered as part of the recession (this is an arbitrary choice; any other would do). All rates of growth were computed with variables adjusted for inflation by transforming nominal figures from NIPA into 2009 dollars. The second and third lines of the table present the mean rate of growth of the variables for the quarters classified by pertaining either to an expansion (225 quarters) or a recession (50 quarters). Then the expansion quarters and the recession quarters are further classified by the proximity to the turning points of the cycle. Thus "peak –7" refers to the sample that includes all *expansion* quarters that preceded the next recession by seven quarters; "trough +1" refers to the expansion quarters immediately following the end of the recession, and so forth. According to the NBER chronology in the period 1947–2015, there were eleven recessions in the US economy; therefore table 3.2 presents the mean rate of growth of profits, investment, and so on in the eleven quarters that were peak quarters, in the eleven quarters that were trough quarters, and the eleven expansionary quarters that were immediately following the trough (trough +1). However, not all eleven recessions in the sample were preceded by five quarters of expansion; for that reason the table presents classified as "peak –5" the average rates of growth of the variables for only ten quarters. Since several recessions lasted only three quarters, only seven cases are available to compute the mean rates of growth in the third recession quarter after the peak (peak +3).

Period	Profits		Investment	Wages & Sal.		N
	Before T.	After T.		Without Sup.	With Sup.	
All quarters	0.8	0.9	1.6	0.7	0.8	275
Expansion	1.8	1.7	2.2	1.0	1.0	225
Recession	–3.7	–2.6	–1.1	–0.4	–0.3	50
Peak –7	3.1	3.2	2.8	1.5	1.5	10
Peak –6	1.5	2.2	1.7	0.9	0.9	10
Peak –5	0.0	0.4	2.8	1.3	1.2	10
Peak –4	–0.9	–1.0	3.5	1.0	0.9	10
Peak –3	–0.7	–1.1	1.6	1.1	1.1	11
Peak –2	0.0	0.1	2.2	0.7	0.8	11
Peak –1	–1.9	–0.8	1.3	0.9	0.9	11
Peak	–2.7	–4.2	0.1	0.4	0.5	11
Peak +1	–7.0	–5.2	–1.5	–0.4	–0.3	11
Peak +2	–5.1	–3.0	–1.2	–0.7	–0.6	11
Peak +3	0.7	0.2	–0.7	–0.4	–0.3	7
Trough –2	–6.7	–7.8	–1.0	–0.3	–0.2	11
Trough –1	–0.1	3.4	–2.2	–1.1	–0.9	11
Trough	–2.4	–0.7	–0.9	–0.8	–0.6	11
Trough +1	9.5	10.4	1.9	0.5	0.7	11
Trough +2	7.1	6.1	2.9	1.2	1.3	11
Trough +3	5.0	5.0	3.4	0.9	1.0	11
Trough +4	4.9	5.9	3.1	1.6	1.7	10

Table 3.2. Mean quarterly rates of growth (%) of profits (domestic industries, before and after taxes), fixed private domestic investment, and wages and salaries (with and without supplements) during the recessions and expansions of 275 quarters of the US economy. Shaded areas correspond

to figures for recession quarters, 1947–2015. Source: NIPA quarterly data 1947:II to 2015:IV. For definitions and explanations see text.

On average, in the 275 quarters included in the sample, profits before and after taxes increased, respectively, 0.8 percent and 0.9 percent per quarter, while wages and salaries with or without supplements increased, respectively, 0.8 percent and 0.7 percent (table 3.2, line 1). This shows that inequality of income is steadily increasing in the long run, as on average capital income (profits) is increasing slightly faster than labor income (wages).[7] During expansions, profits before taxes increased on average 1.8 percent per quarter, while during recessions they dropped on average 3.7 percent per quarter. Profits increasing during expansions more than wages and decreasing during recessions more than wages also show that income inequality is procyclical, that is, it grows during expansions and decreases during recessions. This is a fact that many left-wing authors find puzzling, but data not only for the United States but for other countries show it very clearly (Picketty 2014, pp. 288, 296).

Profits after taxes have lower volatility than profits before taxes. Thus profits before taxes grow at a mean rate of 1.8 percent per quarter in expansions and –3.7 percent per quarter in recessions, while profits after taxes grow at 1.7 percent per quarter in expansions and –2.6 percent per quarter in recessions (table 3.2, lines 2 and 3). This suggests that taxation laws are set to facilitate a steady flow of profits and that they dampen to some extent the effects of the economy. Wages and salaries without supplements rise on average 1.0 percent per quarter and drop 0.4 percent per quarter in recessions. Capital income represented by profits (either before or after taxes) is much more volatile than labor income represented by wages and salaries (either with or without supplements). Investment on average grew 2.2 percent per quarter in expansions, and dropped 1.1 percent per quarter in recessions, so that it is more volatile than wages and salaries, but less volatile than profits.

More interesting is to examine the evolution of income flows in the vicinity of the turning points of the business cycle. *Data show that profits stop growing, stagnate, and then start falling a few quarters before the recession, when investment and wages start falling*. Table 3.2 shows that profits before taxes on average grew 3.1 percent in the seventh quarter before the recession started, but then the rate of growth declined as the recession approached, so that in the fifth quarter before the start of the recession they stopped growing and in successive quarters they shrank, and that in the quarter immediately before the peak they shrank 1.9

percent. During the recession, profits before taxes on average contracted 3.7 percent per quarter, but in the peak quarter they contracted only 2.7 percent; they contracted much more (7.0 percent) in peak +1, that is, the quarter following the peak. As the end of the recession gets closer, profits stop falling and profits before taxes basically remain at the same level (–0.1 percent) in the quarter previous to the end of the recession, in which profits after taxes increase by 3.4 percent. Though profits both before and after taxes still decrease in the trough quarter, they quickly recover in the following quarters so that, for instance, profits after taxes increase 10.4 percent in trough +1, the quarter following the end of the recession. The general pattern for profits before and after taxes is that they start decreasing about a year before the recession, have their greatest fall in the first quarters of the recession and stabilize at the end of the recession, to grow quickly immediately after the end of the recession.

Table 3.2 shows that investment starts declining one quarter after the recession started, that is in peak +1, when it decreases 1.5 percent. As shown, profits had started declining about two years before the start of the recession. The largest decrease in investment is at almost the end of the recession, in the quarter trough –1, when investment decreases on average 2.2 percent. Following the end of the recession, investment grows, for example, 1.9 percent in the quarter immediately following the end of the recession, trough +1.

Wages and salaries continue growing even in the quarter in which the recession starts—when they grow 0.4 percent and 0.5 percent without and with supplements respectively—so that they start shrinking in peak +1, when profits have already been falling for several quarters.

Overall, the rates of growth of profits, investment, and wages in the quarters leading up to the recession and during the recession itself show that investment starts falling several quarters after profitability does. A drop in investment because of animal spirits, or any other reason that would trigger a decline in profits à la Keynes and Kalecki, is not consistent with the sequence of events. A fall in wages that triggers a decline in investment and profits, as the underconsumptionist view maintains, is also at odds with the sequence of facts.

Table 3.2 shows that once the recession ends, the recovery of profits is quick, with a quarterly increase close to 10 percent—considering profits either before or after taxes—in the quarters immediately following the end of the recession. In that same quarter, however, wages grow at a very low rate, well below 1 percent, while investment grows at a rate of 1.2 percent.

This is quite inconsistent with the view that an autonomous rise in wages, consumption, or investment would cause the end of the recession.

Are the observed rates of growth of profits, wages, and investment consistent with a profit-squeeze explanation? According to that explanation, wage growth would reduce profits and that would lead to falling investment. Now, table 3.2 shows that profits grow on average at a rate of 1.7 percent or 1.8 percent per quarter during the expansion, while wages and salaries increase at 1 percent per quarter. In the quarters immediately preceding the recession, the growth of wages is faster than the growth of profits, but that is not because wages started growing faster (as the profit-squeeze scheme would imply), but, contrarily, it is because the growth of profits ended and then profits started to decrease. In the previous quarters, profits had been growing at faster rates than wages, for instance, in the seventh expansion quarter before the recession (peak +7) wages had increased 1.5 percent per quarter, while profits before or after taxes had been growing at much greater rates (3.1 percent and 3.2 percent, respectively).

The general pattern inferred from the statistics on 275 quarters of the US economy presented in table 3.2 is on profits falling before investment (at the end of the expansion) and recovering before investment (at the end of the recession). This is also what has happened in recent recessions. For instance, profits were falling in 2007 and 2008 at two-digit rates, while investment still grew at 5.3 percent in 2007 (table 3.1) and only dropped in 2008, by 0.9 percent. During the expansion of the 1990s, profits started declining long before investment dropped in the recession. Thus profits peaked in 1997:III while investment peaked in 2000:IV, as shown by data in real dollars (fig. 3.1, *top panel*) or as shares of GDP (fig. 3.1, *bottom panel*). In 1998, 1999, and 2000 profits dropped while investment was growing (table 3.1), and only in 2001 did both profits and investment drop. In the recession of the early 1990s, investment dropped in 1990 and 1991, and profits had dropped in 1989 and 1990. In the early 1980s, investment decreased in 1980, 1982, and 1983; profits had negative growth in 1979, 1980, and 1982. In the recession of the mid-1970s, the drop in investment in 1975 was preceded by the fall in profits in 1974. The evidence is quite overwhelming that profits peak several quarters before the recession, while investment peaks immediately before the recession. Then profits recover before investment does, as illustrated by the investment trough that occurs around the end of the recession or the start of the expansion but following the profit trough for at least a few quarters (fig. 3.1). In data for the late decades of the nineteenth century and early twentieth, Wesley Mitchell

found that "the rate [of profit] rises promptly with the tide of prosperity" so that "it is certain in particular cases and probable on the average that profits begin to pick up before the period of depression is over" (Mitchell 1913, p. 469). A century later the same can be observed in the recessions of the mid-1970s, 1991, and 2001, and in the Great Recession—in all of which, profits (both before and after taxes) pick up before the recession has ended, when investment is still falling (fig. 3.1). Profits recovered in 2009, 2002, 1991, 1983, and 1975 (table 3.1), while investment only recovered positive growth in 2010, 2004, 1992, 1984, and 1976.

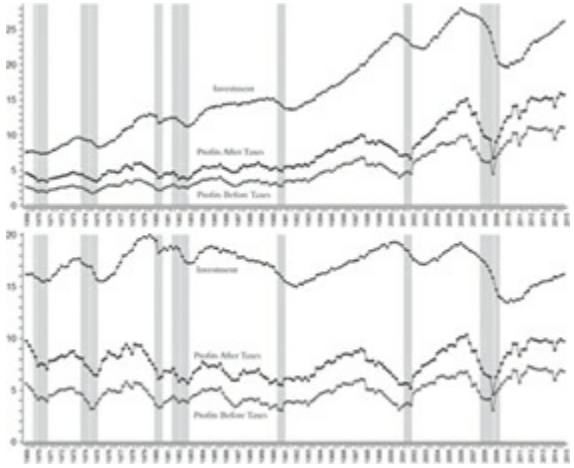

Figure 3.1. Corporate profits and investment, in billion real dollars (top) and as shares of GDP (bottom), from 1969 to the Great Recession. Dark areas are recessions according to the NBER chronology. Source: author's elaboration from quarterly data in NIPA tables 5.1 and 5.3.5, seasonally adjusted at an annual rate (SAAR).

Because of the generally accepted principle that the cause precedes its effect in time (Pearl 2000, p. 42), data in table 3.2 support the hypothesis of causality from rising or falling profits to respectively rising or falling investment. But they do not support causality in the opposite direction, from rising (or falling) investment to rising (or falling) profits, because investment is generally rising in the late quarters of the expansion when profits start falling, and then investment is falling in the late quarters of the recession when profits start growing again. Data, however, support negative causality from investment to profits, that is, rising investment leading to falling profits or falling investment leading to rising profits.

A recovery of profits after a slump that were dependent, à la Keynes-Kalecki-Minsky, on a recovery of investment would imply some lag for investment spending to be translated into increased profits for firms selling either capital goods to other firms, or consumer goods to wage workers hired as the result of new investment. But the data (fig. 3.1, tables 3.1 and

3.2) do not indicate the existence of that lag. Contrarily, what they show is a lag in the other direction, that is, changes in profits being followed by changes in investment. As will be seen in the next section, the regression analysis provides further evidence that changes in profits are followed by changes in investment *in the same direction*. However, it also provides evidence of movements in investment being followed by movements in profits *in the opposite direction*, a fact that is completely at odds with the expected causal link implied by the Keynesian scheme.

Regression analysis: profits and investment

Regression models provide a way to explore the potential causal links between profits and investment by testing how changes in investment predict changes in profits, and vice versa. I have investigated these relations by regressing the rates of growth of a variable on present and lagged values of the rate of growth of the other variable. I tried this method using both quarterly rates of growth (Tapia 2013) and annual rates of growth of profits and investment (Tapia 2015). Vector auto regression (VAR) models including both variables, or a larger set of variables, indicate similar effects.

In regression models using quarterly rates of growth, profits—particularly profits before taxes—predict significantly investment, while the change in investment does not predict significantly the change in profits (Tapia 2013, table 3.2, panels I and III). Considering the model with the best fit, the rates of growth of profits before taxes during the present quarter and the five former quarters have a very significant and positive effect on the rate of growth of investment, with 44 percent of the variation in the rate of growth of investment explained by the variation in profits (Tapia 2013, table 3.2, panel I, model F). Profits after taxes during the present quarter and previous quarters also have a noticeable effect on investment, but the effect is much weaker, and, compared with profits before taxes, the proportion of change in investment explained is considerably reduced, just 32 percent. In the other potential direction of causation, lag regressions do not provide evidence of investment growth predicting the rate of growth of future profits (Tapia 2013, table 3.2, panel III). The effect at lag zero is very strong and positive, but obviously in a regression model the lag-zero effect is consistent with causality in any direction. But in these models computed with quarterly rates of growth, lagged effects of investment on profits are not statistically significant, and

they even have "the wrong sign"—that is, past investment had a *negative* effect on present profits.

In regression models using annual data from 1934–2014, I found similar results with some important differences. Rates of growth of profits and investment significantly predict the other variable with a lag of one or two years, but rising profits predict rising investment while falling investment predicts falling profits (Tapia 2015). In regressions using data for the years 1991–2013, in the models with the best fit (i.e., the lowest Akaike Information Criterion [AIC], that which produces a probability distribution with the smallest discrepancy), investment at year $t - 1$ has a negative significant effect (–0.77, $P < 0.05$) on profits after taxes at year t, while profits at years $t - 1$ and $t - 2$ have positive significant effects (0.26, $P < 0.05$, and 0.32, $P < 0.001$, respectively) on investment.

Thus I find a negative statistical effect of investment on profits in regressions with both annual and quarterly data, but the effect is statistically significant in the annual analysis only. The lack of statistical significance in the quarterly analysis may be explained by the fact that quarterly data are noisier than annual data, so that the signal is buried in the noise. Whatever the case, if past investment were determining present profits in the Keynesian way, we would expect significant *positive* lagged effects of investment on profits. However, in regression using either quarterly or annual data, the observed lagged effects of investment on profits are *negative*, though not always significant, while lagged effects of profits on investment are always statistically significant and *positive*. These results are consistent with profits determining investment, à la Marx and Mitchell, but they are inconsistent with investment determining profits, à la Keynes, Kalecki, and Minsky.

Granger-causality tests: profits and investment

The results of tests to assess Granger causality between profits and investment are sensitive to the number of lags included in the test. When many lags are included in the test regression, bidirectional Granger causality usually appears, with past profits helping to predict investment and past investment helping to predict profits. However, the null hypothesis that profits before or after taxes do not help to predict investment is rejected at very high levels of significance in all lag specifications I tried, while the hypothesis that investment does not help to predict profits often could not be rejected even at the 5 percent level of significance (Tapia 2013, table 2.3, panels A and C). Overall, causality

from profits to investment is strongly supported by Granger tests at all lags, while that is not the case for causality from investment to profits.

7. Discussion

Explanations of recessions as being caused by lack of purchasing power due to a declining share of labor in national income do not match the data. As I have shown, consumption as well as wages and salaries have a quite stable rate of growth through the business cycle and, particularly, immediately before recessions. Statistical models in which investment is a lagged function of profits show that the change in present investment is strongly dependent on the change in past profits, so that increasing profits are followed several quarters later by increasing investment and, symmetrically, falling profits are followed a few quarters later by falling investment. The statistical evidence in favor of these patterns is strong, and Granger-causality tests also support causation from profits to investment. In the other potential direction of causation, models in which profits are a lagged function of investment show a negative effect, so that an increase in the rate of growth of investment tends to be followed by a decrease in profits and, symmetrically, a decline in the rate of growth of investment tends to be followed by an increase in profits. The evidence provided by regression models and Granger-causality tests in support of this negative causality from investment to profits is weaker than the evidence that changes in profits are followed by changes in investment in the same direction, but it is still considerable. Overall I interpret all this as meaning (1) that there is strong evidence for a positive causal link between past profits and present investment; (2) that weaker evidence supports a negative causal link between past investment and present profits; and (3) that quarterly data are noisier than annual data, so that the identification of the signal is more difficult, which maybe the reason why the negative effect of investment on profits only appears significant in the annual analysis.

To summarize the implications of the empirical analyses presented in the former section, it could be said that the profit-squeeze scheme (high wages leading to low profits, this in turn leading to falling investment and recession), the underconsumptionist theory (low wages leading to low consumption, this in turn leading to low profits and low investment), and the Keynesian exogeneity of investment (as prime mover of the economy, determined by psychological factors and not by other economic variables) are hypotheses that do not have empirical support. The results of tests for

Granger causality and of regression models, and the leads and lags apparent in the data are inconsistent with these three hypotheses. Furthermore, the likelihood of these three hypotheses is reduced by the fact that profits are more volatile than investment, and investment is more volatile than wages. But under the hypotheses of profit squeeze, underconsumption, or exogenous investment, the movements in profits are caused by movements in another variable. For the movement of a more volatile variable causing the dampened movement of a more stable one, friction in the transmission is an easy explanation. However, for the movement of a more volatile variable being caused by the movements of a more stable one, some magnification mechanism should exist. What this mechanism might be, it is not easy to figure out. But, of course, unknown factors can always be claimed as explanations; we are all prone to look for them when we dislike a simpler explanation consistent with the observed facts and the known variables. However, the principle of parsimony (Occam's razor) favors the simplest explanation (Pearl 2000, p. 45).

A bidirectional causal relation between profits and investment, with both effects having different signs, is consistent with the fact that there are oscillations of both variables, as in a predator-prey model in which, for instance, investment represents wolves and profits represent rabbits. An increasing number of rabbits (rising profits) raises the number of wolves (rising investment), which in turn reduces the number of rabbits (falling profits), so that the number of wolves declines (falling investment) and that of rabbits increases again (rising profits), starting a new cycle.

Positive effects in both directions would imply a circle of positive feedback and absolute instability, leading to explosive growth of both variables. Such bidirectional causation of profits–investment, with different signs in each direction, provides some stability to the economy, though it is just a relative stability at the cost of recurrent periods of economic disarray in which a strong drop in investment restarts the growth of profits. Thus crises appear as Marx saw them: as temporary circumstances restoring, for a while, the normal conditions for the accumulation of capital, which, in turn, will lead to another crisis. Rising unemployment during crises reduces wages and favors the deterioration of work conditions, thus facilitating the increase in the rate of exploitation. At the same time, crises destroy thousands of small business and may also slash savings, all of which raises misery for large sections of the population. But they open the door to a new wave of expansion, in which different kinds of misery are generated. Mass unemployment and low wages are the consequences of crisis and economic stagnation; escalating

social inequality and a faster destruction of the environment are the consequences of a booming economy (Tapia et al. 2013; Tanuro 2014).

In the Keynesian-Kaleckian tradition, investment and government expenditure are the key variables to explain the economy; as Minsky said, they "call the tune." In this view, with appropriate investment the economy will prosper. As Matthews put it, with entrepreneurs screwing themselves up to do enough investment, profits would eventually rise. This is as if entrepreneurs and owners of money in general were able, like Baron Munchausen, to pull themselves up by their bootstraps. In a sense, if this were true, supply—in the form of investment—would create its own demand, and Say's law, supposedly tossed out the door by Keynes and his followers, would come back in through the window. At any rate, data show that increasing investment is followed by falling profits, so the reasoning of Matthews is faulty. Entrepreneurs "screwing themselves up" to do enough investment would just lead to the usual outcome: decreasing profits and a recession.

A further consideration is that in the Keynesian-Kaleckian scheme, fluctuations of the economy occur because entrepreneurs change the level of investment due to psychological factors outside of the economic realm. Were it not for rich people's whims determining investment, and ruling political forces determining government spending, there would be no recessions. Then the Keynesian-Kaleckian perspective looks like an exogenous theory of the cycle.[8]

Whatever the endogenous or exogenous character of the business-cycle theory of the Keynesian school, what is clear is that a basic component of that theory, the *positive* dependence of profits on investment, is inconsistent with the data, which contrarily show substantial evidence of a *negative* causal dependence of present profits on past investment, as well as very strong evidence of a *positive* causal dependence of investment on past profits. Furthermore Keynes himself said that it is usual in a complex system to regard "as the *causa causans* that factor which is most prone to sudden and wide fluctuation" (Keynes 1937). But profits are precisely the most volatile macroeconomic variable. With strong statistical evidence showing a strong determination of investment by profits, and two centuries of philosophizing and actual business practice demonstrating that money profits are the engine of the free market system, is not all that sufficient to consider profits as the determinant factor, the *causa causans* of the business cycle?

Significant hoards of money pile up during recessions (Wilson 2009; Dash and Schwartz 2011). This issue has not been examined in this chapter, but macroeconomists are aware that "money" leads economic growth; that is, it can be proved by statistical procedures that the mass of money as defined in specific ways tends to start growing before investment and consumption start growing during the expansion. Indeed that regularity observed in the data of the US economy was used by Milton Friedman to elaborate a theory of the business cycle in which money is the leading factor explaining the business cycle. This is the essence of monetarism that has extended its influence to almost all schools of economics and supposedly provides a technique for dampening or eliminating the business cycle by keeping steady the growth of money. But economists following the monetarist theory are oblivious to the fact that the conversion of money hoards into revenue-producing investment is a key element for getting the economy out of a slump. For the mobilization of money hoards into investment, the rise in profitability is the key issue, not monetary policy or low interest rates. At least in passing, it can be said here that the explanatory power of money in statistical regressions in which economic growth is the dependent variable is null when the model is computed with data for recent decades; it also disappears when other variables are included in the model.

To conclude this discussion of theories and facts on the variables determining the dynamic conditions of the economy, it may be worth citing the views of Howard Sherman, who, after publishing many interesting contributions on macroeconomic dynamics, presented in 2010 a theory of the business cycle that, pretending to be progressive, is purely incoherent. Sherman asserts that the macroeconomic theory that is currently dominant is incorrect and shall be replaced by a complete theory whose foundations were laid by Keynes and the post-Keynesian Mitchell, by the institutionalists, and by Kalecki and the radical or neo-Marxist tradition. This attempt to put together Kalecki, Mitchell, Keynes, and Marx would generate a highly incoherent theory that could only be a poor substitute for mainstream macroeconomics. Unfortunately Sherman's views are paradigmatic of what is often presented as progressive or even radical economics.

8. Concluding Remarks

In 1873 Marx wrote to Friedrich Engels that he had been "racking his brains" for some time about analyzing "those graphs in which the

movements of prices, discount rates, etc., etc., over the year, etc., are shown in rising and falling zigzags." Marx thought that by studying those curves he "might be able to determine mathematically the principal laws governing crises." But he had talked about it with his mathematical consultant, Samuel Moore, who had the opinion that "it cannot be done at present." Marx resolved "to give it up *for the time being"* (Marx and Engels 1966, p. 82).

The available "graphs" to be analyzed and the statistical methods to analyze them have improved very much since Marx was racking his brains. This chapter has presented evidence showing that the recessions of the US economy as dated by mainstream economics have essentially the characteristics of economic crises as Marx conceptualized them. These recessions, depressions, or crises are characterized by an interruption of the accumulation of capital, which in national statistics appears as a drop in private investment. As Marx thought, crises appear when profits start contracting, such that the valorization becomes difficult for the social capital at large and impossible for many individual capitals. Thus recessions are preceded by a drop in profits several quarters before, but profits recover in the last quarters of the recession and quickly rise immediately after. The fall of investment during the recession follows the fall of profits, and investment recovers during the expansions following the upturns in profits. During the recession, labor income falls and the total amount of capital is reduced by cancellation of debts, destruction of inventories of perishable commodities, liquidation of other inventories at firesale prices, general devaluation of capital assets, and so forth—all of which often leads to an associated financial crisis. All this is consistent with Marx's view of economic crises as momentary interruptions of the accumulation of capital. By reducing the total amount of capital and increasing the rate of exploitation, recessions allow for the recovery of profitability. I have shown data on many of these processes, though others —like the financial crises and the destruction of capital associated with recessions—are outside of the scope of this chapter.

Elsewhere I have argued that the NBER recessions of the past half century—that is, those dated 1973–75, 1980–82, 1990–91, 2001, and 2007– 2009—are actually the manifestations in the United Stated of five general crises of the world economy (Tapia 2014). The recent IMF book by Kose and Terrones (*Collapse and Revival*, 2015) provides abundant evidence to date global recessions in the years 1975, 1982, 1991, and 2009. However, by using a scholastic procedure to date the recessions, Kose and Terrones reject the existence of a worldwide crisis at the turn of

the century, and they say that the global economy experienced two separated downturns in 1998 and 2001 that "fall short of qualifying as a global recession" (Kose and Terrones 2015, p. 99).

The role of profitability as the major determinant of investment was statistically shown by Tinbergen already in 1939 and then "rediscovered" much later by other authors (Bhaskar and Glyn 1995; Blanchard et al. 1993). Several investigators have concluded in recent years that the United States is a profit-led economy (Barbosa-Filho and Taylor 2006; Rada and Taylor 2006; Mohun and Veneziani 2008), which amounts more or less to the same. All that is consistent with the results presented in this chapter. As mentioned above, Mitchell had described already in 1913 the decline of enterprise earnings—what he described as the encroachment of profits by costs—as a late-prosperity phenomenon leading to recession. However, Tinbergen was the first who used statistical procedures to show more formally a relation between profits and investment that could be conceptualized as a causal effect (Tinbergen 1939; 1950; 1952). This result was unsound according to the high priests of the economic science. It was trashed by Keynes and Friedman, and many joined the chorus. Richard Goodwin, usually considered a major theorist of business cycles, joined the critical clique, saying that "if we reverse the direction of causality and say that investment determines profits through the multiplier and income, we rob one of Tinbergen's chief results of much of its significance." For Goodwin this could be done because in business cycles "most things go up and down together, and hence the danger of spurious correlation is very great" (Goodwin 1964, p. 433).

Goodwin's critical comments against Tinbergen are based on faulty reasoning, as spurious correlations take place when series trend up together or trend down together, or trend in opposite directions—not when they oscillate following each other or mirroring each other repeatedly. For instance, both at the level of national economies and the global economy, CO_2 emissions and economic activity go up and down together, and this does not represent a spurious correlation but a causal link (Tapia et al. 2012). Certainly, as Goodwin said, many things swing up and down "together" in the business cycle, but observed lags and statistical analysis can be exploited to provide evidence on which signs and directions of causation have empirical support. The evidence presented in this chapter is strongly at odds with the views of the Keynesian school of which Richard Goodwin was an outstanding member. The evidence, however, is strong in favor of an endogenous theory of the business cycle in which profitability

has the leading role. From the point of view of such a theory of economic crises that seems supported by solid theoretical considerations as well as empirical data, data of recent years suggest it is very likely there will be a new recession in the global economy (Tapia 2016b).

Both mainstream economists and radical authors often maintain that different economic crises have different causes, and that it is therefore nonsensical to look for common patterns or common explanations (Mankiw 2009; 2010; Duménil and Lévy 2011; Harvey 2011, pp. 213–24). Robert Lucas, probably the most typical representative of classical views in macroeconomics, declared in 2012 that he had changed his ideas on how important "financial shocks" and "real shocks" are in each recession since the 1930s to the present. "Of course, this means I have to renounce the view that business cycles are all alike!" (cited in Kose and Terrones 2015, p. 172). Now, in pure or applied science it is a well-accepted principle that when studying the causes that determine a phenomenon (let's think about earthquakes, tides, the yield point of a material, lung cancer, or puerperal fever), rather than looking for the particularities that always exist in a specific case or a particular experiment, the proper strategy is to examine multiple occurrences of the phenomenon and from that multiplicity to try to grasp its essential features and determinants. But in present-day economics, to look for common patterns of economic crises is rather a rarity. Interestingly, the tendency to think that each crisis is different coexists in economics with an ahistorical approach that assumes that business cycles—like markets, credits, and capital—have existed forever, so that any kind of economic disturbance, even one that happened many centuries ago, is to be included when the purpose is to study economic crises (Reinhart and Rogoff 2009).

In the field of heterodox economics, crises are often conceptualized as long periods of stagnation. For most radical economists and commentators, American capitalism only has had two crises after the Second World War: the one that took place more or less in the 1970s–1980s, and the worldwide crisis that started in 2007. This point of view implies that the business-cycle recessions of the United States dated by the NBER in 1991 and 2001, or the global recession identified by IMF authors in 1991 are not economic crises in any sense. For instance Shaikh (2016, p. 733) refers to 1982–2007 as a boom period of the US economy. Interestingly the idea of a period of "Great Moderation," with steady economic growth, was advanced in mainstream economics precisely for those years. But how can 1982–2007 be a boom period when IMF authors refer to a worldwide recession at the start of the 1990s and in US economic data all the typical

elements of a crisis are present? There was a major contraction of profits, followed by falling investment and wages and rising unemployment (table 3.1). The same applies to 2000–2001.[9]

Contrasting with the view of radical economists who see only two crises of capitalism after the Second World War—one in the 1970s–1980s and other starting in 2008—is the notion of historians working in the context of world-systems theory, who claim that economic crises may last more than a century (Arrighi 2003, pp. 527–39; Wallerstein 2001, p. 23; 2011). The Marxologist geographer David Harvey (2014) believes that crises in capitalism are never solved, but they are just moved around. In the view of all these authors, capitalism has been in a kind of permanent crisis for quite a while, perhaps since the time—one century ago—when Lenin claimed that imperialism was the highest and final stage of capitalism.[10]

To maintain these views implies an extreme unwillingness to use the available data that, with all their imperfections, provide the only possible insight into the real world of economic phenomena. Data from multiple sources show, for instance, that the global economy had a crisis in the early 1990s and then a strong expansion in the following years, only to return to crisis conditions around the end of the century.

To develop scientific knowledge is to advance concepts that are useful to describe reality, to make testable predictions, and to be ready to assess any hypothesis by contrasting it with empirical data. Economic crises lasting decades or centuries, or just being "moved around," are no less fantastic than the "Great Moderation" of mainstream economics, or a 25-year expansion of the US economy between 1982 and 2007. Phlogiston did not have a place in chemistry, and economic crises of a fuzzy character shall not have a place in social science.

Parts of this chapter were previously published in 2013 as "Does Investment Call the Tune? Empirical Evidence and Endogenous Theories of the Business Cycle," in Research in Political Economy, *vol. 28, pp. 229–59.*

Notes

1 References in which these disagreements can be found are Duménil and Lévy (2011), Roberts (2009), Mattick Jr. (2008), Harvey (2011), Kliman (2012), Heinrich (2013), and Carchedi and Roberts (2016). Anwar Shaikh's entry on "economic crises" in Bottomore's *Dictionary of Marxist Thought* has interesting material on modern interpretations of Marx's theory, but not much about Marx's theory of crisis itself. For those interested in a general review of Marx's

theory of crisis, the best presentations in my view are those of Mattick (1981) and Clarke (1994).

2 I have examined the role of oil in causing downturns of the global economy in Tapia (2016a).

3 For a modern survey of theories of the business cycle, see Knoop (2004). The encyclopedia edited by Glasner and Cooley (1997) is a wealth of information.

4 For the sake of the record, I must say that the Great Recession did not catch me "flat-footed." I had mentioned the possibility of "a major depression that, because of unsustainable processes in the world economy, may appear at any moment as a world crash" in my book review of Duncan Foley's *Adam's Fallacy: A Guide to Economic Theology*. I wrote that book review in 2007. It was published in *Challenge*, vol. 51, no. 2 (March 2008), pp. 110–20.

5 *Business Cycles and National Income* (Hansen 1964, first published in 1959), could also lay claim to that distinction.

6 For Marx capital accumulation takes place when money profits are spent in purchasing capital goods (constant capital in Marxian parlance) or paying wages (variable capital) to expand production. In that respect the Marxian concept of capital accumulation is wider than the concept of "investment" in national accounts and mainstream economics, which usually refers to purchase of capital goods.

7 Kalecki pointed out that salaries in national income accounts include both salaries of government officials—which are paid from tax-revenues—and salaries of top-level executives —which should be rather classified as profits (Kalecki 1991, p. 237 n17). That observation is even more relevant nowadays, as profits are increasingly presented as salary compensation for the high-level managers who are often also owners of significant shares of the corporation. Piketty (2014) supplies data that abundantly illustrate this trend. However, these issues will be ignored in this chapter. For the sake of simplicity, it will be assumed here that NIPA "wages and salaries" correspond to labor income.

8 Whether Kalecki has an exogenous or an endogenous theory of the business cycle is not an easy question. The editor of Kalecki's *Collected Works*, Jerzy Osiatynski, says that in Kalecki's *Theory of Economic Dynamics* "the long-run development of the capitalist economy, and even its passage to the phase of the business upswing, *was only possible under the influence of exogenous factors"* (Kalecki 1991, p. 551, emphasis added). This sharply contrasts with assertions by Minsky, who, claiming to follow Kalecki's views on economic dynamics, argued that cycles and crises "are not the result of shocks to the system or of policy errors … they are endogenous" (Minsky 1991).

9 In *Capitalism*, Anwar Shaikh shows his skepticism on the building cycle of fifteen to twenty-five years that was proposed by Kutznets (Shaikh 2016, footnote 26, p. 107), but he maintains the existence of long waves. Consistent with the idea of long waves is Shaikh's chronology of crises (which Shaikh calls great depressions) in the years 1873–94, 1929–39, 1969–82, and 2008– (for this crisis no ending year is given). The evidence for the existence of long waves provided in the book seems to me very weak and unconvincing. Shaikh mentions on page 726 the views of Kondratieff, but he presents his own evidence based on wholesale prices in gold terms, which would show the long waves in the evolution of capitalism. In figure 2.10 of the book, Shaikh presents wholesale prices in gold; in figure 16.1 the same data are presented as deviations from a cubic trend; in figure 17.1 Hodrick-Prescott trends (the smoothing parameter is not indicated) are presented. If all that is useful for anything, it is to support the assertion that wholesale prices in gold have a long-term fluctuation. Why should the basic dynamics of the accumulation of capital be linked with these long waves of prices in gold? On page 197 of *Capitalism*, there are some theoretical considerations on inventories and replacement of fixed capital that perhaps are plausible from a merely theoretical point of view, but they seem rather useless for the purpose of analyzing crises because there is no way to find a correlate for them in economic statistics. Referring to 2008–2011 Shaikh says, apparently surprised, that "it is striking that in the midst of a major global crisis profit rates have risen," attributing it to falling wages but also to governments over the world infusing "staggeringly large sums of newly

created money into the coffers of banks and businesses" (p. 736). That does not seem a good explanation, since the profit data Shaikh is using (apparently NIPA data, though that is not clear as the appendix 6.8.II.7 that is given as data source can be found neither in the book nor online) would not be affected by government actions to save banks. On the other hand, as I have explained in this chapter, for both Marx and Mitchell it is to be expected that profits and profit rates *rise before the crisis ends*, and that is indeed what data show.

10 The case of Mattick Jr. is a special one. His *Business as Usual: The Economic Crisis and the Failure of Capitalism* (Mattick 2011) is a superb presentation, following Marx's views, of the general processes that lead to crisis in capitalism and the particular processes that had a major role in the development of the Great Recession. However, Mattick never provides in the book a chronology for the crisis or crises he is talking about. He does so in an interview (Clegg and Benavav 2011) in which he asserts that the crisis that started in 2008 is just a continuation of the crisis of the 1970s. Thus, in his view capitalism has been in a permanent crisis since many decades ago. As I already mentioned, Marx plainly rejected the view that crises can be permanent (Marx 1968, p. 497). Recurrent crises have a key role in Marx's theory of capitalism. For Schumpeter, crises are like the beat of the heart of capitalism, and Marx probably would have agreed with that metaphor. That capitalism has been in cardiac arrest since the 1970s seems to me quite an optimistic view. I rather think that the beast, though decrepit and rundown, is still alive and kicking.

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