Orthodox economics in a non-orthodox world: developing Keynes’ business cycle analysis

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**Abstract**

Orthodox economic theory fails to recognise fundamental driving forces of business cycles, and this theory is therefore insufficient as a guide in the pursuit of economic stability. This paper claims that Keynes’ “supply and demand price” analysis of employment determination offers a more realistic alternative. Two essential points are emphasised, namely that a) Keynes’ “supply price” can be understood in terms of minimum required revenues for a given profit maximising level of employment, corresponding to a growth rate of employment equal to zero (Keynes’ “effective demand”), and b) it is necessary to include liquidity preference explicitly in the analysis in order to obtain adjustment for uncertainty. The analysis also discusses why booms and busts appear to be persistent, and assesses the relationship between financial markets and economic instability. An implication is stronger regulations of financial markets and a reduction of the size of financial markets relative to the real economy.

**Keywords:** Conventional expectations, rational expectations, shifting equilibrium, supply and demand prices, orthodox economic theory.

**2000 MSC:** D01, D84, E12, E24, E32

1. Introduction

Keynes’ “General Theory” [cf. Keynes (1973a), hereafter GT] has yet not become the theoretical revolution he hoped it would be. His business cycle theory, represented by *the theory of effective demand*, has never been properly incorporated into the dominating “orthodox theory” of classical origin. Orthodoxy consists of several ”dialects”. Even though proponents of each
dialect might claim that their view is substantially different from the other, there are certain unifying elements. These are primarily related to the microeconomic assumptions - which Keynes rejected - that supply and demand from rational, utility maximising agents generate a stable full employment equilibrium in free markets (i.e. the "invisible hand" mechanism). "Rational" in this context seems to mean that agents know the "true" economic model. This model can be described by stable probability distributions of real macroeconomic outcomes - in modern orthodox macroeconomic parlance described by the DSGE model\(^\text{1}\) - with certain long term means (mathematical expectations) and variances. Economic policy (fiscal, monetary) has no long run effect on the natural expected values of real economic variables, such as unemployment and production. It is thus actually implied that objective probability distributions exist independently of the agents participating in the economy. The argument in this paper is that stable ex ante probability distributions - in which nature has given various outcomes different fixed weights - cannot exist independently of human behaviour, but should be understood in terms of agents’ ex ante beliefs and risk assessments, being the underlying driving forces of realised outcomes. As such they are transient and elusive, subject to the same mechanism which governs sentiments, producing state dependent ex ante probability distributions with varying means and variances. A description of this mechanism and how it may generate state dependent deterministic trends in economic variables is the primary aim of this paper.

The orthodox Rational Expectations solution to the DSGE model is derived under assumptions that rule out excessive debt accumulation, "bubble effects" and defaults (cf. the "transversality condition" in the infinite horizon dynamic optimisation problem\(^\text{2}\)). Under such assumptions the DSGE model can be written as a structural vector autoregressive model (SVAR), which is today the main central bank tool for analysis of effects of economic policy. In the SVAR model, regression residuals are manipulated in accordance with orthodox axioms (for example "money neutrality") and then interpreted as "structural shocks" with causal effects. The analysis proceeds by what is called "impulse-response analysis", purporting to measure how long time it

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\(^\text{1}\)The Dynamic Stochastic General Equilibrium model (DSGE), which models the solution to intertemporal optimisation problems by households and firms.

\(^\text{2}\)The famous "in the long run we are all dead" quote of Keynes fits perfectly as a description of the irrelevance of the transversality condition for economic analysis.
takes for the economy to reach the unique equilibrium value again after hav-

ing been hit by such a "structural shock" (for example an interest rate shock).

It follows that a structural shock, the way it is defined, depends on model

specification, since changing the information set of the VAR model changes

the residuals. Therefore this method can not be said to be objective, and

hence not in accordance with basic scientific requirements.

Differences within orthodoxy relates, basically, to some disagreement of

how long time it takes for the economy to reach the unique "natural, gen-

eral equilibrium unemployment rate" after having been hit by an exogenous

shock. Adverse macroeconomic outcomes then become exogenous, indepen-
dent and rare incidents in the left tail of unique, stable distributions\(^3\). In

this respect the "New Keynesian" version of orthodoxy represents a minor

adjustment (relative to New Classical theory), arguing that there is room for

government interference "in the short run" since price rigidities\(^4\) and imper-
fec competition prevent markets from clearing instantaneously. Therefore

active policy may shorten the time it takes for equilibrium to be restored.

Consequently New-Keynesians accept government action (fiscal or monetary)
during economic crises.

The theoretical unification, orthodoxy, is reflected in certain unified views\(^5\)
regarding social organisation, such as deregulation (efficient market theory),
promotion of privatisation with "small government" and downgrading of fis-
cal policy (Friedman’s minimalist state and Ricardian equivalence theory),
the shareholder-value model (if firms maximise shareholder value this leads
to maximisation of wealth in society, cf. the allocative efficiency of stock
markets), promotion of stock markets (because liquid stock markets con-
tribute to efficient resource allocation and promotes capital accumulation in
efficient markets\(^6\)) and the creation of exotic financial instruments (because

\(^3\)The JP Morgan "Value at Risk" method used by financial institutions to calculate
market risk capital requirements, in accordance with international banking regulations
(the Basel II recommendations), is built around the same assumption. This method has
been shown to possess procyclical properties in that capital requirements fall during good
times (increasing fragility) and rise during crises (amplifying a downturn).

\(^4\)Price and wage rigidities are discussed in section 6.3.

\(^5\)See also Palley (2012) and Davidson (2008) for recent thorough analyses of funda-
mental differences between orthodoxy and the economics of Keynes. My understanding
has been greatly enhanced by their writings.

\(^6\)Markets are always right due to the Fundamental Theorem of Finance, the "no arbi-
trage condition". I will return to this theorem below.
these promote liquidity and risk sharing) distributed via a "shadow banking system" (outside the regulatory system). The (sole) policy instrument that has emerged from the orthodox theoretical unification - New Consensus Macroeconomics - is inflation targeting monetary policy, in which central banks’ manipulation of short term interest rates is believed to secure optimal economic growth, full employment and economic stability.

However, the global penetration of all of these orthodox ideas into institutions, regulations and practices have been followed by increased economic volatility, increased income inequality, an ongoing economic crisis, and a financial sector dominating the real economy. Unemployment levels in both Europe and the USA have reached unacceptable levels. There is still no clear sign of recovery, but there are clear tendencies of social unrest due to imposed austerity measures both in Europe and in the USA. It is also clear that the orthodox instrument, interest rate manipulation, has not been able to contain the crisis, neither has massive infusions of money from central banks into the financial sector in order to protect system critical banks from bankruptcy (this has effectively transferred private debt from failed speculations to society as a whole, forcing governments to implement austerity measures which undoubtedly hamper growth and recovery).

The empirical evidence of the failure of economic policies founded on orthodoxy cannot be denied. Consequently, in order to avoid similar - and possibly even worse - crises in the future, there is a strong need for revisions of some of the most fundamental theoretical pillars of current economic policy. This paper claims that Keynes’ insights are highly relevant in this respect, and proceeds as follows.

Section 2 briefly describes the essence of rational expectations theory as

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7 The orthodox rule in universities’ economics departments and business schools has provided that orthodox views dominate among central bankers, governments’ economic advisors and leading economic journals. Thus, careers are tied to this ideology.

8 According to Der Spiegel, 08/22/2011, in 2010 world GDP - the total value of all goods and services - totalled USD 63 trillion. In comparison the volume of shares and bonds was USD 87 trillion, the off-exchange trading of financial derivatives amounted to USD 601 trillion, and the total volume of foreign currency transactions was USD 955 trillion.

9 Inflation targeting has mistakenly been credited for low and stable inflation. An essential reason of the evolution of prices is undoubtedly the enormous release of cheap labour in China, with farmers moving from rural areas to industrial production in large cities. Increased competition due to globalisation is also likely to have pushed wage levels down and thus contributed to low and stable prices.
well as of the very influential "Lucas critique". Section 3 gives an overview of essential Keynesian ideas which orthodoxy ignores or rejects (or have not understood), namely the concepts of "conventional expectations", "liquidity preference", "supply and demand prices" and "effective demand". In section 4 a relationship between stock markets, credit growth, "idle balances" (savings accounts) and economic instability is postulated to be a consequence of the instability mechanism created by conventional expectations and confidence. Understanding this instability mechanism is the key to understanding the relationship between deregulations, growth of stock markets and financial institutions relative to the real economy, and the frequency and severity of economic crises. Section 5, supporting the effective demand model in the next section, develops a structural model of the dynamic interrelation-ship between expectations and economic outcomes. Section 6 integrates the fundamental ideas into a parsimonious dynamic time series error correction model. It shows how state dependent expectations and risk assessment may generate equality or inequality of supply and demand prices, describing the primary cause of fluctuations of real variables in monetary market economies. This section introduces an overlooked or misunderstood point - I believe also among heterodox writers - in interpretations of the GT, namely that Keynes' "supply price" can be understood in terms of minimum required revenues for a given profit maximising level of employment, corresponding to a growth rate of employment equal to zero. It is necessary to include liquidity preference explicitly in the analysis in order to obtain adjustment for uncertainty, which Keynes' did not do in his formal model. This modification gives us a supply price describing uncertainty-adjusted minimum required revenues, which are just sufficient for a certain level of employment to be upheld (risk and uncertainty are used interchangeably in this paper). This section also includes an analysis Keynes left out: why booms and busts appear to be persistent, i.e. why we observe trends in one direction or the other. Discussed (and rejected) is also Keynes' "fundamental law" of the relationship between consumption and income. Finally, section 7 sums up, discusses and concludes.

To the best of my knowledge no similar approach to Keynes' shifting effective demand has ever been presented before.
2. Rational expectations theory and Lucas’ critique

According to Mishkin (1986) p. 9: "The rational expectations hypothesis [hereafter REH, my comment] asserts that the market’s subjective probability distribution of any variable is equal to the objective probability distribution of that variable, conditional on all available information. [...] The rational expectations implication central to this book’s analysis is the following: the expectation assessed by the market equals the true conditional expectation using all past available information.” This is exemplified, for a variable $X$, by the following equation:

$$E_m(X_t|\Phi_{t-1}) = E(X_t|\Phi_{t-1}).$$  \hspace{1cm} (1)

where $E_m(X_t)$ is the subjective expectation of the variable $X_t$, $\Phi_{t-1}$ is the available information on which the expectation is conditioned, and $E(X_t)$ is the objective expected value, which must be interpreted as the true average value of $X_t$, and that the objective expectation is independent of the market expectation (i.e. market forecasts). This implies a predestined future.

Mishkin then relates the rational expectations definition to financial markets and market efficiency (p. 9): "[T]he application of rational expectations to financial markets - where it is referred to as market efficiency - shows why the rational expectations hypothesis should be taken seriously in explaining empirical phenomena.” In this objective probability distribution framework it is possible to define "true fundamental prices”. Thus, rational agents (in the sense of having orthodox rational expectations, knowing the true model) easily detect deviations from the true value. By selling overpriced securities and buying underpriced securities, mispricings are eliminated, and the fundamental orthodox "no arbitrage theorem” is satisfied. This is the "efficient market hypothesis”. However, if the "true fundamental price” is created by our sentiments, the no arbitrage theorem is nonsensical in its current form. A long term sustainability view (i.e. a reasonable price, cf. Keynes’ notion of "enterprise” in ch. 12 in the GT) is more appropriate as an anchor for something like a "fundamental price”.

Building on the same rational expectations foundation and its objective probability distributions, Lucas (1976) formulated his very influential critique of the macroeconomic modeling approach of central banks and analysts at that time. The result has been a consensus that all macroeconomic models must satisfy certain requirements identified as necessary in order to avoid the Lucas critique (LQ), and that markets should be as free as possible. There
can be no doubt that LQ has contributed strongly to the anomalistic development of financial markets that have taken place during the last decades. The essence of LQ is as follows. Macroeconomic outcomes of a vector of endogenous variables $y_t$ (among which potential GDP might be one variable, the unemployment rate another) are described by:

$$y_{t+1} = f(y_t, x_t, \theta, \epsilon_t),$$  \hspace{1cm} (2)

where $x_t$ are exogenous forcing variables. Economic policy is viewed as a specification of present and future values of some components of $x_t$, according to Lucas. $\theta$ is a vector of parameters, and $\epsilon_t$ is a vector of random shocks. The task of the (central bank) analyst is to estimate $\theta$ and evaluate the effects of manipulations of $x_t$ by active monetary policy. The problem, said Lucas, is that the parameter vector $\theta$ is a function of the policy regime, called $\lambda$ in Lucas’ notation. Hence, according to Lucas, we have that

$$y_{t+1} = f(y_t, x_t, \theta(\lambda), \epsilon_t).$$  \hspace{1cm} (3)

Hence, when policy ($\lambda$) changes so does $\theta$ because people have rational expectations and see through government manipulation of increasing or reducing the quantity of money, leaving policy intervention useless. In accordance with this mechanism is the "Policy Ineffectiveness Proposition" of Sargent and Wallace (1974). Econometric models should therefore aim at estimating the "structural parameters", the true and objective model parameters governing macroeconomic outcomes, which are invariant to policy. Note the axiomatic postulate here: the existence of objective structural parameters which are independent of policy. In order to be able to estimate structural parameters one has to put certain restrictions on the estimated models. This has led to the development of the previously mentioned "structural vector autoregressive models" (SVAR) and impulse response analysis, which has become the analytic tool of central banks, underlying decisions about interest rate manipulations. It follows that if the rational expectations hypothesis is misleading, then any analytical method based on it, empirical or theoretical, must also be misleading. The view held in this paper is that, yes, parameters change when circumstances change, but this change is primarily due to an underlying behavioural structure, with sentiment as the forcing variable, and with the ability to generate instability. I suggest that the strength of this behavioural forcing structure depends on the degree of market regulation. This means that it is likely to observe more instability and more severe crises
under laissez-faire regimes than under mixed regimes like in the Scandina-
avian model, where the latent behavioural parameters to a larger degree are
restricted by policy, combined with well developed social security. Hence we
can talk about ”regime dependent ergodicity” of macroeconomic outcomes\textsuperscript{10}.

3. The fundamental Keynesian ideas

3.1. Conventional expectations

In strong contrast to the rational expectations hypothesis, the way market
agents assess the future is explained by the concept of ”conventional expec-
tation” in chapter 12 in the GT. Conventional expectations mean that ”the
current state of affairs” is expected to prevail in future periods of unspecified
duration, and that the convention depends on the prevailing sentiment in
the market. In a recent cognitive psychology paper on opinion formation,
Castelfranchi et al. (2007) analyse the normative component of a convention
adopted by a population of cognitive agents. They claim that even simple
predictions developed to anticipate future state of affairs have an intrinsic
tendency to evolve in full expectations and then in prescriptions. This phe-
nomenon may occur either at the individual level, at the interpersonal level
or, at the collective macrosocial level. The reason is that we need to antic-
ipate the future in order to cope with our anxiety and avoid disorientation,
and we seek validation for our anticipations. Invalidation of forecasts (i.e.
”disappointed expectations”) may cause distress such that new anticipations
emerge and behaviour changes. That is, conventions may be maintained
or break down, depending on the relationship between actual outcomes and
predictions. The findings of these authors are fully compatible with Keynes’
ideas, presented more than 70 years earlier. A similar idea, well known in
the literature and leading to extrapolative expectations, is that information
is collected selectively (”it is different this time”). Such cognitive biases
contribute to that warnings are ignored, and are certainly at odds with the
rational expectations hypothesis.

\textsuperscript{10}Davidson (2008) claims that one fundamental flaw of orthodoxy is the belief in the
ergodic axiom, i.e. the belief in stable objective probability distributions of macroeconomic
outcomes. I believe, however, that obvious statistical regularities, for example in the form
of systematic co-trending, but also recurrent booms and busts, indicate that some form of
ergodicity is present, and that we can learn about these from econometric models. But, we
must ”let the data speak freely”, without axiomatic restrictions as in the SVAR approach.
Within a certain convention, according to Keynes, it is possible to make calculations of prospective advantages and disadvantages of investment, summarised in the marginal efficiency of capital (which is an expected internal rate of return, we shall return to it). An implication of Keynes’ claim is that "profit maximisation" and present value calculations - dependent on how much firms expect to sell, the expected sales price and costs, and the degree of uncertainty related to these expectations - will depend on the prevailing aggregate state of sentiment. Therefore, shifting sentiments imply shifting views of what an optimal adaptation is, both for employers and employees. This invalidates completely the microeconomic utility and profit maximisation rationale behind the existence of stable "natural" rates or growth paths predicted by orthodox theory.

About the stability of the convention Keynes said (GT, pp. 152-4): "Nevertheless the above conventional method of calculation will be compatible with a considerable measure of continuity and stability of our affairs, so long as we can rely on the maintenance of the convention. For if there exist organised investment markets and if we can rely on the maintenance of the convention, an investor can legitimately encourage himself with the idea that the only risk he runs is that of a genuine change in news over the near future, as to the likelihood of which he can attempt to form his own judgement, and which is unlikely to be very large. For, assuming that the convention holds good, it is only these changes which can affect the value of his investment".

And, in his later defense of the GT Keynes wrote: [Action] based on so flimsy a foundation, it is liable to sudden and violent changes. [...] New fears and hopes will, without warning, take charge of human conduct. The forces of disillusion may suddenly impose a new conventional basis of valuation.” (Keynes (1937) p. 115.)

3.2. Effective demand and the supply and demand price analysis

The analytical device used by Keynes to portray labour hiring decisions of entrepreneurs (i.e. firms or employers in general) and the level of employment is his "effective demand", in which there is an intersection of an aggregate supply price $Z$ and an aggregate demand price $D$. In Keynes’ definition:

Aggregate supply price: "[T]he expectation of proceeds which will just make it worth the while of the entrepreneur to give that employment” (GT p. 24, footnotes omitted, emphasis added); "Let Z be the aggregate supply price of the output from employing N men, the relationship between
Z and N being written \( Z = \phi(N) \), which can be called the *Aggregate Supply Function*". (GT p. 25, footnote omitted.)

**Aggregate demand price:** Similarly, let \( D \) be the proceeds which entrepreneurs expect to receive from the employment of \( N \) men, the relationship between \( D \) and \( N \) being written \( D = f(N) \), which can be called the *Aggregate Demand Function*.” (GT p. 25.)

Keynes' explanation of how a change in employment comes about is:

"Now if for a given value of \( N \) the expected proceeds are greater than the expected supply price, *i.e.* if \( D \) are greater than \( Z \), there will be an incentive to entrepreneurs to increase employment beyond \( N \) and, if necessary, to raise costs by competing with one another for the factors of production up to the value of \( N \) for which \( Z \) has become equal to \( D \).” (GT p. 25. Emphasis added.)

An overlooked but highly important detail, in my opinion, is that Keynes' supply price \( Z \) must be the future cash flows that generate a *minimum required return* for a given amount of employment and other factor costs. Such an interpretation follows from his own definition of the supply price: "[T]he expectation of proceeds which will *just* make it worth the while...": that is, revenues below \( Z \) will not make it worth the while to give a certain amount of employment. Consequently, whenever *actual* demand corresponds to \( Z \) there will be no change in the level of employment, *i.e.* the growth rate of employment is zero. A full understanding of Keynes' supply and demand price analysis and its relevance for economic instability is hard to obtain if this point is overlooked. In order to bring the analysis in line with what we actually observe, we also need to allow for persistency of employment growth rates when these are different from zero. Keynes did not address this point.

In Keynes' exposition the deviations from the steady state condition in which there is no change in the level of employment (a zero employment growth rate equilibrium) are caused by *actual* expectations of future cash flows given that level of employment and factor costs. These deviations are described by the demand price \( D \), such that the *difference between \( Z \) and \( D \)* brings about changes in employment, *implying* positive or negative growth rates of employment. These growth rates can also be understood as state dependent equilibria, in the sense of being determined by a certain average macroeconomic sentiment, a convention.

In order to understand the full scope of Keynes' argument in the GT about fluctuations in employment, it is necessary to include not only variations in expectations, but also a measure of variations in entrepreneurs' (employers')
confidence. Keynes gave no formal representation of how both factors might affect both the supply and the demand price.

3.3. Adjustment of expectations

Keynes’ attitude to the role of disappointed expectations and adjustment of expectations and confidence may appear confusing. This confusion is attempted resolved by Kregel (1976), pp. 213-215: “It was this purely static model, divorced from disappointment and shifts in expectations that Keynes finally preferred to use for demonstrating that unemployment was not a short-run disequilibrium phenomenon [...]. In his complete dynamic model of shifting equilibrium, ”current disappointment may affect the state of general expectations.”

According to Kregel the simpler model seems to be preferred for convenience, since its conclusion does not change in a more complex model. Nevertheless, in the GT Keynes actually attributed the turning point of ”the trade cycle” to disappointed expectations, which is consistent with his descriptions of conventional expectations, their maintenance and their breakdown. Keynes’ attitude in the GT is stated clearly in the following quote: ”[a theory of shifting equilibrium is a theory of] a system in which changing views about the future are capable of influencing the present situation.[...] [In the real world] our previous expectations are liable to disappointment and expectations about the future affect what we do to-day” (GT pp. 293-4). And, on p. 50 in the GT Keynes states that ”...in practice there is a large overlap between the effects on employment of the realised sale-proceeds expected from current output; and producers’ forecasts are more often gradually modified in the light of results than in anticipation of prospective changes”.

Thus, the phenomenon of shifting conventions (i.e. state dependent expectations and uncertainty), induced by errors in expectations, seems to be a factor in Keynes’ intuition about the causes of shifts in effective demand, cf. also the maintenance of a convention when there is ”no genuine change in the news”. He is not explicit, though, about the impact of shifts in short term expectations on long term expectations, the latter being ”liable to sudden fluctuations” and, according to Keynes, the primary cause of economic fluctuations due to its effect on real capital investments. A sharp distinction between long and short term expectations is not made in this paper, but a notion of the general sentiment (”state of expectation and confidence”) is emphasised. As Keynes also pointed out, ”expectations and confidence” determine how much of our income we choose to consume and how to store
income which is not consumed. Hence "the state of expectation and confidence" (unspecified time horizon) determines both aggregate consumption and investment demand, which in turn must determine whether firms’ expectations will be fulfilled or disappointed. The GT lacks an explicit analysis of this kind of endogeneity.

A logical implication of the reasoning above is that expectations, confidence and actual outcomes are endogenously related to each other in the long run. If so there may be persistent trends in real economic activity, both up and down. The Rational Expectations paradigm, in which deviations from stable natural rates are due to exogenous shocks, does not at all consider this possibility. But, in my opinion, we can find the building blocks of such a trend-generating mechanism in the GT.

4. Predictions based on liquidity preference and conventional expectations

Under the surface of a boom convention the economy becomes increasingly fragile due to non-sustainable credit growth. Furthermore, precautionary capital buffers (saving deposits) are driven down, thus fueling demand together with high credit growth. At some point demand will fall short of the growth requirement - the growth necessary to satisfy profit requirements - due to increasing debt service costs and prices, and bankruptcies start to occur. This fundamental change in the flow of news causes a breakdown of the convention, such that uncertainty increases, with the following macroeconomic consequences: precautionary demand for money as a store of wealth increases, (i.e. saving deposits - "idle balances" - increase); consumption and investment decrease, and supply and demand for credit decrease. Reduced aggregate demand reduces firms’ profits, which is reflected in falling stock prices. These are the predictions of Keynes’ liquidity preference theory, describing a "shifting effective demand equilibrium" in which there may be steady state equilibria of low, as well as of high, levels of employment. Orthodox economists never implemented these features of the real world into their theory.

An interesting field of enquiry is the identification of important (market) factors which might influence the state of sentiment in deregulated market

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11C. Minsky’s "diminishing safety margins" during booms, see e.g. Minsky (1975).
economies. For obvious reasons the stock market is a candidate, since the foundation of stock prices is the expected rate of return of firms. It is therefore reasonable to believe that the evolution of the stock market as a whole, assumedly representing the judgements of experts and informed traders, affects the aggregate sentiment\(^\text{12}\) as regards expected macroeconomic performance and the associated risk. Obviously, the resulting behaviour - increased consumption and increased borrowing - feeds back on the stock market via the resulting macroeconomic outcomes. Therefore we would expect positive long term equilibrium relationships between nonstationary stock index prices and macroeconomic variables like aggregate credit growth, consumption, inactive balances and unemployment. Applying the Johansen cointegration method this hypothesis was clearly supported in Lauvsnes (2009), using data from USA and Norway.

Thus, since credit supply and demand is highly sentiment dependent there is the obvious possibility that, in deregulated market economies, stock markets contribute not only to excessive credit financed speculation with financial assets - which definitely contributes to an increase in the size of financial markets and instruments relative to the real economy - but also to non-sustainable credit financed consumption. Note that it is not merely the traditional "wealth effect" which has been described here, but the effect on expectations and risk assessment\(^\text{13}\). If this mechanism holds, it is reasonable to say that the orthodox institutional regime contributes to increased macroeconomic vulnerability and instability, and not, as the theory of efficient markets postulates, to stability. Thus, the "liquidity" argument set forth by stock market and financial instrument proponents would not be valid, on the contrary: liquidity would simply be a mirror image of the state dependent growth process, improving during the upturn and quickly deteriorating during the downturn, subject to the same underlying driving forces. In other words, liquidity of financial instruments would depend on the com-

\(^{12}\)Note the fundamental difference between this explanation of aggregate expectations coordination and for example the coordinating "sunspot variable" in Jeanne and Mason (2000) (professor J.D. Hamilton, see also section 3.1, kindly made me aware of this paper). Their constructed variable govern the transition from one state (equilibrium) of the economy to another.

\(^{13}\)We cannot ignore traditional wealth effects of course, neither in the sense of a balance sheet effect (borrowing capacity) nor of the psychological effect of "feeling rich", which also can be said to affect sentiment.
Combination of credit growth and the infusion of idle balances into the financial economy, following the cumulative shifting equilibrium dynamics. Therefore, instability is likely to increase with the size of financial markets relative to the real economy.

5. An alternative to the rational expectations hypothesis

5.1. The conventional expectations hypothesis (CEH)

The fundamental cause of a persistent positive (or negative) \(D - Z\) gap is postulated to be a self-fulfilling mechanism, such that economic ”news” during a boom tends to be positive and expectations tend to be not disappointed. This mechanism can be illustrated by a dynamic structure including the relationship between realised outcomes of a variable \(y_t\), expectations of \(y_t\) i.e. the forecast \(e(y_t)\), a risk assessment (or confidence) parameter \(l_t\), state of sentiment generation \((S_t)\) and behaviour:

\[
y_t \rightarrow [y_t - e(y_t)] \rightarrow e(y_{t+1}), l_t \rightarrow S_t \rightarrow Behaviour_t \rightarrow \\
y_{t+1} \rightarrow [y_{t+1} - e(y_{t+1})] \rightarrow e(y_{t+2}), l_{t+1} \rightarrow S_{t+1} \rightarrow Behaviour_{t+1}...
\]

The idea is that realised values of economic variables (revenues \(pQ_t\) is one relevant variable) enter as inputs in the determination of the state of sentiment, \(S_t\). The state of sentiment, i.e. the state of expectation and confidence, depends on whether previously held forecasts are disappointed or not. In an optimistic mood, non-disappointment maintains a positive \(D - Z\) gap based on the conventional view that the near future will be similar. This leads to higher labour demand.

5.2. A VECM representation of the CEH

Starting with an unrestricted VAR (UVAR), i.e. a vector autoregression model without ”cointegration restrictions”, the expectation structure above can be formulated as a matrix system. Define \(x_t = (x_{1t}, x_{2t})\), where \(x_{1t} = y_t\) and \(x_{2t} = e_{t-1}(y_t)\). Then

\[
x_t = A_0 + A_1 x_{t-1} + \epsilon_{S_t}, \tag{4}
\]
where $\epsilon_S \sim NID$. The $2 \times 2$ matrix $A_0$ of constant terms (assumed state dependent) can be rewritten$^{14}$ as $\alpha \beta_0 + \gamma_0 \beta_0$. The term $\beta_0$ represents the state dependent expectation of a change in $x$. The function of $\gamma_0$ is explained below. An equilibrium correction representation of the system in equation (4) is obtained by subtracting $x_{t-1}$ from both sides of (4):

$$x_t - x_{t-1} = \Delta x_t = A_0 + (A_1 - I)x_{t-1} + \epsilon_t$$  \hspace{1cm} (5)

For an equilibrium relation between expectations and realisations to exist, the matrix $\Pi$ must have reduced rank$^{15}$ $r$, in this bivariate case $r = 1$. Then we can decompose $\Pi$ into two new matrices: $\Pi = \alpha \beta'$, where $\alpha$ is a $2 \times 1$ column vector and $\beta'$ is a $1 \times 2$ row vector:

$$\Pi = \begin{bmatrix} \alpha_1 \\ \alpha_2 \end{bmatrix} [\beta_1, -\beta_2].$$  \hspace{1cm} (6)

In addition to the reduced rank restriction on the $\Pi$ matrix, we can normalise on $x_{1t}$, such that $\beta_1 = 1$. Together with the simplifying coefficient restriction that also $\beta_2 = 1$, we get the following VECM

$$\Delta x_t = A_0 + \alpha \beta' x_{t-1} + \epsilon_t.$$  \hspace{1cm} (7)

With the imposed restrictions we have that that $\beta' x_t = \beta_1 y_t - \beta_2 e_{t-1}(y_t) = y_t - (y_{t-1} + \beta_0) = \Delta y_t - \beta_0 = \xi_t$. With

$$A_0 = \begin{bmatrix} \alpha_1 \beta_0 + \gamma_0 \beta_0 \\ \alpha_2 \beta_0 + \gamma_0 \beta_0 \end{bmatrix},$$  \hspace{1cm} (8)

the system written out in full is (note: since this is a "chicken and egg" relationship we could just as well have switched time subscripts on the two variables of the system):

$$\begin{bmatrix} \Delta y_t \\ \Delta e_{t-1}(y_t) \end{bmatrix} = \begin{bmatrix} \alpha_1 \beta_0 + \gamma_0 \beta_0 \\ \alpha_2 \beta_0 + \gamma_0 \beta_0 \end{bmatrix} + \begin{bmatrix} \alpha_1 \\ \alpha_2 \end{bmatrix} [y_{t-1} - e_{t-2}(y_{t-1})] + \begin{bmatrix} \epsilon_{1t} \\ \epsilon_{2t} \end{bmatrix}. \hspace{1cm} (9)$$

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$^{14}$See Juselius (2006) p. 97 for a similar decomposition of the unrestricted constant term in a model without state dependency.

$^{15}$See Johansen (1995)
The parameter $\gamma_0$ determines the sensitivity of behaviour to expectations.

We shall assume that there is a positive relationship\textsuperscript{16} between aggregate expectations, behaviour and outcomes, such that $0 < \gamma_0 < 1$.

Since $\Delta y_t = \beta_0(S_t) + \xi_t$ we can rewrite the VECM as
\[ \begin{bmatrix} \Delta y_t \\ \Delta e_{t-1}(y_t) \end{bmatrix} = \begin{bmatrix} \alpha_1 \beta_0 + \gamma_0_1 \beta_0 \\ \alpha_2 \beta_0 + \gamma_0_2 \beta_0 \end{bmatrix} + \begin{bmatrix} \alpha_1 \\ \alpha_2 \end{bmatrix} (\Delta y_{t-1} - \beta_0) + \begin{bmatrix} \epsilon_{1t} \\ \epsilon_{2t} \end{bmatrix}. \] (10)

Multiplying out the error correction term yields
\[ \begin{bmatrix} \Delta y_t \\ \Delta e_{t-1}(y_t) \end{bmatrix} = \begin{bmatrix} \gamma_0_1 \beta_0 \\ \gamma_0_2 \beta_0 \end{bmatrix} + \begin{bmatrix} \alpha_1 \\ \alpha_2 \end{bmatrix} \Delta y_{t-1} + \begin{bmatrix} \epsilon_{1t} \\ \epsilon_{2t} \end{bmatrix}. \] (11)

We can now calculate a hypothetical state dependent mean value for the observable variable, $\Delta y_t$, i.e. a constant value towards which $\Delta y_t$ approaches conditional on each state (an attractor). A steady state value implies that $\Delta y_t = \Delta y_{t-1} = E(\Delta y_t|S_t) = \mu(S_t)$, and that $\epsilon_{it} = 0$:
\[ \begin{align*}
\mu(S_t) &= \gamma_0_1 \beta_0 + \alpha_1 \mu(S_t) \\
\mu(S_t)(1 - \alpha_1) &= \gamma_0_1 \beta_0 \\
\mu(S_t) &= \frac{\gamma_0_1 \beta_0}{1 - \alpha_1}.
\end{align*} \] (12)

If we analyse the model in terms of deviations from state dependent mean $\mu$ (assuming $\mu(S_t) = \mu(S_{t-1})$, i.e. persistence), we get
\[ \begin{align*}
\Delta y_t - \mu(S_t) &= \alpha_1 [\Delta y_{t-1} - \mu(S_{t-1})] + \epsilon_{1t} \\
\frac{\Delta y_t - \gamma_0_1 \beta_0}{1 - \alpha_1} &= \alpha_1 [\Delta y_{t-1} - \frac{\gamma_0_1 \beta_0}{1 - \alpha_1}] + \epsilon_{1t} \\
\Delta y_t &= \frac{\gamma_0_1 \beta_0 (1 - \alpha)}{1 - \alpha} + \alpha_1 \Delta y_{t-1} + \epsilon_{1t} \\
\Delta y_t &= \gamma_0_1 \beta_0 + \alpha_1 \Delta y_{t-1} + \epsilon_{1t},
\end{align*} \]
which is similar to the first line of eqn. (11). This model is identical to Hamilton’s (ibid) regime-switching model\textsuperscript{17} (without a constant term), implying that Hamilton’s estimation technique using Markov-switching can be

\textsuperscript{16}Ability to carry out transactions in accordance with expectations obviously affect macroeconomic outcomes. Thus $\gamma_0$ could be a function of ability, and then state dependent. This possibility is ignored here.

\textsuperscript{17}See equation 22.1.3 p. 677.
applied in order to make inferences about the state dependent growth rates of observed variables. Note however, that Markov-switching models assume invariant transition probabilities as the underlying "data generating process", i.e. ergodicity. The view taken here is that transition probabilities and other parameters (slope coefficients, constant terms, variances) depend on the prevailing regulatory regime. This view could be labeled "policy regime dependent ergodicity".

If we let $\gamma_{01} + \alpha_1 = 1$, implying that the change in $y_t$ is a weighted average of the (previously made) risk adjusted forecast and the most recent actual change, we get $\gamma_{01} = 1 - \alpha_1$. Inserting this result into (12) yields

$$
\mu(S_t) = (1 - \alpha_1)\beta_0 + \alpha_1\mu(S_t)
$$

$$
\mu(S_t)(1 - \alpha_1) = (1 - \alpha_1)\beta_0
$$

$$
\mu(S_t) = \beta_0,
$$

which can be found directly from the last line of equation (12). Under the assumption that there is systematic persistence in each state (the required condition for this to be the case is analysed in Hamilton (ibid)), this mechanism generates piecewise linear trends, both up and down. The problem of disentangling $\gamma_{01}\beta_0$ still remains, however, but $\beta_0$ can be calculated when we know $\alpha_1$ and $\gamma_{01}\beta_0 = \upsilon_1$ from the estimation of the last line of (13), or we can calculate $\gamma_{01}$ from the estimate of the first line of (13). Note also that under the assumption that $\alpha_1 = 1$, the change in $y_t$ has a unit root, i.e. $\Delta y_t$ would be characterised by a random walk, and the CEH would fail to hold. Finally, note that the CEH satisfies the fundamental claim of the REH, namely that expectations are on average correct. However, the macroeconomic result of the CEH is completely different.

6. A dynamic shifting equilibrium interpretation of Keynes’ effective demand

6.1. The supply price and the minimum required rate of return

The essential point in the following analysis is that some factor costs are incurred at the beginning of a project, while income flows - the "proceeds" - appear at a later date. Keynes’ supply price, denoting the minimum required proceeds, can be illustrated, stylistically, by an ordinary net present value
(NPV) calculation performed by an entrepreneur or employer in general:

\[ NPV_t = 0 = -I_t + \sum_{i=1}^{T} \frac{CF_{t+i}^{min}}{(1+k)^{t+i}}. \]  

(15)

The future cash flows which, when discounted by the rate \( k \), make the net present value \( NPV_t \) equal zero, constitute the necessary - or minimum required - proceeds. Stated differently, the discount rate \( k \) constitutes the minimum required rate of return, and \( CF_{t+i}^{min} \) are the future cash flows which exactly satisfy this rate of return.

In this exposition the investment \( I_t \) is the equity share cash outflow of factor costs, \( WL + \delta K \), which are necessary to install and pay (at time \( t \)) before goods can be brought to the market for sale (from time \( t + 1 \) to the end of the project period, time \( T \)). \( W \) and \( \delta \) are the prices per unit of labour \( L \) and capital \( K \) respectively. Other working capital needs than outlays to labour are included in \( K \). The future cash flows \( \sum CF_{t+i}^{min} \) are the minimum required (conditional on \( k \)) net cash flows to equity, i.e. the sales price \( p \) times demand \( \sum Q_{t+i} \) less costs \( \sum C_{t+i} \) (consisting of debt service commitments: interest costs plus repayments), changes in working capital, fixed costs and reinvestments which are necessary to keep the stock of capital intact). Thus, \( \sum CF_{t+i}^{min} = \sum pQ_{t+i}^{min} - \sum C_{t+i} \). It follows that for a given level of \( CF_{t+i}^{min} \), if for example debt service commitments increase due to an increase in the level of debt or an increase in the level of the interest rate paid, \( NPV_t \) could become negative. This implies that the expected rate of return is less than the minimum required rate of return. On the other hand, actual \( \sum CF_{t+i} \) may exceed \( \sum C_{t+i} \) sufficiently to make the \( NPV_t > 0 \), and hence the expected rate of return exceeds the minimum required rate of return \( k \).

A convenient simplification for later use is to rewrite the present value using a ”gross rate of return” \( q \):

\[ \sum_{i=1}^{T} \frac{CF_{t+i}^{min}}{(1+k)^{t+i}} = \frac{\sum_{i=1}^{T} CF_{t+i}^{min}}{1 + q^{min}} = \frac{Z}{1 + q^{min}}. \]  

(16)

Then we can write the supply price \( Z_t \) simply as

\[ SP_t = Z_t = (WL + \delta K)_t(1 + q^{min}), \]  

(17)

or

\[ Z_t = (WL + \delta K)_t + \Pi^{min}, \]  

(18)
where $\Pi_{min}$ is the minimum required profit equal to $(WL + \delta K)_t \cdot q_{min}$.

The factor costs $I_t = (WL + \delta K)_t$ result from production capacity being scaled, in the present (time $t$), according to actually expected demand. Keynes made no explicit notice of this scaling - or attempted optimisation - in his definition of supply and demand prices. However, firms assumedly follow this sequence when evaluating profitability: 1) Forecast future demand for the project period, $\sum e(Q)$. 2) Scale production factors accordingly, obtain factor costs $I_t$ (the equity share) as a function of expected demand, i.e. $I[e(Q)]$. Note that these factor costs (the use of labour $L$ and capital $K$) result from a cost minimising calculation conditional on a fixed production quantity (fixed by expectation, i.e. the forecast of demand conditional on the state of sentiment). Hence $I[e(Q)]$ is determined by the optimal, cost minimising - and profit maximising when sales quantity is fixed by expectation - combination of labour and capital, which we now denote by $I^*$ (in addition to being determined by the "state of credit, i.e. the willingness of the banking sector to finance the remaining outflow. In this analysis a ceteris paribus argument is applied, assuming a fixed equity share). Stated in the language of orthodox microeconomics, the entrepreneur tries to find the point where the $L, K$ isoquant is tangent to the lowest possible isocost line. This yields the optimal combination of labour and capital, $L^*$ and $K^*$. 3) Calculate the internal rate of return, $q$. If $q \geq q_{min} = \text{minimum required rate of return}$, then go ahead with the project, if not the project will not be realised. The minimum required proceeds $Z$, the supply price, can thus be deduced from the optimal factor costs $I_t^*$ and the minimum required rate of return $q_{min}$.

The minimum required rate of return consists of a state dependent uncertainty parameter (or risk premium) $l_s$ denoting the uncertainty related to expected demand, plus an opportunity cost $r_f$, which is "the" risk free interest rate (both are gross parameters, comparable to $q$). Hence we can write:

$$Z_t = (1 + r_f + l_s)I[e(Q)] = (1 + r_f + l_s)(WL^* + \delta K^*). \quad (19)$$

Thus, the minimum required return, which makes it just worth the while to demand a certain quantity of labour, is - for a given level of real capital and technology - determined by the return on the benchmark asset money and the degree of uncertainty related to expected demand. The uncertainty factor (or risk premium) $l_s$ - the existence of which invalidates any claim that money is neutral - indicates the degree of liquidity preference, or the safety margin, of an employer. Note that confidence in expectations increases when $l_s$ falls.
Note also that the net cash flow $Z$ depends on the level of indebtedness.

6.2. The demand price and the expected rate of return

The demand price $D$ simply consists of actually expected net future cash flows to equity, i.e. $e(CF_{t+i})$. If $e(\sum CF_{t+i}) > Z = \sum CF_{t+i}^{\min}$ this implies that $q > q^{\min} = r_f + l_s$, i.e. the expected internal rate of return (which has similar properties as Keynes’ “marginal efficiency of capital”) exceeds the minimum required rate of return. In this case the demand price is greater than the supply price, $D > Z$. This gives incentives to entrepreneurs to initiate new projects in order to earn the “excess profit rate” equal to $a = q - (r_f + l_s)$. Hence more labour will be demanded, implying that the growth rate of employment is positive.

In aggregate terms, a positive $D - Z$ gap may be persistent even if $I^*[e(Q)]$ grows, because expectations may rise, and/or uncertainty may fall, persistently. Diminishing risk premia (i.e. diminishing liquidity preference) is consistent with Minsky’s ”diminishing safety margins” during booms (c.f. Minsky (1975)\textsuperscript{18}). Hence there exists a possibility of a persistent positive employment growth rate due to the sentiment effect. Such persistence is facilitated by inflation targeting monetary policy providing low interest rates in a world with low import prices from low cost countries, which reduces debt service commitments.

Maintenance of the aggregate $D - Z$ gap depends on the consumption plus investment demand side of the economy, i.e. aggregate demand. Importantly, the latter determines whether expectations of the production sector are disappointed or not. Both entrepreneurs and consumers live in the same world (and entrepreneurs are also consumers), and I find it realistic to assume that they share the same conventional view about future economic opportunities. Therefore, in an optimistic state there will be increased willingness to borrow/lend combined with the willingness to reduce holdings of precautionary

\textsuperscript{18}Minsky also held that the equity share of investments falls during booms. The constant equity share assumed here is a simplifying assumption not intended to contradict Misky’s hypothesis. It is reasonable to expect that factor costs will rise during a boom due to excess demand. Keynes considered this in the GT (ibid): ”Now if for a given value of $N$ the expected proceeds are greater than the expected supply price, i.e. if $D$ are greater than $Z$, there will be an incentive to entrepreneurs to increase employment beyond $N$ and, if necessary, to raise costs by competing with one another for the factors of production up to the value of $N$ for which $Z$ has become equal to $D.” If we let $I^*[e(Q)]$ fall, this implies that credit must grow even more to compensate.
buffers of money, which fuel demands for consumption and investment assets with higher expected returns than offered on saving deposits. Framed in orthodox microeconomic utility maximisation theory, the same result would emerge by introducing state dependent preferences for consumption now versus in the future\textsuperscript{19}, combined with state dependent budget constraints and absence of any transversality condition. Under such conditions borrowing may be excessive, which reduces the ability to spend in the future to such an extent that a crisis develops.

Thus, reduced safety margins is likely to generate higher demand. A steady increase in demand will validate formerly held expectations, and a conventional view that the present growth will continue is likely to be maintained. However, persistently increasing debt levels (and debt service commitments) make the economy increasingly vulnerable, both to increasing interest rates and to insufficient demand. Sooner or later defaults and bankruptcies start to occur, implying a "genuine change in news": a "Minsky moment" occurs, where the formerly held conventional growth belief is not trusted anymore. This may lower expected demand and increase $l_s$, which may induce an opposite movement due to a negative $D - Z$ gap, resulting in a conventional view with an opposite sign. Hence we may have a persistent downturn with negative employment growth rates. The reason is that firms find their capacity to be oversized with a cost level too high relative to the experienced demand reduction. High levels of debt amplify the necessity of cost reduction (and will also cause bankruptcies). In the short term the easiest way to cut costs is by laying off labour, plus postponing investments. Furthermore, after a fall in employment, a new equilibrating convention might emerge, in which $Z = D$ (precautionary saving and reduced ability to spend because of the high level of debt service commitments hampers growth. Austerity measures also works against growth). This implies a zero growth rate of employment combined with a high level of unemployment.

6.3. The dynamic evolution of employment

The employment dynamics due to the supply and demand price relationship can be represented by a very simple Error Correction Model (ECM) similar to the conventional expectations model above. In order to focus on the

\textsuperscript{19}An important difference is that in Keynesian theory this "preference" is caused by genuine uncertainty, while in orthodox theory it is just a matter of calculating the most profitable (rational) adaptation conditional on a known distribution of outcomes.
essential element, namely labour demand, we write \( K^* \) in terms of \( L^* \), and
we now assume that all variables are expressed in aggregate, macroeconomic
terms, i.e. a summation over all entrepreneurs at each point in time \( t \). If we
apply a standard Cobb-Douglas production function, \( Q = f(L, K) = L^aK^b \),
the optimal use of capital\(^{20}\) is \( K^* = \frac{bW}{a}L^* \). Substituting this result into the
cost function, we get \( WL^* + \delta (\frac{a}{b})L^* = WL^*(1 + \frac{b}{a}) = WL^*\gamma \). The demand
price \( D \) can now be written as
\[ D_t = WL_t^*\gamma_t(1 + q), \]
and in natural logarithms
\[ d_t = w + \lambda_t^* + \gamma_t + q, \]
where \( d_t = \ln(D_t), w = \ln(W), \lambda_t^* = \ln(L_t^*) \). The equilibrium (profit max-
imising) adaption of all employers is that aggregate \( d_t - w - \lambda_t^* - \gamma_t - q = 0 \).
In reality this equilibrium will not hold exactly due to shifting expectations,
confidence and differences between actual outcomes and expectations. Hence
we may have that actual labour demand \( \lambda_t \neq \lambda_t^* \), motivating an adjustment
in \( \lambda_t \). It is easier to adjust labour than capital in the short run. Therefore
it is assumed that \( \lambda_t \) is adjusted first. An adjustment of labour demand
only, however, implies that the labour-capital combination is no longer opti-
mal under the current expectation-risk assessment convention (or ”regime”),
yielding a pressure on capital adjustment also, but, implicitly, with a smaller
adjustment coefficient.

In order to account for the various disequilibrium impulses we need an
equilibrium error, \( \xi_t \), such that \( \lambda_t^* = E(\lambda_t) \), i.e. conditional on the prevailing
aggregate state of sentiment (the convention), labour demand on average
equals the optimal value. We shall assume that the equilibrium error is
stationary, implying that the constituents of the demand price relation do
not wander independently of each other (assuming the opposite does not

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\(^{20}\)This follows from the cost minimising condition, in which the marginal rate of technical
substitution, MRTS, must equal the ratio of factor prices, i.e. \( \frac{f_L}{f_K} = \frac{w}{r} \).

\(^{21}\)An alternative representation is obtained by writing the aggregate sum of factor out-
lays at time \( t \) as a series of future supply price annuity values \( A_T \), i.e. \( A_T = I_t \frac{(1+r)^T}{(1+r)^T-1} \).
\( T \) denotes the average time horizon of all factor investments at time \( t \). Hence there will
on average be \( T \) minimum required annuity values equal to \( A_T \) at each time step. If the
actually expected income annuity is greater than \( A_T \), then \( DP > SP \).
make sense), but stay close to each other in the long run. Then we can write
\[
d_t - w - \lambda_t - \gamma - q_t = \xi_t, \tag{22}
\]
where \( q_t = r_{ft} + l_t + a_t \) denotes the time \( t \) aggregate expected internal (gross) rate of return \(^{22}\) of employers. \( \lambda \) is the actual quantity of labour at time \( t \), a function of (previously) expected demand, \( e(Q) \), which may or may not be the state dependent optimal (equilibrium) value. Thus, equation (22) denotes a long term equilibrium condition which on average is equal to zero, and with a finite variance. I.e. \( \xi_t \) is a stationary equilibrium error, \( E(\xi_t) = 0 \) which implies that \( \lambda_t^* = E(\lambda_t) \). Why must this condition hold in the long run? Because, as explained above, factor inputs will be adjusted towards the profit maximising values, which in the case of fixed production quantities (given by the sales budget) amounts to the cost minimising factor quantities. Hence, \( \lambda_t \) will be adjusted in accordance with the conventional equilibrium condition \( \lambda_t^* = E(\lambda_t) = d_t - w - \gamma_t - q \).

An error correction model (ECM) for labour demand can now be formulated as
\[
\Delta \lambda_t = \mu_1(S_t) + \alpha_1 \xi_{t-1} + u_{1t}. \tag{23}
\]
\( \Delta \lambda_t \) denotes the first log difference of employment, which is, approximately, the growth rate in percent. The parameter \( 0 < \alpha_1 \leq 1 \) measures the speed of adjustment towards the zero mean equilibrium condition: if \( \lambda_{t-1} \) was too high relative to the equilibrium condition, then \( \xi_{t-1} < 0 \). A positive adjustment coefficient provides a downward adjustment of \( \lambda_t \). The intercept \( \mu_1(S_t) \) has been made state dependent\(^{23}\), and the states represent the various conventions of expectations and risk assessment, governing \( d_t \) and \( l_t \), which in turn govern the relationship between the supply price and the demand price and hence \( \lambda_t \).

For example, using a stylistic 3-state representation with \( S_t = 1 = \) optimistic; \( S_t = 2 = \) neutral; \( S_t = 3 = \) pessimistic, we would have, respectively, that \( \mu_1(S_t = 1) > 0; \mu_1(S_t = 2) = 0; \mu_1(S_t = 3) < 0 \). With \( E(\Delta \lambda_t) = \mu_1(S_t) = \Delta \lambda_t^* \), there may thus be persistent trends in the level of employment, in accordance with the sign of \( \mu_1(S_t) \). It follows from the derivation of the constant term in the CEH that \( \mu_1(S_t) = f(a_t) = f(Z_t - D_t) \).

\(^{22}\)Note that \( a_t \) may \( < 0 \), such that \( q_t < r_{ft} + l_t \).

\(^{23}\)Following the same principle as in the derivation of the CEH in section 5.2, though with the parameter \( a_t \) taking the role of \( \beta_0 \).
The relationship between $Z_t$, $D_t$, $a_t$, $\mu(S_t)$ and $E(\Delta \lambda_t)$ can be summarised as follows:

- $Z_t = D_t \iff a_t = 0 \Rightarrow E(\Delta \lambda_t) = 0$,
- $Z_t < D_t \iff a_t > 0 \Rightarrow E(\Delta \lambda_t) > 0$,
- $Z_t > D_t \iff a_t < 0 \Rightarrow E(\Delta \lambda_t) < 0$.

Regarding consumption and capital dynamics, we can use the same equilibrium mechanism, though with different drift and adjustment parameters, such as

$$\Delta k_t = \mu_2(S_t) + \alpha_2 \xi_{t-1} + u_{2t}, \quad (24)$$
$$\Delta c_t = \mu_3(S_t) + \alpha_3 \xi_{t-1} + u_{3t}, \quad (25)$$

where $\Delta k_t$ denotes aggregate percentage change in real capital and $\Delta c_t$ denotes aggregate percentage change in real consumption. The drift terms must have the same state dependent signs as $\mu_1$. We assume that $0 < \alpha_2 < \alpha_1$, enabling slower capital adjustment. Reasonably, employers try to avoid selling off installed capital equipment during downturns (at unfavourable prices) as long as they can.

An important departure from Keynes’ arguments in the GT is that I do not rely on his "psychological law" that people in general consume more when income rises, but less than the rise in income. In the GT argument this creates an increasing "saving glut", which, if not transformed into investments, creates deficient demand. Rather, I suggest that it is the increase of debt service costs that inhibits demand, such that firms’ profit expectations get disappointed. Thus, since borrowers by far outnumber lenders, the determination of the aggregate marginal propensity to consume (MPC) will be dominated by borrowers’ financial ability to consume. The relatively few lenders and high income earners are physically unable to fill it. Increasing income inequalities, with a small fraction of the population commanding an increasing share of aggregate consumption demand capacity will necessarily increase the problem. It follows that aggregate consumption ability gets increasingly vulnerable to interest rate increases the higher the level of debt among the greater fraction of the population becomes. In conclusion, during a boom the aggregate MPC falls because of the combination of i) a deteriorating financial ability to consume among borrowers, and ii) the limited physical ability of lenders and high income earners to compensate. Thus, we can say that Keynes was right about the effect, but from the wrong reason.
7. Concluding remarks

The main insight from the shifting conventional equilibrium model is: people - consumers and producers - make choices based on shared conventions (Keynes' micro- and macrofoundations), i.e. state dependent sentiments, with potentially dire consequences for both the ability and willingness to consume, invest and produce in the future. A conventional expectation is thought of as a state dependent imaginary distribution of future outcomes which becomes homogenised among agents: a common persistent belief with undetermined duration. Further, it has been argued that credit and "idle-balance" driven booms imply a diminishing aggregate marginal propensity (here: ability) to consume, which sooner or later results in disappointed profit expectations and a shift in sentiment. Business cycles can thus be described as the cumulative interaction between sentiment, behaviour and outcomes, generating persistent trends in economic variables (real and financial). The models presented in this paper does not attempt to predict turning points, but to describe the underlying forces which, under favourable conditions, have the ability to generate severe economic crises.

In a world with endogenously shifting sentiments, the interest rate instrument is likely to be insufficient in the pursuit of economic stability. This is because the shifts in both expectations and confidence (the latter governing safety margins, herein risk premia) may overrule central bank interest rates. For example, during a boom, small increases in the central bank rate may be neutralised by opposite changes in the risk premium (possibly amplified by increases in expectations), and during a downturn the opposite is likely to happen. This was clearly demonstrated during the initial phase of the ongoing financial crisis, where central bank rates were significantly reduced. Interbank rates, however, rose dramatically due to uncertainty about the solvency of the entire banking sector. In the face of such scenarios it becomes clear that the interest rate instrument is insufficient in order to prevent - and mitigate - economic crises.

In this perspective, where financial institutions and markets have the ability to create disasters - and with stock markets potentially acting as sentiment coordinators - one cannot defend their current role and size. The orthodox justification does not hold. Therefore, simply including e.g. stock prices in the central bank interest rate reaction function would not be sufficient, because, as argued, the interest rate instrument is itself insufficient. What is needed is a broader menu of policy measures combined with a much
tighter control of financial markets, and above all, with full employment as the overall target. In this respect the Basel III banking reregulation recommendations represent a step in the right direction. These recommendations imply, to a significant extent, that the axiomatic New Consensus faith in the self-healing properties of the market is rejected, thereby abandoning the microeconomic Rational Expectations underpinnings of this faith.

Keynes identified the main driving forces behind economic crises in his General Theory. Necessary conditions for stable full employment are that economic policy, institutions and regulations are able to tame the supply and demand price instability mechanism inherent in market economies, on which financial markets predate. Success, however, can only be achieved if governments are able to carry out the suggested reregulations, which means resisting the powerful forces of the few that have made huge gains from the orthodox regime, to the detriment of the many.

References


