Curtin University

WORKING PAPER SERIES

The Centre for Research in Applied Economics (CRAE)

Prices in Motion: Schumpeter's Contribution to Price Theory

Harry Bloch
Curtin University

Prices in Motion: Schumpeter's Contribution to Price Theory*

Harry Bloch, School of Economics and Finance, Curtin University,
GPO Box U 1987, Perth WA 6845. Email: h.bloch@curtin.edu.au

Preliminary Draft, Not for Quotation

May 14, 2014

Abstract

Schumpeter distinguishes between the circular flow of economic activity and economic development. The former is characterised by equilibrium, while the latter involves discontinuous change that induces business cycles. Schumpeter argues that with development prices are generally in motion. Schumpeter's theory of the business cycle has been heavily criticised. Specific criticisms relating to his price theory include its characterisation of prices stabilising near the Walrasian competitive equilibrium for a stationary economy and its prediction of a downward trend in prices over the longest cycles. This paper reviews Schumpeter's theory and the critiques before suggesting a way forward to a revised theory of prices in motion.

1. Introduction

Schumpeter makes a fundamental contribution to economic theory by distinguishing between the circular flow in a static economy and the process of economic development.

> 'Development in our sense is a distinct phenomenon, entirely foreign to what may be observed in the circular flow or in the tendency to equilibrium. It is spontaneous and discontinuous change in the channels of the flow, disturbance of equilibrium, which forever alters and displaces the equilibrium state previously existing.' (Schumpeter 1934, p.64)

To Schumpeter, endogenous economic development is an essential characteristic of capitalism and, thus, incorporating the disruptive process of development is crucial to the proper analysis of capitalist economies.

Schumpeter notes that innovation introduces a new element into price theory. Price equilibrium in the circular flow is displaced by an analysis of prices in motion. In particular, the entrepreneur who introduces the innovation receives a price that exceeds cost. This entrepreneurial profit then attracts others to the innovation,

> 'the final result must be a new equilibrium position, in which, with the new data, the law of cost rules again…..The incentive to produce more and more products will not cease before this condition is arrived at, nor before the price falls as a result of the growing supply.' (Schumpeter 1934, pp. 131-2)

The diversion of productive inputs from their existing employment by entrepreneurs and the process of creative destruction that accompanies the dissipation of entrepreneurial profit both impact on prices throughout the economy. Expansion of production by the entrepreneur and its imitators push up prices of inputs to production, while the prices charged by the entrepreneur's competitors are pushed down once the extra production from the innovator comes on the market. These ups and downs in prices leave the structure of prices in the economy permanently changed, corresponding to the structural change that innovation brings to production and consumption. In addition, Schumpeter's argues that the net effect of the ups and downs in individual prices is a rise in the aggregate price level in the early years after a wave of innovations, followed by a larger decrease in later years. Thus, innovations impart cyclical movements in the aggregate price level around a long-run downward trend.

In contrast to the general interest in Schumpeter's work on economic development, little attention has been given to his contribution to price theory. In part, this reflects the highly critical reviews given to *Business Cycles* (Schumpeter 1939), which contains the most extensive exposition of his price theory. Integrating discontinuities into a model of equilibrium in a steady state creates inherent difficulties as is noted in various critiques. A particular weakness is that Schumpeter uses the Walrasian equilibrium of the circular flow as determining the normal price

level for an economy undergoing development. Schumpeter argues that prices approach this normal level at the beginning and end of the cycles associated with discontinuous change.

Schumpeter's great insight that understanding capitalist development requires an analysis of prices in motion remains valid, but a corresponding analysis of normal prices is also required. The time has come to reconsider Schumpeter's use of the analysis of the stationary state for the determination normal prices for a developing economy. As Schumpeter explains, there is no economic profit earned in the stationary state and normal price therefore equals the long-run average cost of the resources used up in the production process. The proposition developed in the analysis that follows is that the same can't be said of a developing economy, even at the beginning or end of the business cycle.

The process of creative destruction in a developing economy implies there is a reasonable probability that investments that embody current technology will suffer future losses of value from unforseen technological developments. This creates an option value for resources that are withheld from commitment to investments in productive equipment that embody current technology. Similar option values obtain for any investment that potentially becomes obsolete due to the discontinuous process of technological change, including the skills and intellectual capital embodied in individuals and organisations. If producers in a developing economy are to undertake investments that embody current technology, price needs to cover option values. Thus, normal prices in a developing economy should be sufficient to cover option values.

Option values arising from withholding commitment to investment in current technology might be considered a cost associated with the probability that the equipment, skills or intellectual capital becomes economically obsolete. However, the actual losses associated with creative destruction are only realised ex post, so the cost of commitment is a priori unknown and is not dealt with in accounting practice except after the fact in the form of writing down the value of assets. Whether or not option values are considered to be costs, the inclusion of option values means that normal prices in a developing economy are higher than in a stationary economy with the same technology. Of course, technological developments tend to reduce costs or improve product quality over time, so it is wrong to conclude that the developing economy at rest is in any way inferior to the stationary economy. Indeed, the fundamental difference between a stationary economy and a developing economy means that they require a fundamentally different price (and welfare) theory.

The next section contains a concise exposition of Schumpeter's theory of the price level and price system. Criticisms of his theory are discussed in Section 3 and the implications for the theory of prices in motion are developed in Section 4. Section 5 concludes.

2. Schumpeter's price theory

Entrepreneurial profit, which results when innovation causes a divergence between product price and cost, characterises in all of Schumpeter's examples of innovation (new processes, new products, new markets, new sources of supply of raw materials and new forms of organization) in *The Theory of Economic Development* (Schumpeter, 1934). Importantly, while the profits for an individual entrepreneur are transitory, entrepreneurial profit for the system continues as long as there is economic development. The central role of such profits in the process of economic development differentiates his theoretical structure from mainstream theory.[1]

The theoretical differentiation between development and the circular flow is elaborated into a theory of price in *Business Cycles* (Schumpeter, 1939). Here, Schumpeter addresses the impact of innovations on the "price level" and the "price system" as well as providing detailed discussion of the prices of particular commodities. Most importantly from the perspective of understanding the nature of his price theory as it applies to economic development, he argues that there is a pattern of interrelated movements in prices of particular commodities, the price system and the price level that reflects the evolution of the developing capitalist economy. Thus, the discussion below of Schumpeter's price theory emphasises the analysis contained in *Business Cycles*.

The sub-title of *Business Cycles* is: *A Theoretical, Historical and Statistical Analysis of the Capitalist Process*. Schumpeter clearly intends *Business Cycles* to turn 'the scaffolding into a house, to embody the results of my later work, to present the historical and statistical complement, to expand old horizons.' [Schumpeter 1939, p. v] Old horizons clearly refer to the theoretical framework of *The Theory of Economic Development* and his related articles on the theoretical apparatus used for analysing economic development. Thus, the analysis in *Business Cycles* is properly viewed as providing an elaboration and application of Schumpeter's approach to capitalism, including the elaboration and application of his price theory.

Specific discussion of prices in *Business Cycles* occurs after Schumpeter has set out the basic theoretical framework in the first five chapters of Volume 1 and has surveyed historical developments up to 1913 in the sixth and seventh chapters. Volume 2 begins with Chapter VIII on the price level and then Chapter X deals with prices and quantities of individual commodities. In between, there is a discussion of aggregate output and employment in Chapter IX, and Chapter XI discusses other economic magnitudes (including wages, interest rates and stock prices).

---

[1] Mainstream price theory associates innovation with imperfect competition and monopoly profits, creating a superficial similarity to Schumpeter's theory. However, monopoly profits are consistent with equilibrium in both the short and long run, whereas Schumpeter's theory incorporates entrepreneurial profit only under the conditions of discontinuous change. Importantly, profit disappears from the system in Schumpeter's theory at both the beginning and the end of the business cycle, such that "normal" prices in his system don't include economic profit.

a. The theoretical framework

The analysis in *Business Cycles* adds to Schumpeter's theory of economic development by providing a time dimension to the notion of structural change driven by innovation. Schumpeter argues for a particular pattern of bunching of innovations in time and extensively analyses the working out of the adjustment to these innovations over time. The theoretical analysis of this time dimension is laid out in Chapters III to V, after Chapter II presents a discussion of the characteristics of the circular flow of an economy in the neighbourhood of equilibrium.

In Chapter III, How the Economic System Generates Change, Schumpeter reviews his concept of economic development driven by innovation as set out in *The Theory of Economic Development* and other of his writings that precede *Business Cycles*. The emphasis is on entrepreneurial profit as a result of innovation and the structural change in the economy that ensues from innovation. The analysis includes the time dimension of these changes, which is omitted from the analysis in the earlier writings.

The argument that structural change resulting from innovation leads to cyclical movements in economic magnitudes is contained in Chapter IV, The Contours of Economic Evolution. Here, Schumpeter proceeds by a series of approximations. In the first approximation, the cycle has two phases: prosperity and recession.

Prosperity occurs when entrepreneurs establish their new enterprises competing for resources already employed elsewhere in the economy by established firms. The prosperity continues during the rapid expansion of the entrepreneurial firms, enhanced by imitation of the new products and production processes by new entrants and at least some established firms. However, this expansion has limits.

As the volume of output by the entrepreneurial firm and its imitators continues to expand, the market for these products becomes saturated and prices fall, marking the onset of the recession phase of the cycle. This recession phase is a period of consolidation rather than decline. Output continues to rise as a result of the prior expansion of capacity by entrepreneurial firms and their imitators. It is only profit and price that fall in the manner normally associated with recession (see Schumpeter 1939, pp. 142-3).

Schumpeter's second approximation adds depression and recovery to the two-phase cycle to create a four-phase cycle. The extra phases are a response to excessive expansion following an innovation and are associated with what Schumpeter labels the secondary wave.

> 'but now we shall understand that under pressure of the breakdown in the secondary wave and the bearish anticipation that will be induced by it, our process will generally, although not necessarily, outrun (as a rule, also miss) the

neighbourhood of equilibrium toward which it was heading and enter a new phase, absent in our first approximation…. For this phase we shall reserve the term Depression. But when depression has run its course …., the system starts to feel its way back to a new neighbourhood of equilibrium. This constitutes our fourth phase. We will call it Recovery or Revival. (Schumpeter 1939, p. 149)

While Schumpeter argues that depression and recovery are not necessary to economic development, each of the long cycles examined by Schumpeter in *Business Cycles* is found to have both depression and recovery phases.

The third approximation discussed by Schumpeter considers the existence of overlapping cycles of different durations. Schumpeter identifies three cycle lengths that he finds useful in applying his theory to the historical record; Kitchin cycles lasting a little over three years, Juglar cycles lasting for approximately 9 and a third years and Kondratieff cycles lasting for approximately 56 years.[2] He notes that the timing and amplitude of each of the cycles is subject to variation and that cycles are often disrupted by external factors. The idea of the repetition of disruption leading to wave-like motion is fundamental, while the regularity of the timing pattern is not.

Schumpeter concludes the layout of his theoretical framework in Chapter V, Times Series and Their Normal, in which he discusses the statistical method that he uses in applying his theory to historical data. Here, he notes a distinction of his approach from that of Walrasian analysis. In particular, he states, 'Hence, we may for our purpose, define a historic variable as a variable, the Stochastic Normal of which changes owing to a change in its Theoretical Normal.' (Schumpeter 1939, p.196)

b. The price level

Schumpeter's specific discussion of prices in *Business Cycles* begins at the macro level in Chapter VIII, The Price Level. Here, he first emphasises the holistic nature of his approach, warning that, 'The fact that price-level series are first to be discussed should not be interpreted to mean that we consider them first in either causal or symptomatic importance.' (Schumpeter 1939, p. 449) However, he goes on to note, 'Our analysis, however, leads us to believe that at least the symptomatic value of price movements should be great.' (Schumpeter 1939, p. 450) This apparent contradiction reflects the difficulties that Schumpeter faces in applying his holistic analysis of patterns of change in the process of economic development to individual measures, recognising the discontinuous nature of economic development and the multitude of other factors that impinge on each measure.

---

[2] Schumpeter is careful to note that, 'it cannot be emphasised too strongly that the three-cycle schema does not follow directly from our model – although multiplicity of cycles does – and that approval of it or objection to it does not add to or detract from the value or otherwise of our fundamental idea' (Schumpeter, 1939, pp. 169-170)

Although his analysis is holistic, price movements provide a logical starting point for Schumpeter's discussion of movements in measures of economic activity. By focusing on the price level Schumpeter is able to provide clearer predictions than are possible for individual prices or for many other economic aggregates. In particular, he states:

> 'Expectations from the pure model are so definite as to make it superfluous to elaborate them beyond what has been said in Chap. IV. Price level should rise in prosperity – under the pressure of credit creation, which, under conditions embodied in the pure model, would not be compensated either by an increase in output or by any fall in "velocity" – and fall in the downgrade – under the pressure of autodeflation and of increase in output – *more than it had risen in the preceding prosperity*. (Schumpeter 1939, p. 462, italics in original)

In allowing for the second approximation in his theory, Schumpeter notes, 'But the most important difference made by the second approximation – the substitution for the two-phase of a four-phase cycle – adds the expectation that the price level will go on falling in depression and that this fall should be corrected in recovery.' (Schumpeter 1939, p. 462) Thus, the price level is expected to deviate both above and below the downward result trend over the course of a Kondratieff cycle.

Schumpeter's prediction that prices end the long cycle lower than at the start is a result trend that is generated by the price-reducing impact of innovation in the vicinity of equilibrium. Other influences are recognised as disturbing the expected result trend, but after reviewing the historical evidence Schumpeter states:

> 'We may sum up by saying that the great waves of economic change recorded by history show in the behaviour of the price level, but that the association is so imperfect as to make it highly unreliable for purposes of diagnosis or prognosis. Since existence and adequacy of the disturbances that we hold responsible for that imperfection can in each case be established from independent historical evidence, the fact should not be recorded against our model. Among them, monetary disorders, which in particular account for outstanding peaks, are by far the most important.' (Schumpeter 1939, pp. 472)

Having the result trend remain intact with disturbances implies the absence of sufficient offsetting trend in the disturbances, which as Schumpeter notes include monetary disorders. He goes on to specifically address the argument that the price level is related to gold production (in an era when the major industrial countries still generally pegged their currencies to gold).

> 'It does not follow that the Kondratieff wave in price level is simply due to the variations in gold production. On the contrary, it is clear – since according to that theory price level is the result of variation in monetary gold stocks (which, let us note in passing, are still more of a function of business situations than total gold

stocks) and output of commodities, and since variation in the latter result, in turn, from the working of our process – that whatever the behaviour of gold, unless it should happen to be exactly compensatory, the fingerprints of the Kondratieff must show on the price-level graphs, although more or less blurred by gold production' (Schumpeter 1939, pp. 473)

The suggestion that monetary gold stocks, as opposed to total gold stocks, reflect the working of Schumpeter's process is central to understanding his position that the price level can be expected to show a declining result trend over the long cycle. Essentially, Schumpeter is arguing that the supply of monetary gold is endogenous and subservient to the working of the capitalist process that he is analysing. Schumpeter holds a similar position with respect to the supply of fiat currency in discussing those historical periods where countries have moved away from the gold standard.[3]

c. The price system – prices of individual commodities

Innovation, as the driving force of economic development, impacts on the structure of economic activity in Schumpeter's theory. This implies that there are necessarily changes in relative prices, or in what Schumpeter refers to as the price system. While some aspects of changes in the price system are discussed in Chapter VIII, most of the discussion is postponed to Chapter X, Prices and Quantities of Individual Commodities. Here, Schumpeter deals with the details of the diverse character of price movements across commodities and with their relation to corresponding movements in quantities.

Following on from innovation, the price system changes so that the prices of products where there has been successful innovation fall, in at least quality-adjusted terms, relative to prices of products not undergoing innovation.[4] This change does not occur instantaneously or uniformly according to Schumpeter. As a result, 'The reader should therefore realize from the outset … that expectation from our model is not for uniformity but for what we actually find, great variety of amplitudes, periods, and sequences that does not tell in the least against an all-pervading movement and does not spell theoretical, although it does spell statistical, irregularity.' (Schumpeter 1939, pp. 521-2)

This disclaimer is followed by description of price movements for a range of commodities, each deflated by an aggregate price level measure, which generally show distinct cyclical behaviour, albeit with differing amplitudes, periods and sequences. Schumpeter notes that, 'The moral of the story is that only analysis of the history of the state of an industry will explain the behaviour of its price-quantity pairs.' (Schumpeter 1939, p. 525) Further

---

[3] See, for example, his discussion of the movements of the American price level during the long wave of 1787 to 1842, an era of free banking (see Schumpeter 1939, pp. 292-296).

[4] A potential exception is when the innovation involves the reorganisation of the producers in the market to form a cartel or in some other way to increase market power and raise prices above the cost of production without any improvement in product quality.

complications to potential price-quantity patterns are noted in Schumpeter's discussion of special cases in which there are lags in production, such as coffee, hogs and shipbuilding.

A final section of Chapter X deals with entrepreneurial price policies. Here, Schumpeter focuses heavily on dispelling the popular view that imperfect competition, particularly that arising from innovations, breeds dislocation due to price rigidity. He concludes noting,

> 'Thus, analysis of the nature and sources of the various kinds of price rigidity we observe and of that monopolistic or oligopolistic strategy which, intentionally or nonintentionally, rationally or irrationally, is responsible for some of them, hardly lends support to the ideas many students entertain about their importance or, as some would say, growing importance for the cyclical mechanism, particularly, their dislocating effects on the rest of the system in depression. There is less genuine rigidity, and what there is of it is less dislocating, than is widely assumed. (Schumpeter 1939, p. 543)

Schumpeter clearly argues for the generality of cyclical price movements in innovating commodities.

3. Criticisms

Early criticism of *Business Cycles* occurs in a negative review in the *American Economic Review* by Kuznets (1940). Kuznets focuses primarily on the empirical content, but he also expresses serious doubts about the theoretical foundation for the clustering of innovations and the regularity of business cycles. As Freeman (1990) notes, the timing of publication was not favourable, coming on the eve of World War II and with Keynesianism well as established as the flavour of the day. Not surprisingly, *Business Cycles* languished in relative neglect for many decades. Freeman notes that library borrowings and citations only picked up with the general resurgence of interest in Schumpeter's work from the 1980s onward, particularly with increased interest in long waves of economic growth.

Appearing fifty years after Kuznets (1940), Freeman's (1990) reappraisal of *Business Cycles* is sympathetic to Schumpeter's insight that innovation is associated with disruption of the normal pattern of economic life. However, he is critical of Schumpeter's 'preoccupation with the individual entrepreneur and the individual innovation, and his failure to conceptualize invention, innovation and technology accumulation as a social process.' (Freeman 1990, p. 24) Freeman closes by reviewing some then recent developments in the analysis of long waves of economic development and suggests, 'they do indicate a real possibility of overcoming some of the weaknesses in Schumpeter's pioneering formulation.' (Freeman 1990, p.32)

a. Creative destruction and the theoretical normal of the price system

In comments particularly relevant to assessing Schumpeter's price theory, Freeman suggests that Schumpeter 'had a theory of entrepreneurship without a theory of the firm.' (Freeman 1990, p.26) Further, Freeman notes that, 'Both in *Theory of Economic Development* and in

Business Cycles Schumpeter represents boom as a departure from equilibrium and recession as a return to equilibrium in largely Walrasian terms.' (Freeman 1990, p.27) This means that Schumpeter's price theory relies implicitly on the Walrasian theory and its assumption of static competitive general equilibrium, at least in so far as determining the theoretical normal to which prices converge at the beginning and end of the business cycle.

Oakley (1990) also questions Schumpeter's use of Walrasian equilibrium as the beginning and ending point of the cycle. In referring to the circular-flow equilibrium being re-established after a wave of innovation, Oakley notes that 'It is readily apparent that this fiction, with its new entrepreneurs, new plants, new firms and new credit simply added into Schumpeter's perception of the circular-flow conditions, led him to grossly understate the complexity of the traverses that comprise economic development and the business cycle.' (Oakley 1990, p. 233) Yet, Oakley supports the Schumpeter on the argument that the economy in motion has a centre of gravity, 'It follows that at least in some ill-defined sense, some empirical *centre of gravity* must exist. The extent to which it can be analytically defined and applied must remain a moot point.' (Oakley 1990, p.240)

Anderson (2012) reinforces the aforementioned complaints about *Business Cycles*, noting 'In retrospect, the shortcomings of this book can be traced back to its depiction of macroevolution as a series of circular flows.' (Anderson 2012, p. 636) Anderson points to the need for a theory of microevolutionary processes as the basis for macroevolution. He further suggests that hints about constructing such a theory can be found in Schumpeter's other works, particularly *Capitalism Socialism and Democracy* (Schumpeter 1942).

Schumpeter associates successful entrepreneurship with profit, hence with price exceeding the cost of production. Cost for the entrepreneur may fall with price remaining constant, as in the case of process innovation, or price might rise with cost remaining constant, as can occur with product innovation, or there may be some combination of falling cost and rising price.[5] However, in each case entrepreneurial profit is transitory and dissipates over time with expansion by the entrepreneur, imitation by other new or established firms.

While Schumpeter is clear that dynamic competition leads to dissipation of entrepreneurial profit, he does not fully develop the analysis of the pattern of entrepreneurial behaviour and competitive response that leads to this dissipation. Instead, he maintains the separation where Walrasian theory determines prices that are the theoretical normal towards which the economy gravitates at the beginning and end of cycles, while entrepreneurial behaviour drives prices during the cycle. Implicitly, economic development has no impact on the theoretical normal.

Schumpeter's failure to consider the impact of development on the theoretical normal of prices leaves his analysis incomplete and exposed to attack as noted by Freeman (1990),

---

[5] Even rising costs may occur when the product improves to such an extent that price can be increased by more than the increase in cost, as in the case of new products that better meet the needs of the buyer.

Oakley (1990) and Anderson (2012). Even the conclusion that competition between entrepreneurs and established firms will lead to dissipation of profit cannot be assured. Indeed, in *Capitalism, Socialism and Democracy* Schumpeter (1942) seemingly retreats from the notion that monopoly and monopoly profits are completely eliminated from an economy in equilibrium.

If profits are not dissipated through dynamic competition, the argument that the system returns to the theoretical normal of Walrasian equilibrium is further undermined. Yet, the idea that an environment with prices at some sort of normal level encourages innovation by enhancing the reliability of prediction of entrepreneurial profits is appealing. The question of what sort of prices can play this role and yet be consistent with an ongoing process of economic development is taken up in Section 4 below. First, however, there is discussion of criticisms that focus the Schumpeter's analysis of the role of money and finance in macroevolution.

b. Endogenous money and credit

Warburton (1953) acknowledges Schumpeter's contribution to emphasising that innovations and entrepreneurial activity impart a distinctive cyclical character to the capitalist economy, but suggests that Schumpeter overstates the importance of this mechanism relative to that of external shocks as an influence on business fluctuations. In particular, Warburton argues that the Schumpeterian system should be altered to recognise that business depressions, 'are the consequences of external factors associated with the banking and monetary system – or, more specifically, originate in shocks of monetary disequilibrium (failure to maintain the quantity of the circulating medium or events or actions expected or designed to contract the circulating medium).' (Warburton 1953, p.521) This is no minor amendment, as the endogeneity of the money supply is central to Schumpeter's analysis. Bank creation of money and credit features prominently in explaining the ability of new entrepreneurial firms to initiate an upswing and an accommodating, but not excessive, money supply is central to his conclusion that the result trend for the price level is downward over the full course of the cycle.

The bulk of Schumpeter's (1939) detailed data on prices cover the period from some time into the 1800s through to the 1930s. These data cover at least one full Kondratieff cycle in Schumpeter's scheme, the Kondratieff of railroadisation from 1842 to 1897. They also cover part of the following Kondratieff, including the initial upswing, the recession and the depression. Longer times series, such as those presented by Fischer (1996, p. 4) covering English prices of consumables for the period from 1201 to 1993, show a pattern of price level movements for the 19th and early 20th Century that more or less fits the pattern of Schumpeter's cyclical and trend movements. However, the pattern is not repeated over other possible Kondratieff cycles.

Fischer notes that prices in England were stable to declining throughout the 19th century, aside from an upswing around mid century. Fischer characterises this period as the Victorian equilibrium. He also notes two other long periods in which long-run inflation was absent, the Renaissance equilibrium (1400 – 1480) and the Enlightenment equilibrium (1660 –

1730). Before, after and in between were long periods of sustained inflation, to which Fischer puts the label, price revolutions.

This characterisation of alternating periods of long-term price equilibrium and price revolution is not consistent with Schumpeter's expected pattern of cycle and trend. Fischer (1996, p.9) specifically states, 'It should be understood clearly that movements we are studying are waves – not cycles. To repeat: not cycles, but waves.' The distinction to Fischer (*ibid*) is between cycles that 'are fixed and regular' and waves that 'differ in duration, magnitude, velocity, and momentum.' Fischer's data on price level movements from the 13th Century onwards also provide clear evidence against Schumpeter's theory that the price level has a downward result trend. There are too many price revolutions exhibiting sustained inflation, including the revolution of the 20th Century.

In view of the historical record on inflation, what meaning, if any, can be attached to Schumpeter's theory that the result trend for the price level is downward over the long cycle? Alternatively, is it plausible to follow Warburton (1953) and accept the logic of Schumpeter's arguments for a cyclical impulse while arguing that external shocks, particularly monetary shocks are dominant? These are questions that are addressed in Section 4 after considering the revisions to Schumpeter's theoretical framework and the dynamics of the price system.

4. Moving forward

On the historical record, Schumpeter's prediction of a downward result trend for the price level over the long cycle is clearly invalidated and his schema of smooth cycles around the long-cycle trend is difficult to support (even allowing for disturbing influences). Yet, there is clear support from the data for his argument that capitalist development is unstable and that prices are subject to substantial fluctuations with upswings and downswings lasting a number of years. Also, there are many researchers who see merit in associating this instability, at least in part, with the impact of innovations and resulting bouts of creative destruction. Before addressing the questions raised in the Sections 3a and 3b, two modifications of Schumpeter's theoretical framework are suggested. The first modification is to allow for evolution of the institutions of capitalism that impact on the price level and the price system, while the second is to incorporate an analysis of expectations formation that is consistent with the experience of a developing economy.

a. Modifications to Schumpeter's framework

Schumpeter can be faulted for not following his own insights while addressing the dynamics of the price level in *Business Cycles*. Specifically, he doesn't allow adequately for the evolution of the institutions of capitalism, particularly monetary and financial institutions. Modern commercial banks bear little resemblance to the family-run businesses of Victorian England, while the intermittent use of the gold standard has been displaced by the actions of independent central banks and the International Monetary Fund. Also, the economic role of governments, both domestically and through international organisations, has expanded dramatically.

Schumpeter's neglect of the institutional evolution can be addressed by incorporating a theory of institutional evolution. Alternatively, a more limited approach is to incorporate the specific monetary, financial and government institutions of the time into the analysis of the price level for any historical period. The latter approach is less satisfactory in terms of generality but potentially more manageable. For the modern period, say since the early 1900s, governments and monetary authorities have taken an active role in credit creation and money supply with specific intent of influencing the price level and the dynamics of inflation. In the discussion in Section 4.d below, Schumpeter's theory of the price level is modified to take account of the evolution of the institutions affecting the creation of credit and control of the money supply.

A second modification to Schumpeter's price theory is also suggested in the discussion below. This is the explicit incorporation of expectations formation. Schumpeter recognises the difficulty of forming correct expectations in the process of discontinuous change that accompanies innovation (see Schumpeter 1939, pp.53-55), but only in the downswing of the long cycle are expectations given a clear role in driving the process and, even here, the role is limited. With regard to the adjustments associated with the downswing and the possibility of crisis, he writes,

> 'Then pessimistic expectation may for a time acquire a causal role. But again it is necessary to warn against overstating its importance. The simplest appeal to experience should be sufficient to justify this warning. No great crisis has ever come about that was not fully explainable by the objective facts of the situation. Expectation not so conditioned never has produced more than short-lived spurts or breaks.' (Schumpeter 1939, pp. 148-149)

One can agree with Schumpeter on the secondary role of expectations in leading to crises, but still see a broader role for expectations in price formation.

In particular, expectations are important in determining the theoretical normal for the price of individual commodities. As noted above, the theoretical normal in Schumpeter's theory is the steady-state circular flow in Walrasian equilibrium. These prices are based on expectations of no change occurring in the economy. Prices that incorporate expectations of the long-run experience of an economy undergoing development provide a more plausible "normal". In the discussion below, theoretical normal prices are equal to production costs, as in Schumpeter's analysis, but production costs are based on the expectation of future productivity increases from innovations. These costs are increased by including an allowance for the obsolescence of technology embodied in irreversible investments, which is reflected in the option value of waiting to commit productive resources.

b. A revised theoretical normal for the price system

Schumpeter's begins and ends the business cycle with a theoretical normal for the price system that corresponds to the long-run competitive equilibrium of the circular flow for a stationary economy. There is no economic profit for the individual firm and no return to capital in the system as a whole. The price of each product is equal to both its marginal and its average unit cost. This allows Schumpeter to treat entrepreneurial profit from innovations as the sole source of profit and the driving force behind the macroevolution that leads to the business cycle and long-run growth of productivity.

Suppose the notion of a theoretical normal for the price system with zero economic profit is accepted as the starting point for an economy when all innovations have been fully diffused. The economy at this starting point has experienced innovations and their diffusion, which should be considered the usual circumstance of the economy. Firms can reasonably expect that further innovations will be introduced that will have the general characteristic of increasing productivity through the discontinuous process of creative destruction.[6] How will the costs and, therefore, prices for this developing economy differ from those of Schumpeter's stationary economy?

Production in the modern economy often requires long-lasting inputs that embody technology, for example, machinery used in technology that has fixed proportions with other inputs to produce a given amount of output. Also, labour often has skills specific to the current technology of production, such as training in the operation of the aforementioned machinery. A change in technology can lower the future returns to these inputs if the products of the new technology compete with those of the old technology. A simple example is where the improvement is in process technology and the product of the new technology is identical to that of the old. The returns to inputs used in the old technology must fall relatively to those used in the new technology if the old technology is to remain competitive.

A fall in the expected future returns to owners of the inputs used with embodied technology makes investment in embodying that technology less attractive unless compensated by an increase in current returns. Thus, in a developing economy the current returns to owners of long-lasting inputs with embodied technology can be expected to exceed the returns to the same inputs using the same technology in Schumpeter's stationary economy in equilibrium. In this way, the expected future development of the economy increases costs of production and, with costs equal to price, increases the theoretical normal for prices in the economy.

It may seem surprising that a developing economy would be characterised by a higher cost structure than a stationary economy with the same technology. However, there is an option value to uncommitted productive inputs in the developing economy that is not present in the stationary economy. The option value is lost once these inputs are committed to the

---

[6] Improved productivity in a broad sense is a characteristic of all of Schumpeter's categories of innovation. This is most obvious in the case of process innovations that reduce cost by saving on input requirements. However, any innovation that results in profits gives more value to the buyer than the costs of its production, a situation analogous that for process innovations.

current technology, either through embodiment of the technology in a machine or training of a worker. There is no loss of option value in the stationary economy because there is no expectation that technology will ever change. In this sense, it should not be inferred that the higher costs mean that the developing economy is in any way inferior to the stationary economy.[7]

An established firm in a developing economy will have committed inputs across a range of activities, including production, marketing, distribution, research and internal organisation of the firm. These committed inputs are all subject to loss of value in the event of future innovations. In the case of fixed plant and equipment, extreme loss occurs in the form of obsolescence when the embodied technology becomes more expensive to operate than the cost of replacement with new plant and equipment. Prior to full obsolescence there is erosion of value, as the cost of production with new technology falls relative to that of the old plant and equipment. A similar process occurs with other committed inputs to the extent that they can't be adapted to new technology, such as when the consumer loyalty value of existing products is eroded by product innovations of competitors or when a company's business model is rendered inferior by the development of improved methods.

Accounting methods sometimes recognise the potential loss of value to production equipment through depreciation charges for plant and equipment that exceed the rate of physical deterioration. The expected useful life in these cases is based on the length of time for which the plant and equipment is expected to remain profitable to operate rather than the time at which the plant and equipment wears out. Equivalent accounting treatment is rarely given to inputs committed to marketing, distribution, research or internal organisation, even though the risks to loss of value due to innovations are present in all cases. Instead, expenditures on these inputs are treated as current expenses leading to systemic differences, which can be reflected in the market value of the firm exceeding its book value.[8]

To summarise, a firm operating in a developing economy will face higher unit cost than the equivalent firm operating in a stationary economy with the same technology. Depreciation on inputs that embody potentially obsolete technology should include a premium in the price paid to reflect the loss of option value from having committed to the current technology. These higher costs reflect the prospect of obsolescence faced by any technology in a developing

---

[7] It also needs to be noted that an economy undergoing development has rising productivity, so that the normal condition of the economy is one of cost and price reduction through innovation. Comparison of the current level of cost between the developing economy without economic profit and the stationary economy misses the importance of technical progress to the growth of well-being. Schumpeter makes a related point regarding the growth in output and productivity in a developing economy by stating that, 'In this respect, perfect competition is not only impossible but inferior, and has no title to being set up as a model of ideal efficiency.' (Schumpeter 1942, p.106)

[8] This gap between market value and book value of inputs committed to marketing, research, distribution and internal organisation are sometimes recognised as goodwill in a firm's balance sheet, especially when the inputs are acquired through the merger or acquisition of another firm. In these cases, a write down in goodwill can occur when the expected future income stream is eroded through the competitive impact of innovations.

economy. They are part and parcel of the structural adjustment required by the development process under capitalism.

c. Prices in motion – the revised price system

Having established a theoretical normal for the system of prices for the developing economy at the beginning and end of the business cycle, the next step is to determine how prices move relative to this theoretical norm when the economy is undergoing development, that is, while innovations are being introduced and diffused throughout the economy. As Anderson (2012) notes, Schumpeter lacks a theory of the microevolutionary processes that underlies his theory of macroevolution. Alternatively, as Oakley (1990) notes, Schumpeter understates the complexity of the traverses that comprise economic development and the business cycle. Filling in these gaps can be approached through various models of firm pricing at the micro level and analyses of dynamic competition at the meso level.

Sylos-Labini (1965, 1984) builds on Schumpeter's insights by suggesting a dichotomous model of pricing, with full-cost pricing for firms in the manufacturing and service sectors and competitive pricing for firms in the agriculture and mining sectors.[9] The full-cost price is equal to unit cost, where overhead costs, including items such as advertising, research and administration, are calculated on the basis of normal volume of output. If input prices include the option value of commitment, these full-cost prices correspond to the theoretical normal for prices as suggested above. The competitive price with zero profit would also cover the full cost of inputs including the increased depreciation for potential obsolescence.

In Sylos-Labini's model, full-cost prices for manufacturing are based on the normal level of output so variations in output from the normal level don't lead to price changes even though overhead cost per unit does change. Further, direct costs are assumed invariant to output based on an assumption of constant returns to scale in the short run over the relevant range of output. Thus, Sylos-Labini's theory leads to manufacturing gross profit margins that are constant over the business cycle. However, the model can still generate price cycles due to interaction of the manufacturing and raw materials sectors.

The raw material producing sector is assumed to be competitive, so the introduction of innovations raises the derived demand for raw materials and pushes raw material prices up.[10] These price increases are passed through into manufactured goods prices with the fixed gross profit margin. Wages also rise if there are explicit or implicit cost-of-living adjustments to money wages or if wage rates are sensitive to the increased derived demand for labour. An upward cost-price spiral occurs when the higher wages are passed back into manufactured goods prices. This spiral continues at least until the supply of raw materials eventually increases in response to the higher than theoretically normal prices on offer.

---

[9] Sylos-Labini acknowledges parallels to the dichotomous pricing model developed by Kalecki (1971).

[10] Schumpeter (1939, p.480) in commenting on observed cyclical price movements acknowledges. 'that the producers' goods price composite, although it displays substantially the same rhythm as the consumers' good composite, shows greater amplitudes and generally also some precession.'

The increase in raw material supply exerts some downward pressure on prices, but doesn't fully capture the downswing forces of Schumpeter's schema. In particular, Schumpeter's concept of creative destruction suggests that there is erosion of profit margins as the innovator and its imitators all increase output. However, Schumpeter provides no detailed analysis of the dynamic competition between of the innovator and competitors using the old technology.

In this regard, Steindl's (1976) analysis of absolute concentration at the industry level provides a useful complement to Schumpeter's macro-level discussion of innovation and competition. Steindl posits an industry with heterogeneous costs where the progressive firms with lower unit costs engage in internal accumulation, financing expansion of capacity by reinvesting their retained profits. Only when the rate of capacity expansion exceeds the limit set by the growth of market demand do the low-cost firms engage in aggressive competition to drive high-cost rivals from the industry. This leads to extra downward pressure on prices at the point when growth of output for the industry is at a maximum, resulting in a price recession with high output growth as in Schumpeter's macroevolution. Steindl does caution that the process of aggressive competition may end before prices are driven down to the cost level of the low-cost firm. Firms may recognise their interdependence once the industry is reduced to a few relatively low-cost firms, who then refrain from further expansions of capacity and price reductions.

Metcalfe (2007) presents an alternative model of dynamic competition. Metcalfe adapts Marshall's concept of the representative firm in developing a model of dynamic competition among firms with heterogeneous costs. The representative firm is taken to be the average firm in terms of cost, and industry price is set equal to the costs of the representative firm. Firms with relatively high costs are then unable to cover their costs and exit the industry. As high-cost firms exit, the representative firm is fitter, meaning average cost and price fall. The representative firm eventually approaches best practice and costs move toward uniformity through evolution of the industry, as suggested by the concept of creative destruction.

The upswing and downswing of Schumpeter's primary cycle in the price system are nicely captured by adding dynamics of competition at the industry level from Steindl or Metcalfe to Sylos-Labini's model of dichotomous pricing at the micro level. Prices of manufactured goods rise above the theoretical normal of the full-cost model in the upswing due to rising raw material prices and then fall below the theoretical normal in the downswing as the process of creative destruction drives down profit margins and erodes the value of inputs that have been committed to old technology. Prices move towards the theoretical normal levels for the new technology, which are on average below that of the old technology. Importantly,

along the course of the cycle there is a fall in the average of theoretical normal prices, reflecting the impact of productivity growth on costs.[11]

The depression and recovery phases of Schumpeter's schema can be generated in the revised theory by the combined model of dichotomous pricing and dynamic competition. The lagged supply response of the raw materials sector has a tendency to overshoot the demand growth in the manufacturing sector, resulting in prices for raw materials that fall below their theoretical normal level. These are passed on to manufactured goods prices without requiring a drop in manufacturing gross profit margins below normal levels. Importantly, the cyclical pattern can be expected even when there are monopolistic or oligopolistic elements in the manufacturing sector that keep gross margins constant over the cycle and above the competitive level.[12]

d. Institutional change, exogenous money and price level trends

As discussed above, the data on price movements over the past nine centuries don't fit well with Schumpeter's schema of upswings and downswings over regular Kondratieff cycles of 55-56 years duration. Nor do the data reveal a pattern of downward result trends for the price level over successive cycles. The only Kondratieff that comes close to fitting is the one cycle for which Schumpeter had access to reasonably reliable data, the railroadisation cycle (1842 to 1897). Thus, Schumpeter's theory fails the predictive power test with regard to movements in the aggregate price level. The question is whether Schumpeter's analysis nonetheless provides useful contributions to a reconstructed theory of the price level?

At the most basic level Schumpeter's essential contribution to the theory of the price level is his emphasis on the instability of capitalism. The historical evidence certainly supports the proposition that the price level is unstable. Where Schumpeter was over ambitious, and perhaps inconsistent with his own logic, was in trying to impose a uniform repetitive pattern on this instability. The price level is best understood in terms of dynamics rather than equilibrium. The challenge is to understand the forces driving this motion. Importantly, these are not exclusively, or even primarily, the equilibrating forces of neoclassical theory.

Among the forces identified by Schumpeter as propelling prices in motion is the uneven temporal pattern of innovations in the economy. Schumpeter argues for a regular cyclical pattern to these innovations, subject to external disturbances of war, drought and other non-economic events. Others, such as Mensch (1975), Tylecote (1992), Freeman and Louçã (2001)

---

[11] Many innovations, especially new products, disrupt an existing industry structure and lead to a process of creative destruction in which a new industry displaces an old, for example, motor vehicles displacing carriages. In this case, the dynamic competition is best understood as occurring at the meso level (see Dopfer, at al (2004).

[12] Sylos-Labini (1962, p. 148) argues that increased industrial concentration has dulled the pressure of dynamic competition so that, 'Some of the characteristics of the cycle which Schumpeter analysed and which I have recalled in extremely brief form do not exist today.' In particular, Sylos-Labini (1962, p. 150) claims that, 'In the highly concentrated industries recession is no longer accompanied by a price drop'. This argument overlooks the impact of the business cycle on raw materials prices, which have a strong pro-cyclical movement.

and Lipsey, et al (2005), argue for irregular long waves of development resulting from the bunching of innovations, generally associated with breakthrough technologies. However, none of the long-wave theorists contradicts Schumpeter's expectation of a pulse in the price level from the bunching of innovations, with an inflationary impact during the early years followed by a deflationary impact as the innovations mature and attract imitators. Uneven development implies ups and downs in the price level in all these approaches.

Schumpeter also receives support for emphasising the overall deflationary impact of innovation. Indeed, modern discussions on improving national competitiveness centre on productivity improvements as the way to reduce product prices without lowering wages and the living standards of workers. The revised theory discussed in the previous section generates a cycle for the price system with a downward tendency reflecting the influence of productivity growth. However, this theory doesn't take into account macro influences on the dynamics of the cost-price spiral that reflect the working of the monetary and financial system.

Systemic changes in the world monetary system have undermined Schumpeter's position on the endogeneity of money and credit. The level of liquidity available in the world economy is no longer determined solely by the profit-seeking behaviour of private banks. Central banks in the major industrial countries have taken an increasingly interventionist position in money markets, and creation of the International Monetary Fund in the aftermath of the Second World War has enabled coordinated control of liquidity.[13]

Developments in monetary institutions and monetary policy have made Schumpeter's treatment of the supply of money and credit untenable, thereby undermining his theory of the price level. Resurrection of this theory would depend on the analysis of the interaction between the monetary mechanism (institutions and authorities) and. the real economy. Of course, the evolution of the institutions of capitalist economies would not surprise Schumpeter. His holistic analysis encompasses institutional change as part of economic development.

Absent the evolution of the monetary institutions, the reasoning behind Schumpeter's result trend of a falling price level receives some support for the period since the collapse of the Bretton Woods system of fixed exchange rates. Schumpeter based his analysis on a monetary system that was at least loosely tied to the gold standard. While price levels in terms of domestic currency have risen sharply since in the early 1970s in all countries, gold prices have risen even more sharply. As a result, the aggregate price of consumption goods has dropped in terms of gold.

5. Conclusions

---

[13] These changes had begun before the writing of *Business Cycles* and are recognised by Schumpeter, particularly in his discussion of the reaction to the economic crisis of the 1930s by the Bank of England and the US Federal Reserve Bank. However, central bank intervention at the time was focussed on dealing with financial crises rather than guiding the long-run development of the economy (Schumpeter, 1939, pp. 88-904).

Schumpeter provides a theory of economic development that contains within it a theory of both the price level and the price system under conditions of discontinuous change associated with innovation. Schumpeter takes the Walrasian theory of prices in general equilibrium as the starting and end point for the process of economic development, but he then clearly distinguishes the price theory that applies during the process of development. In particular, instead of prices that gravitate towards equilibrium when the economic system is shocked from outside, Schumpeter argues for an endogenous process of development that permanently disturbs the price system from within as well as generating a long cycle in the price level. Schumpeter provides a theory of prices in motion rather than a theory of equilibrium prices.

Schumpeter's theory has been justly criticised on both theoretical and empirical grounds. In particular, an economy that has undergone development is a fundamentally different than an economy in a stationary state, even if the development process is temporarily subdued or suspended. The expectation of change remains and affects investment decisions. Thus, it is argued that position of inflection between the digestion of one wave of development and the beginning of the next can't logically be the Walrasian equilibrium associated with a continually repeating circular flow. Further, it is argued that Schumpeter's theory is a theory of macroevolution, without the supporting analysis of the micro-level behaviour of firms or of the meso-level process of dynamic competition within or across industries.

These criticisms are addressed by sketching a theory of prices in motion that is revised in two main dimensions. First, Schumpeter's theoretical normal for the price system based on the Walrasian competitive equilibrium of the circular flow of a stationary economy is replaced by a theoretical normal based on expectations that are appropriate for a developing economy. A key difference is that costs are increased by the premium in depreciation of inputs committed to the current technology. The premium in depreciation covers the reduced value of inputs that could be employed more productively with a new technology once it is introduced. Thus, the theoretical normal for price in the revised system is higher than in Schumpeter's stationary state, with the degree of price elevation increasing with the dependence on the use of inputs committed to the current technology. The embodiment of technology comes at a cost.

Second, Schumpeter's theory is revised to add an analysis of the microevolutionary process of dynamic competition. A model of firm behaviour based on Sylos-Labini (1962, 1984) is suggested, which recognises dichotomous pricing behaviour, with manufacturing prices equal to full unit cost at normal output levels and raw material prices determined by short-run competitive equilibrium. Added to this is a model of industry evolution through dynamic competition from either Steindl (1976) or Metcalfe (2007) to generate gross profit margins that rise with innovation and fall with the process of creative of destruction. The combination of either of these models with the theoretical normal of a developing economy generates a price cycle with Schumpeterian characteristics following a burst of innovations. Further, the innovations impart a downward tendency to the price system due to productivity improvement over the course of the price cycle.

It is further noted that the systemic inflation in modern industrialised countries during the whole of the 20th Century contradicts Schumpeter's prediction that the price level ends at a lower level at the end of each long cycle than at the beginning. Here, Schumpeter's theory depends on the money supply and credit creation being adaptive to the process of economic development. This is clearly not the case with modern monetary institutions and policy. Thus, an analysis of the evolution of monetary and financial institutions is needed to complete the revision of Schumpeter's theory.

No attempt is provided here to provide an analysis of the evolution of monetary and financial institutions. Also, left out of consideration are the evolution of income distribution and its implications for aggregate demand over the business cycle. Both are needed to have a holistic framework for understanding the implications for capitalist economies of the uneven introduction of innovations. Yet, it is hoped that the revised theory presented here for prices in motion, which reflect the process of development, can assist in filling out this framework.

Schumpeter's great insight is that the capitalist system is continually subjected to discontinuous change due to innovation. While his price theory is undeniably flawed, at least it is aimed at the correct problem of analysing pricing in a capitalist system undergoing economic development. Arguably, the fundamental problems of modern industrial economies are not scarcity and allocation as claimed by introductory texts in mainstream economics, but rather dealing with the instability introduced by innovations that, if properly managed, bring improved productivity and a higher standard of living. As Schumpeter (1928, p. 383) states in a precursor analysis to that of *Business Cycles*,

> 'Summing up the argument and applying it to the subject at hand, we see that there is, indeed, one element in the capitalist process, embodied in the type and function of the entrepreneur, which will, *by its mere working and from within* – in the absence of all outside impulses or disturbances and even of "growth" – destroy any equilibrium that may have established itself or be in the process of being established; that the action of that element is not amenable to description by means of infinitesimal steps; and that it produces the cyclical "waves" which are essentially the form "progress" takes in competitive capitalism and could be discovered by the theory of it, if we did not know of them by experience.

What remains to be fully developed is the theory of this element of the capitalist process, a theory of innovation and the resulting evolution of the economy including prices, quantities and supporting institutions.

References

Anderson, Esben Sloth (2012), 'Schumpeter's Core Works Revisited – Resolved Problems and Remaining Challenges', *Journal of Evolutionary Economics*, 22: 627-648.

Dopfer, Kurt, Foster, John and Potts, Jason (2004), 'Micro-Meso-Macro', *Journal of Evolutionary Economics*, 14: 263-280.

Fischer, David Hackett (1996), *The Great Wave: Price Revolutions and the Rhythm of History*, Oxford, Oxford University Press.

Freeman, Christopher (1990), 'Schumpeter's *Business Cycles* Revisited' in A Heertje and M Perlman, *Evolving Technology and Market Structure*, Ann Arbor, University of Michigan Press, 17-38.

Freeman, Christopher and Louçã, Francisco (2001), *As Time Goes By*, Oxford, Oxford University Press.

Kalecki, Michal (1971), *Selected Essays on the Dynamics of the Capitalist Economy 1933 – 1970*, Cambridge, Cambridge University Press.

Kuznets, Simon (1940), 'Schumpeter's *Business Cycles*', *American Economic Review*, 30: 257-71.

Lipsey, Richard G., Carlaw, Kenneth I. and Bekar, Clifford T. (2005), *Economic Transformations*, Oxford, Oxford University Press.

Mensch, Gerhard (1979), *Stalemate in Technology*, Cambridge, MA, Ballinger.

Metcalfe, J. Stanley (2007), 'Alfred Marshall's Mecca: Reconciling the Theories of Value and Development', *Economic Record*, 83: S1-22.

Oakley, Allen (1990), *Schumpeter's Theory of Capitalist Motion: A Critical Exposition and Reassessment*, Aldershot, Hants, Edward Elgar Publishing.

Schumpeter, Joseph A. (1928), 'The Instability of Capitalism', *Economic Journal*, 38, 361-386.

Schumpeter, Joseph A. (1934), *The Theory of Economic Development* (translation of second German edition by Redvers Opie), Cambridge, MA, Harvard University.

Schumpeter, Joseph A. (1939), *Business Cycles, Volumes 1 and 2*, New York, McGraw-Hill.

Schumpeter, Joseph A. (1942), *Capitalism, Socialism and Democracy*, New York, Harper.

Steindl, Josef (1976), *Maturity and Stagnation in American Capitalism*, New York, Monthly Review Press.

Sylos-Labini, Paolo (1962), *Oligopoly and Technical Progress*, Cambridge, MA, Harvard University Press.

Sylos-Labini, Paolo (1984), *The Forces of Economic Growth and Decline*, Cambridge, MA, MIT Press.

Tylecote, Adnrew (1992), *The Long Wave in the World Economy*, London, Routledge.

Warburton, Clark (1953), 'Money and Business Fluctuations in the Schumpeterian System', *Journal of Political Economy*, 61: 509-522.

CRAE forms a collaborative applied economic research framework across Curtin University. By developing and enhancing new and existing research networks, it provides facilities for sharing research materials and data. CRAE also supports ongoing applied economic research activities relevant to the dynamic economic conditions of the local, regional, national and international concerns of our members through inter- and intra-disciplinary research.