Austrian Business Cycle Theory

An Application to New Zealand’s Recent Boom and Bust

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Abstract

Austrian Business Cycle Theory (ABCT) posits that in order to understand the cause and nature of recessions, an analysis of the preceding boom must be undertaken. In particular, ABCT focuses on credit expansion, un-backed by savings, as being the cause of an unsustainable boom. Un-backed credit expansion results in interest rates prevailing in the economy at a rate lower than that which clears the market. This market clearing rate is determined by the prevailing social time preference. As interest rates coordinate present and future consumption, this un-backed credit expansion initiates the boom by distorting the productive structure of an economy with both malinvestment and over-consumption. This unsustainable boom is inevitably followed by a bust, both malinvestment and over-consumption cannot continue indefinitely.

After further analysis, this theory is applied to New Zealand’s recent boom and bust from around 2002 to the present day to determine whether the economic phenomena observed during this period is consistent with and can be explained by ABCT. The evidence presented in this paper suggests that New Zealand did indeed experience a boom caused by a growth of un-backed credit and interest rates below the market clearing rate. This credit expansion caused significant increases in the money supply due to the nature of fractional reserve banking as well as large gains in goods involved in earlier stages of production, particularly housing and the stock market. For example, from 2002 to 2008, the value of private sector dwellings in New Zealand increased by 140% or an annualised rate of 20%. When this credit expansion was halted towards the end of the boom by Reserve Bank of New Zealand policies, New Zealand experienced a contraction in the money supply, sharp decreases in the value of housing and stocks, a high rate of bankruptcies and continuing persistent unemployment.

From this analysis several recommendations are made. Firstly, as the recession phase of the business cycle is a period where resources are reallocated to their highest value use, any policy which prevents this spontaneous market process from occurring should be avoided. This includes expansionary monetary policy as well as fiscal stimulus and the propping up of bankrupt firms. Secondly, a system of free banking is proposed in order to prevent severe recessions from occurring in the future. Free banking is a system where banks are subject to the same legal principles as other commercial enterprises and are not privy to special regulation or legal privileges such as the ability of a central bank to act as lender of last resort. Due to several competitive factors, the ability of banks to engage in un-backed credit expansion is severely limited under such a system and the possibility of an unsustainable boom reduced.
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1. Introduction

After a significant increase in the rate of bankruptcies, a large drop in the price of housing and stocks and increasing unemployment, New Zealand entered the ‘Great Recession’ or the Global Financial Crisis (GFC) in 2008, from which it is still recovering. This also coincided with major financial problems in The United States of America, Europe and other developed economies with bank failures and corporate bankruptcies being met with unprecedented monetary and fiscal policy both in New Zealand and overseas.

Unemployment in New Zealand over this period increased from a low of 3.5% in mid-2008 to a high of 7.3% in the third quarter of 2012 (Trading Economics, 2012). Between the year 2000 and 2008, the value of housing stock more than doubled from NZ$250 billion to over NZ$600 billion before decreasing sharply in 2008/2009 (Reserve Bank, 2012). Over this same period there were large gains in the New Zealand stock market with the NZX 50 peaking at an index value of around 4200 in 2007 before deflating to 2600 at the beginning of 2009 (Yahoo Finance, 2012). In addition to these features, New Zealand also experienced other phenomena such as increasing household debt leading up to the recession as well as sharply falling interest rates after.

This statistical evidence indicates that New Zealand has been inflicted with and affected by a business cycle, also commonly referred to as the economic cycle, trade cycle or the boom and bust cycle. New Zealand enjoyed a boom in stocks and housing before experiencing a large contraction, the bust stage of the business cycle. This paper aims to describe and understand the nature and cause of the business cycle in New Zealand and prescribe remedies which will ensure recovery and prevention of severe business cycles in the future.

There are many theories in modern economics which seek to explain the nature and causes of business cycles. One of these explanations is Austrian Business Cycle Theory (ABCT) as developed by Austrian School economists such as Ludwig von Mises and F.A. Hayek. Unlike other prominent theories of the business cycle, ABCT places a large amount of emphasis on the boom period leading up to the bust and sees the bust as an inevitable result of the boom; the reason sharp decreases in the value of stocks and housing are observed according to ABCT is that they are artificially inflated during the boom. Furthermore, the bust is necessary in order to reallocate capital according to the preferences of market participants. This capital was misallocated during the boom phase, argues ABCT, due to interference in the economy, the main source of interference being manipulation of the money supply and the interest rate.
ABCT has once again come into the spotlight in recent times, particularly in the United States, due to the disproportionate number of Austrian School economists who predicted the onset of the GFC. Their predictions were based on the implications of ABCT as will be explained in this paper.

This paper seeks to add to the literature by applying ABCT to the recent experience in New Zealand in order to both determine the validity of the theory and explain the causes of the boom and bust experienced by New Zealand over the last decade or so. This will contribute to the understanding of both the New Zealand economy by describing an alternative view to that held by many New Zealand economists, as well as to ABCT by applying the theory to an economy with different characteristics than those where the theory has been applied previously.

The structure of this paper is as follows: firstly, a literature review will be provided describing other studies which test ABCT empirically and/or apply ABCT in a historical setting to determine its explanatory power.

Secondly, this paper will provide an overview and a brief history of the Austrian School of economics as this may be an unfamiliar area for some readers. This will detail the emergence of Austrian methodology, in particular the methodological individualism employed by Austrian scholars, Austrian contributions to ‘mainstream’ thought and predominant contributors to the Austrian School of thought.

Following this, ABCT will then be presented. In order to do this, an analysis of the economic consequences of fractional reserve banking is undertaken in order to identify how certain banking practices can create distortions in the capital structure of an economy. From this we can analyse the role of central banks in modern economies and the economic consequences of interest rate management resulting from the use of monetary policy tools such as the Official Cash Rate (OCR). Common objections and criticisms of ABCT are also considered and discussed as well as Austrian School responses to these points. This aids further in the understanding of the theory.

Having presented a detailed overview of ABCT, an application to New Zealand’s recent boom and bust is undertaken. In this section historical data is used to determine whether ABCT adequately describes and explains business cycles as they relate to New Zealand. Key areas of focus in this report are: credit creation and money supply, interest rates, savings and debt, housing and stock markets as well as unemployment.

Finally, from the understanding of ABCT and its application to New Zealand come policy recommendations both in the areas of fiscal and monetary policy. These recommendations are in
two key areas; firstly, the optimal policy response to a recession and secondly, optimal policy to prevent the onset of a recession in the first place.
2. The Austrian School of Economics

The Austrian School of economics is one of the oldest and influential schools of economic thought. However, it is not an area of economic thought in which most economists in New Zealand are familiar. This is unfortunate as the Austrian School has a lot to offer the field of economics, especially monetary theory, capital theory and business cycle theory, the three areas this paper will deal with. The Austrian School has contributed several major ideas to what can be termed ‘mainstream’ economics including but not limited to; subjective value, opportunity cost, the socialist calculation problem and the use of information in society (Birner & van Zijp, 1994).

The Austrian School was essentially founded by Carl Menger with the publication of *Grundsätze der Volkswirtschaftslehre or Principles of Economics* in 1871. Menger was one of three economists (along with the British economist William Stanley Jevons and the French economist Leon Walras) identified as instigating the ‘marginal revolution’ in economics, or as would be a more correct terminology; the ‘subjective value revolution’ (Salerno, 2010). In *Principles of Economics*, Menger sets forth his theory of price based on the subjective valuations of individual actors, that price is determined at the margin according to the marginal utility of economic actors, as opposed to being a product of labour cost or such. This was a major contribution to the field of economics as it solved the paradox of value associated with the British Classical School’s production cost theory of value. It did this by explaining that as a good becomes less scarce, the marginal utility the consumer gains from consumption of the good falls as a lower valued end can now be satisfied (Salerno, 2010). Thus diamonds, which are of little survival value, have a higher value than water, which is critical for survival, as it has a smaller supply and thus cannot satisfy as many ends as water can. For example, the first unit of a supply of water will most likely be (this cannot be determined a priori) valued higher than the first unit of a supply of diamonds (drinking providing a greater utility than the wearing of a ring). However, as the supply of water increases, lower valued ends can now be satisfied (watering the garden) which provides less marginal utility than the wearing of the ring. As price is determined by marginal utility (an economic actor will not transact unless they value the good more than the money given up to attain that good), diamonds will have the higher price. This subjective valuation theory would later be expanded by Friedrich von Weiser and Eugen Bohm-Bawerk to formulate a coherent theory of capital and interest upon which ABCT is based (Taylor, 1980).

What made Menger distinct from Jevons and Walras (as well as the British Classical School and the German Historical School) was his focus on the individual human actor: “man, with his needs and his command of the means to satisfy them, is himself the point at which economic life both begins...
and ends” (Menger, 1871/2007, p. 108). Thus it is from the work of Menger that the Austrian School’s distinctive method had its roots (Mises, 1949/1996). This is in contrast to various methods of empiricism and positivism employed by members of other prominent twentieth century schools of economic thought. This debate over methods is not new with Austrian scholars having disputed economic methodology since the so called Methodenstreit (‘debate over methods’) of the late nineteenth century.

The Austrian method is largely based on theoretical deductive reasoning based upon axioms of human action. It is individualistically methodological, meaning complex social phenomena are the result of economic interactions between individual human beings and that these complex social phenomena are therefore best observed by understanding how individual humans act. This approach cuts through the complexity of a modern economy and provides an understanding of market fundamentals and processes (Taylor, 1980).

It is from this starting point of methodological individualism that Mises developed his analytical framework, praxeology, encompassing several fields of which economics is the most developed subset. According to Rothbard (1962/2009), other subsets of praxeology include game theory, voting theory and a theory of war and violent actions. By studying human action and reasoning logically, such seemingly complex economic phenomena as interest, prices, profits and inflation could be explained and understood as being grounded in the actions of individuals. In fact, the entire theory of the business cycle can be deduced from the starting axioms of human action.

It is in the area of methodology that many criticisms of the Austrian School are grounded and certain Austrian School economists since Mises have embraced forms of empirics to test economic theories (Pheby, 1988). Notable Austrians such as F.A Hayek and Roger Garrison, for example, have employed diagrammatical devices and empirics to varying degrees (Pheby, 1988). However, The Austrian School remains very much focused on logical deduction from the action axioms to derive theories and reserves the use of empirics not to test for theories, but for enquiries into economic history.
Austrian Business Cycle Theory

Business cycles have been a dominant feature of the modern industrial age, particularly since the 19th century, and have caused severe widespread hardship in various economies. It is important to study business cycles in order to inform policy and prevent future economic hardship in the form of unemployment, bankruptcy, lost savings and lost capital. The approaches of the different business cycle theories in economics vary greatly and as a consequence policy prescriptions also vary widely. Some advocate macroeconomic stabilisation policies through the use of monetary and/or fiscal measures, such as the Keynesian or Monetarist theories. ABCT advocates the opposite, a laissez faire response, as it sees the recession as the natural and necessary response of the market to the preceding boom. Whatever the prescription, a coherent theory of the business cycle must be able to explain several stylised facts of business cycles as cited by Sorensen and Whitta-Jacobsen (2009). These include the fact that investment is observed to be very volatile over the business cycle and that employment is counter cyclical to Gross Domestic Product (GDP).

This paper will outline and analyse ABCT to see whether it has explanatory power with regard to observed features of business cycles. This analysis will incorporate the creation of credit in the modern banking system and how this arises. It will also discuss the effects that the different sources of credit creation have on the capital structure of an economy. Several criticisms of ABCT will then be highlighted and discussed. The progression of the discussion concerning ABCT is outlined below:

A key feature of this paper will be the use of ‘Capital Based Macroeconomics’ as put forth by Garrison (1991). This presents ABCT, as developed by Mises, Hayek and others, using diagrammatical devices. During the 1930’s, it was widely recognised that there were two predominant competing views of the economic cycle, that of F.A. Hayek and that of J. Maynard Keynes (Cochrane, 2001).
However, for a variety of reasons, today the Keynesian view remains most prominent amongst academic economists. Cochrain (2001) attributes this largely to the subsequent work of John Hicks and Paul Samuelson who developed diagrammatical devices such as the IS-LM model and the Keynesian Cross. While diagrammatical devices are an imperfect way to present ideas related to the study of human action, they will aid significantly in the understanding of the theory especially concerning how different economic variables interrelate.

3.1. The Financial System and Credit Creation

In order to understand the Austrian theory of the business cycle, we must first understand how credit is created through financial intermediaries (e.g. banks). The different sources of credit will be of utmost importance in our later discussion of ABCT.

Credit has two main sources in financial markets. Firstly; credit creation can be the result of saving. In this instance, banks act as financial intermediaries and provide a link between savings and investment. Money is saved with the bank in return for interest; these savings are then loaned out to borrowers who also pay interest. The other source of credit comes about through the issuance of loans from monetary deposits held in the bank on behalf of customers (Mises, 1912/1953). This is referred to as fiduciary media creation as this credit is not backed by savings (Mises, 1912/1953).

These two sources have very different effects on the productive structure of an economy according to ABCT. owing to key differences in the legal and economic nature of each type of contract (de Soto, 2009). The second source of credit is characteristic of a system of fractional reserve banking where deposits in the bank (chequing accounts etc.) are lent out with a fraction of deposits remaining as reserves.

Credit expansion as the result of fractional reserve banking comes about as a violation of the monetary irregular deposit contract (de Soto, 2009). In the monetary irregular deposit contract the bank receives deposits from customers where the bank’s purpose is to provide safety over the customer’s assets and provide financial services of value to the customer. The bank is obliged to pay out the full amount of the deposit when and if it is called upon by the customer. Thus, the bank must retain 100% reserves.

This type of contract can be termed an irregular deposit contract as what is being deposited is fungible i.e. identical to other depositor’s goods, as opposed to a regular deposit in which the deposited goods are heterogeneous (de Soto, 2009). At the end of the agreed upon term, the bank is obliged to return the tantundem to the depositor (i.e. an amount of equal quality and quantity but
not necessarily the same exact units) and they must keep the *tantundem* for the duration of the contract (de Soto, 2009).

Loan contracts, where credit is created as the result of savings have several distinct differences as compared to irregular deposit contracts. These differences are shown in Figure 1 below:

*Figure 1: Economic and Legal Differences between Loan Contracts and Irregular Deposit Contracts*

<table>
<thead>
<tr>
<th>Economic Differences</th>
<th>Monetary Loans</th>
<th>Monetary Irregular Deposits</th>
</tr>
</thead>
<tbody>
<tr>
<td>Present goods are exchanged for future goods.</td>
<td>Present goods are exchanged for future goods.</td>
<td>There is complete availability to the lender.</td>
</tr>
<tr>
<td>Full availability is transferred from the lender to the borrower. Ownership is transferred.</td>
<td></td>
<td>Ownership is not transferred.</td>
</tr>
<tr>
<td>Interest is paid as present goods and future goods are exchanged</td>
<td>Interest is not paid as present and future goods are not exchanged</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Legal Differences</th>
<th>Monetary Loans</th>
<th>Monetary Irregular Deposits</th>
</tr>
</thead>
<tbody>
<tr>
<td>The essential element is the transfer of availability of present goods to the borrower</td>
<td>The essential element is safe-keeping of the <em>tantundem</em></td>
<td></td>
</tr>
<tr>
<td>Contract requires the establishment of a term for the return of the loan and interest payments</td>
<td>No term, the contract is on demand</td>
<td></td>
</tr>
<tr>
<td>Borrower’s obligation is to return the <em>tantundem</em> at the end of the term and pay the agreed amount of interest</td>
<td>Depository’s obligation is to keep the <em>tantundem</em> available at all times (100 per cent reserves)</td>
<td></td>
</tr>
</tbody>
</table>

*Source: de Soto (2009)*

While, according to de Soto (2009) the practice of banks loaning out funds received on deposit is a legal violation of the irregular deposit contract, this practice also has economic consequences due to the fact that in this type of contract, present goods are not exchanged for future goods. This is the key difference between the two types of contracts. Loans issued from deposits have adverse effects on the productive structure of an economy as we will see (de Soto, 2009). The depositor still considers the money deposited in the bank to be theirs to draw upon when and if they please thereby contributing to their present ability to consume. The ability to consume in the present therefore has not been sacrificed, but loans have been issued for investment projects or durable consumer goods which cater to consumption in the future (Rothbard, 1962/2009). The signal entrepreneurs receive from the increased supply of credit is that there has been an increase in savings which will inevitably result in an increase in consumption in future time periods; savings can
of course be regarded as delayed or future consumption. This future consumption is therefore catered for by increasing investment projects.

Interest rates coordinate this process. An increase in un-backed credit lowers the interest rate signalling that there has been a decrease in time preference (increased savings) thereby making investment projects that were not profitable at a higher rate of interest profitable (de Soto, 2009). Of course, there hasn’t been an increase in savings but merely a creation of un-backed bank credit.

So not only would the use of deposited funds by banks to make loans be misappropriation, due to the fact that present and future consumption aren’t exchanged, credit is created which is not backed by savings. That is, two people now consider themselves to be owners of the same deposit; the depositor and the recipient of the loan. This has an adverse effect on the capital structure of the economy causing malinvestment toward capital goods and over-consumption as will be discussed in this report.

### 3.2. The Capital Structure

For our analysis, capital is the stock of productive factors that yields a flow of consumptive goods and the capital structure (or productive structure) is the temporal pattern of heterogeneous productive goods which arises due to dynamic market processes (Garrison, 2012). The Austrian theory of capital is most commonly associated with Hayek and uses time along with the heterogeneity of capital as the key variables to analyse. This is because investment is undertaken in order to meet the various future consumptive demands of savers and capital greatly differs according to industry and the stage of production. The Austrian theory of capital differs from other theories because of this emphasis on time and the realisation that capital is not fixed but ever changing and heterogeneous; it cannot be summated or measured as there is no common unit of measurement (Garrison, 2012). Thus, the modern macroeconomic variable for capital, K, severely limits analysis of capital and distortions to the capital structure.

In order to understand how credit expansion from the two sources identified above (savings and fiduciary media) impact the productive structure of an economy, Garrison (1991) makes use of several diagrammatical devices. They are; the Hayekian triangle, the production possibilities frontier (PPF) and the market for loanable funds. The Hayekian triangle is shown in Figure 2.
As Austrian capital theory is concerned with allocation of capital along the stages to consumption, the Hayekian triangle shows this inter-temporal structure of capital and displays the various stages of production along the way to the final goods being consumed. The early stages of production, or higher order goods, are production processes such as research and development or resource extraction. The late stages of production or lower order goods are those closer to consumption, such as transportation or retailing. The diagram is triangular as each stage of production adds value to the product. The logical conclusion from this then is that a ‘longer’ capital structure will yield a greater value of consumer goods in the future as there are more stages of production to add value to natural resources (Garrison, 1991). An observation of this is that wealthy countries tend to have more abundant capital and a greater number of production stages than poorer countries.

The Hayekian triangle can be displayed along with the market for loanable funds and the PPF between consumption and investment to show the structure of an economy in a ‘full employment equilibrium situation’ (Garrison, 1991). The PPF shows the tradeoff between consumption, \( C \), and investment, \( I \), (consumption in the future); there are a given amount of present resources and increasing consumption for example necessarily means decreasing investment; both cannot be increased in the present time period, *ceterus paribus*. The loanable funds market gives the market interest rate, \( i \), as the equilibrium of the supply and demand curves for loanable funds at a given amount of savings and investment, \( S, I \). Supply of loanable funds is determined by the quantity of savings determined by time preference and the demand for loanable funds is determined by investor’s need for resources (Garrison, 1991).

These three diagrammatical devices form what Garrison (1991) terms ‘capital-based macroeconomics’ which attempts to explain macroeconomic phenomena, such as business cycles, through an analysis of an economy’s productive structure. This is shown in Figure 3 below:
3.3. Effect on the Capital Structure from an Increase in Savings

Goods at the early stage of production have a payoff that is further into the future than late stages of production. Interest rates coordinate the higher and lower order goods and determine whether it is worthwhile to wait for a payoff that is in the future. A decrease in interest rate, such as that caused by an increase in savings (increased thriftiness or a decrease in time preference) will make it more worthwhile to invest in higher order activities (Garrison, 1991). This is because the discounted value of future cash flows from the asset involved in the earlier stage of production will increase when the interest rate falls (de Soto, 2009). The effect of this will be a ‘flattening’ and ‘deepening’ of the capital structure as demonstrated in Figure 4 below:
Figure 4 shows that as savings fall, profits in consumer goods industries fall due to lower present demand. These resources are shifted by entrepreneurs into sectors earning higher profits, namely earlier stages of production or higher order goods (de Soto, 2009). It is important to note that there are now more stages of production and an increased amount of capital goods. This results in a longer production process and a higher value of consumer goods in the future i.e. the economy will grow faster than previously as capital goods are more productive (Garrison, 1991).

The full effect in the economy of an increase in savings can now be analysed. In the loanable funds market we will see an increase in the supply of loanable funds (a shift right of the supply curve). This creates a new equilibrium at a lower rate of interest. There is a concurrent shift along the PPF from point A to the new point B, a point on the curve that corresponds to a lower level of consumption and a higher level of investment. As demonstrated above, the effect of this increase in savings is a lengthening and flattening of the productive structure or a shift in resources from consumption to earlier stages of production in line with profit signals. These effects are shown in Figure 5 below:

![Figure 5: Effects of an Increase in Savings](source: Garrison (1991))

Figure 6 below shows the effects on the labour market for earlier and later stages of production. As resources shift from later to earlier stages due to the fall in the market interest rate, the demand for labour increases in higher order goods sectors (to the left of the intersection of the hypotenuses) and decreases in the lower order goods sectors (to the right of the intersection of the hypotenuses) (Garrison, 1991). Initially the wage rate falls in the later stages of production while rising in the earlier stages. However, supply of labour will shift towards the higher wage rates until the difference
in wage rates is diminished. The extension of the productive structure to create new earlier stages of production also creates a new labour market. Consequently, supply and demand for labour in these sectors now intersect at a positive employment level (Garrison, 1991).

Figure 6: Labour Market Effects

3.4. Effect on the Capital Structure from Un-backed Credit Expansion

From the understanding gained by analysing how an economy responds to credit created due to an increase in savings, we can determine how an economy is affected by an increase in credit not backed by savings, that is, un-backed credit.

Figure 7 below shows how an economy responds to an increase in credit when time preference is unchanged (Garrison, 1991). This credit expansion may be caused by the issuance of loans from deposits in a fractional reserve banking system or other activities of the central bank such as changes to reserve requirements, changes to the short term discount rate set by the central bank and open market operations. These measures will be discussed in detail as they relate to New Zealand further on. Either way the driver is an increase in credit not backed by an increase in savings. The key point to take away from ABCT is that growth resulting from credit expansion by a central bank or as a result of fractional reserve banking is unsustainable. This unsustainable growth is the boom phase of the business cycle.
The increase in credit causes the interest rate in the market for loanable funds to fall from $i_{eq}$ to $i'$. The decreased interest rate makes marginal investment projects profitable thereby increasing investment. These investment projects weren’t profitable under the equilibrium interest rate as there would be insufficient demand for the goods created in the future. This increase in the level of investment causes a shift along the PPF from point A to point B, a point with a higher level of investment and a lower consumption level. However, as the credit has not arisen from a change in time preference (increase in savings) the decrease in the interest rate actually causes an increase in consumption and a decrease in savings in the present period as the return to savings has fallen. This causes an increase in present consumption from point A to point C on the PPF. Thus, we have both malinvestment and overconsumption as a result of un-backed credit creation (Garrison, 1991). This is clearly unsustainable as this point is beyond the PPF.

The increase in the supply of loanable funds without the necessary increase in savings creates a shortage in the loanable funds market. In other words, there is excess demand for savings; more people are willing to borrow at the lower interest rate than are willing to lend actual savings. This shortage distorts the economy as described above; by increasing both investment and consumption and initiating an artificial boom.
In the boom stage of the business cycle there is an unprecedented level of optimism and confidence as the factors of production can be expanded without sacrificing present consumption (de Soto, 2009). However, as the ‘kinked’ Hayekian triangle shows in Figure 5 above, there is a ‘tug of war’ for resources; both consumption and investment cannot rise for very long as it is not sustainable, ceterus paribus. The broken line in the Hayekian triangle shows that the restructuring cannot in fact be completed due to insufficient resources. At this point the economy moves from outside the PPF to inside the PPF and moves into a recession where resources aren’t being fully utilised.

As the increase in investment is brought about by credit not backed by increased savings, the unsustainable boom described above and shown in Figure 5 results in the recession stage of the business cycle. It is not necessary that the economy suffer an exogenous shock to enter a recessionary period as in theories such as real business cycle theory (Bjerkenes, Kiil, and Anker-Nilssen, 2010). The recession is imminent; once there has been an artificial boom the recession cannot be avoided.

The artificially low interest rate has misled entrepreneurs to invest in earlier stages of production. Thus, an increase in the interest rate back to the natural level will decrease the present value of higher order goods and result in the realisation by entrepreneurs that these projects were not in fact profitable. The increase in the interest rate will be caused by an increasing realisation of the scarcity of resources on the part of economic agents (Garrison, 1991). This will bid up prices and consequently interest rates (the cost of credit). Alternatively, price inflation will exceed the central bank’s targets and they will increase the discount rate. These projects are therefore wound down and the demand for labour decreases resulting in increasing unemployment, a key feature of the bust phase of the business cycle. This process of bankruptcies reallocates capital and labour according to actual preferences over a period of time. The length of this process depends both on the severity of misallocation experienced during the boom as well as the actions of the government and central bank during the recession. The unemployment observed during the bust phase of the business cycle is the result of labour no longer being demanded to the same degree in capital intensive industries. This labour must therefore shift to other sectors, often resulting in a fall in real wages.

One key observation of ABCT is that the economy will reallocate resources quicker in the absence of fiscal or monetary intervention resulting in a shorter recessionary period. The most cited case study is the difference between the little known recession of 1920-21 where the government adopted a Laissez-Faire policy and the Great Depression beginning in 1929 and ending post World War II. The Great Depression was characterised by vast public works and central bank activity (Rothbard,
One important point to note is that continued monetary intervention by central banks in response to a recession will eventually have price inflationary consequences. Credit expansion will eventually have to be halted once the inflation tolerance of the public has been exceeded. After this point a recession will once again ensue. However, due to the additional distortions caused by the extra credit expansion this recession will be worse than the original. So, if resources are unable to be reallocated and instead another boom is initiated by further artificial credit expansion, the next inevitable recession will be much more acute and cause larger welfare losses. Unfortunately, this is the policy many central banks have taken around the world in response to the global financial crises, including the Reserve Bank of New Zealand.

One important consideration is that within ABCT, the focus is on the relative prices that govern the allocation of resources over time, not the change in the price level caused by an increase in money supply (Garrison, 1991). As Rothbard (1963/2000) showed, it is possible to have a falling price level (or constant price level) and have a boom caused by distortions in relative prices. So it is not the increase in the supply of money that is the problem, it is the nature of that increase in supply and the distortions it creates to the capital structure that is of importance to the economist. Due to the natural tendency for deflation caused by productivity gains and an increase in the supply of goods, the distortionary effects of increases in the money supply in a fractional reserve banking system can still occur even with falling prices. As Garrison (1991) notes, this immediately dismisses an explanation of business cycles according to the Phillips curve as under a situation as described above, there is no inflation.

Another leading theory of the business cycle, Real Business Cycle Theory (RBCT) attempts to unite neoclassical growth theory with economic fluctuations (Sorensen & Whitta-Jacobsen, 2010). As demonstrated above, this is a similar approach as ABCT which is grounded in an understanding of how capital is formed. However, unlike ABCT, little or no attention is paid to monetary policy in instigating a business cycle (Cochrain, 2001).

According to RBCT, the business cycle is not a market failure but an efficient response to a ‘real shock,’ that is, RBCT models satisfy the conditions of fundamental welfare theorems (Ellison, 2011) and therefore business cycles are ‘optimal’. Employment fluctuations are considered to be voluntary shifts along labour supply curves and according to RBCT there is no involuntary unemployment (Sorensen & Whitta-Jacobsen, 2010). The shocks postulated by RBCT are usually described as being a positive or a negative ‘productivity shock’, a real shock as opposed to a nominal shock. Another interesting feature of RBCT is that its proponents use calibration models (equilibrium modelling) instead of econometrics to analyse its relevance and effectiveness (Ellison, 2011).
Cochrainer (200) argues that ABCT and in particular capital based macroeconomics, as put forth by Garrison (1991), can explain the period of increased investment from a positive productivity shock.

The following, as put forth by Sorensen and Whitta-Jacobsen (2010) shows how a positive productivity shock increases output according to RBCT. Output can be described with a Cobb Douglas production function as below where $K_t$ is the capital stock at the start of period $t$, $L_t$ is labour input in period $t$, $A_t$ shows ‘labour augmenting technical progress’ which essentially measures productivity of labour and $\alpha$ shows the share of capital such that $1 - \alpha$ is the share of labour:

$$Y_t = K_t^\alpha (A_t L_t)^{1-\alpha}$$

$A_t$ is the component of interest to RBCT. The growth rate of $A_t$ $(\ln A_t)$ contains the trend component $(g)$ as well as stochastic factors $(s)$ so that:

$$\ln A_t = gt + s_t$$

$s$ is the variable through which the RBCT propagation mechanism is set in motion. For example, a positive productivity shock will create a positive value for $s_t$ and result in an increase in $A_t$. Because of the increase in $A_t$, output and real incomes will increase in accordance with the production function above causing an increase in savings as savings are assumed to be a constant share of output so that :

$$S_t = s Y_t$$

This increased savings feeds into the next period’s capital stock $(K_{t+1})$ which in turn causes the next period’s output to be remain above trend, even if the positive technology shock has died out $(s = 0)$. This process continues generating ‘persistence’ in total output. Thus, a positive productivity shock has set forth a ‘boom.’

Considering ABCT, the ‘positive productivity shock’ which causes the stochastic factor, $s$, to become a positive value can be considered to be an expansion of credit not backed by savings and the subsequent lowering of the interest rate. Therefore, the positive productivity shock in RBCT may in fact be the economy’s response to credit creation (Cochrainer, 2001) which, as outlined above leads to malinvestment and a lengthening of the productive structure.
3.5. The Role of the Central Bank

In the description of the Austrian theory of the business cycle above, it is not necessary for there to be a central bank in order for there to be an unsustainable boom and bust. It is the violation of the irregular deposit contract by any bank or groups of banks which is the cause of the distortions of the capital structure. However, creation of credit from monetary irregular deposits is not a sustainable business model in a system of free banking where there is no central bank and is not viable in any long term sense. In other words, in a free market (without a central bank) the ability of banks to be involved in fractional reserve banking and to pyramid loans from deposits is severely limited by competitive factors (Rothbard, 1983/2008). Thus, any boom initiated by the issuance of loans beyond a financial intermediary’s reserves would not be long lasting and would not have the same large welfare diminishing effects of modern business cycles.

With a central bank acting as lender of last resort and guarantor of deposits however, a system of fractional reserve banking is feasible for an extended period of time. Banks can avoid bankruptcy from bank runs and other competitive factors (these will be outlined in a later section) by borrowing money from the central bank in its function as lender of last resort. In turn, the central bank can avoid recessions (temporarily) by lowering interest rates, creating additional credit and initiating another boom. Repeatedly throughout history, central banks have been created for this purpose; to facilitate lending above reserves or other inflationary and distortionary practices such as providing a buyer of government debt to finance budget deficits (de Soto, 2009). Both of these functions have inflationary effects via different routes. Firstly, by facilitating fractional reserve banking, central banks allow the creation of un-backed credit thereby expanding the money supply. Secondly, as purchaser of government bonds, the money created through central bank’s ‘open market operations’ is eventually deposited in the banking system where it then becomes a reserve which then becomes the base of un-backed credit expansion.

Not only do central banks enable banks to engage in fractional reserve banking, they also use various policy instruments to change the money supply and alter economic activity in accordance with prevailing monetary theory. Any system of fractional reserve banking will suffer from the business cycle; however the use of these instruments by central banks can magnify both the boom phase of the business cycle and the bust phase. One key take away from the Austrian analysis is that busts feed into booms. That is, that the actions of central banks during the bust phase, lowering interest rates etc., can prevent the necessary reallocation of capital and debt liquidation from occurring while also causing another boom. Therefore, the new boom begins with an already distorted capital
structure making the next bust much more severe. This will be further analysed when policy recommendations are discussed below.

The major tool of The Reserve Bank of New Zealand (RBNZ) is the Official Cash Rate (OCR). Since 1999, the RBNZ has primarily implemented monetary policy by adjusting the OCR to target a desirable inflation rate (Lawrence, 2008). The OCR determines interest rates throughout the banking system through the interbank payments system. Banks pay interest on borrowings at 50 basis points above the OCR and receive interest equal to the OCR for deposits (Reserve Bank, 2012). Thus, the banks will not lend at a rate lower than the OCR as they can deposit money with the RBNZ and receive a rate equal to the OCR risk free. Likewise, banks will compete to lend at a rate close to but above the OCR due to the need for a profit margin. Thus, the level of the OCR directly determines bank lending rates (such as the 90 day bank bill rate) and consequently the quantity of mortgage and business lending.

The RBNZ’s role then is to target price inflation, irrespective of the money supply. The monetary policy adhered to by the RBNZ assesses growth paths of both inflation and output to determine the optimal base interest rate (OCR) for the economy (Lawrence, 2008). The Policy Targets Agreement (PTA) currently sets the RBNZ’s target to keep price inflation between 1-3% on average over the medium term (Reserve Bank of New Zealand, 2012). As a rough overview of how the RBNZ uses the OCR: if inflation is higher than desired by the RBNZ, the OCR will be raised thereby decreasing the demand for loanable funds and easing inflationary pressure through less consumption and investment spending. There will also be an exchange rate effect which will serve to decrease exports as increased foreign investment increases the demand for New Zealand currency (Lawrence, 2008). Likewise, if inflation is too low according to the RBNZ, then the OCR will be decreased to spur investment borrowings and create inflation.

A low OCR will tend to lead to increases in the money supply, as measured by M2 or above, at a greater rate than a high OCR, ceteris paribus, as more credit is able to be created at lower rates. Although the two economic variables of price inflation and the money supply are positively correlated, increases in the money supply will not necessarily lead to price inflation due to other factors such as productivity improvements and a greater abundance of goods and services. As prices tend to fall due to this increased productivity, it is clear that the money supply must be inflated in order to achieve a rise in the CPI of 1-3%. The section on the application of ABCT to New Zealand will seek to determine whether the RBNZ’s actions in adhering to the PTA in fact led to distortions in the capital structure causing both the stock market and housing bubbles and the subsequent recession in New Zealand.
3.6. Criticisms of Austrian Business Cycle Theory

There are of course a number of criticisms raised by economists from various schools of thought regarding ABCT. These range from criticisms regarding the methodology of Austrian School economists to particulars of the theory. This discussion will exclude criticisms concerning Austrian methodology and focus exclusively on a few critiques of ABCT itself.

Rational Expectations Critique

In light of the rational expectations hypothesis (REH) as developed by Muth (1961), several economists have critiqued ABCT arguing that the theory requires economic agents to display a form of economic irrationality. Caplin (1997) correctly states that Austrian School economists in general understand the important role of entrepreneurs in predicting future market conditions. Why then are entrepreneurs tricked by low current interest rates into investing in higher order goods instead of correctly forecasting government and central bank policy and realising that interest rates in the future will be higher? This is an important point that has been discussed at great length in the literature. It is also perhaps the strongest criticism of the theory.

The first point to be made in response to this critique is to question the validity of the REH. Muth (1961) explains how expectations are formed by economic agents by analysing available information in the economy. A rational individual will use all available information concerning how the economy works and how government conducts policy to make future predictions (Holland, 1985). Furthermore, the REH states that the expectations of agents will be the same as the predictions of the relative economic theory with expectation errors being normally distributed and random. Is it realistic to assume all economic agents are aware of all economic information? And if these expectations are in line with the correct model of the economy, what is the correct model? There is widespread disagreement among the academia as well as the public as to which is the correct school of economic thought. For entrepreneurs to realise that credit expansion which artificially lowers interest rates will create an unsustainable boom would require widespread knowledge of ABCT.

Secondly, even if entrepreneurs understood the distortions caused by un-backed credit expansion, there still exists a calculation difficulty (Stanley, 2007). For example, suppose the price of housing increases 10 per cent over a certain time frame and the entrepreneur is aware of malinvestment towards the housing sector. How much of this 10 per cent is caused by the issuance of fiduciary media and how much is caused by demand/supply effects? Likewise, how would an entrepreneur determine the ‘natural’ rate of interest? Central bank policy throughout the world has been distorting and manipulating interest rates for a lengthy period of time (Callahan, 2006).
Finally, as Caplin (1997) acknowledges, a kind of prisoner’s dilemma game may ensue at the onset of an unsustainable boom. The boom may (potentially) be understood by entrepreneurs to be caused by low interest rates and that this will lead to increases in the prices of certain goods. It may be advantageous for an entrepreneur to invest while rates are low and attempt to ride the boom. In particular, it is marginal borrowers who may reason that the best course of action is to invest in higher order goods. Rosenthal (2012) argues that widespread knowledge of ABCT would actually exacerbate malinvestment due to the occurrence of a “harmful Nash equilibrium where the dominant strategy for entrepreneurs incentivises a collective failure.” In terms of bank lending, a bank that does not expand to the same degree as competitors risks losing market share. The problem is further compounded by the tendency for governments to bail out and financially assist banks and firms negatively affected by an economic downturn (Stanley, 2007).

Several responses have been identified to refute the charge that ABCT is not correct owing to the REH. Of these, the strongest argument is that most entrepreneurs and financial commentators are simply unaware of the distortionary effects of un-backed credit expansion. This is probably best exemplified by the raft of financial commentators who were caught by surprise by the GFC of 2008.

**Consumption and Investment**

Another criticism often cited is that as ABCT asserts that as there is over investment in the boom phase of the business cycle, there must therefore also be reduced consumption. This is at odds with what is observed, where consumption and consumer debt increases during the boom phase (Quiggin, 2009). This is essentially a misunderstanding of ABCT. As previously shown in Figure 5, there is both malinvestment and over-consumption as a result of the artificial lowering of the interest rate resulting in the economy temporarily being outside its PPF. Consumption increases as the return to saving is diminished with lowered interest rates. It is this aspect of un-sustainability that is the very cause of the bust as it is realised there is insufficient resources to finish prior investment projects.

**Why the Bust Ensues**

Yet another criticism of ABCT is that the theory doesn’t explain how the bust ensues or why the inflation that is part of the theory cannot be continued indefinitely (Tulloch, 1988).

First of all, ABCT does explain why a bust must necessarily occur following an unsustainable boom. Garrison (1991) explains that increasing realisation of the scarcity of resources bids up the price of goods, consequently increasing the interest rate causing un-backed credit expansion to cease and a bust to ensue. A boom can only continue so long as interest rates do not rise to a level to make formally marginal investments unprofitable once again. With the modern central banking practice of
inflation targeting, the recent experience has been that as soon as price inflation reaches a level above the inflation target or range, interest rates will be increased thereby ceasing credit expansion. Even without inflation targeting, public pressure from the unpopular high level of inflation may prompt tighter monetary policy. This was the experience in the United States in the late 1970s with the public growing intolerant of double digit inflation prompting the Volker Fed to hike rates (Salerno, 1986). Similarly high inflation rates were also the driving force for the passing of the Reserve Bank Act of 1989 establishing the RBNZ’s independence and sole goal of price stability (Brash, 1996).

In response to why the inflation cannot be continued indefinitely, Rothbard (1961/2009) states that continued inflationary policies which enable an ever growing in un-backed credit will be met with a decreased demand for cash holdings by the public. Cash holdings will decrease as there will be increased investment in real goods which will eventually initiate a period of hyperinflation and a flight from the currency.
4. Discussion on Empirical Investigations

ABCT was first formulated by Ludwig von Mises in the latter part of his 1912 treatise ‘The Theory of Money and Credit.’ In this work Mises built upon Carl Menger’s methodology of marginalism and subjective value, applying it to money, as well as Bohm-Bawerk’s capital theory and Knut Wicksell’s work on interest and prices. Furthermore, Mises’ formulation of ABCT can be considered an extension and improvement of the work of Hume, Ricardo and British Currency School economists. Since its formulation, ABCT has been developed further by several economists, the most influential of which being Nobel Laureate F.A. Hayek.

As compared with other economic theories, the number of empirical investigations concerning the Austrian theory of the business cycle is limited. This is partly due to the difficulty in analysing ABCT concepts empirically as well as a methodological disinclination against the use of econometric techniques amongst Austrian School economists. Having said that there are studies which attempt to validate ABCT using econometric techniques, see for example Mulligan (2006) who establishes cointegration between real consumable output and the cumulative interest rate term spread, a proxy for the real interest rate. Anker (2011) establishes an econometric link between the ratio of consumption expenditure and investment expenditure and the ratio of real GDP and natural GDP. ABCT is used by the authors to explain these relationships. Keeler (2001) also performs an empirical investigation and determines that changes in relative prices after a monetary shock, as determined in ABCT, is the main determinant of downturns in the economy. Keeler uses data for eight US business cycles from 1950 to 1991.

It is the application of ABCT to historical events which is of most interest regarding this particular research. The seminal applied ABCT work is Rothbard’s 1963 work ‘Americas Great Depression’. The Great Depression is of historical and economic significance and has been heavily studied. In this work, Rothbard analyses the 1920’s period through an ABCT lens and concludes that the recently established Federal Reserve, through its facilitation of fractional reserve banking, enabled an unsustainable boom to develop which was inevitably followed by a bust, the stock market crash of 1929 (Rothbard, 1963/2000). Rothbard’s analysis is important as it shows that even in a period where price levels remain constant; there can be credit expansion which causes distortions in the economy’s ability to align present and future consumption. ‘America’s Great Depression’ also lays the foundation in analysing policy responses to downturns by comparing the relatively brief recession on 1920-21 (caused by credit expansion used to fund World War One) and the prolonged Great Depression which lasted until the late 1940’s. The difference argues Rothbard, is that Warren Harding’s administration allowed the economy to reallocate scarce resources during the 1920-21
depression whereas those of Herbert Hoover and Franklin Roosevelt actively ‘propped up’ the economy during the Great Depression and did not allow the market to adjust according to prevailing rates of time preference (Rothbard, 1963/2000).

Rothbard also analyses several business cycles before the Federal Reserve which was established in 1913 in “The Panic of 1819-reactions and policies” and “The History of Money and Banking in the United States: The Colonial Era to World War II” which focus on monetary distortions as being the cause of the business cycle. More recently, Newman (2012) analyses the period from 1860 to 1880 arguing that the post civil war boom was allowed to develop by legislation which allowed for monetary inflation and resulted in malinvestment towards railroads and other early stages of production.

Callahan and Garrison (2003) apply ABCT to the dot-com boom and bust and conclude that the theory offers a plausible and convincing explanation to the question of what caused this business cycle; interest rates were artificially lowered resulting in un-backed credit expansion and a boom in technology stocks amongst other asset classes.

Since the onset of the global financial crisis, there have been various applications of ABCT to several economies throughout the world. The most heavily studied economy has been the United States due to its being the modern home of the Austrian School as well as its severe Federal Reserve induced boom and bust cycles. See for example Murphy (2008) who demonstrates how Federal Reserve policies initiated the ‘Great Recession.’ Eid (2009) provides empirical evidence as to the validity of ABCT before applying it to the United State’s recent boom and bust cycle and recommending an approach as to how to deal with the crisis.

Ragnarsson (2011) provides an application of ABCT to Iceland, demonstrating with economic data and analysis that Iceland went through a boom and bust cycle as indicated by ABCT. Ragnarsson uses the framework as identified by de Soto (2009) to determine exactly how the effects of un-backed credit expansion worked their way through the economy, bid up certain asset prices and inevitably result in a sharp recession with bank failures and a realignment of capital.

Bjerkenes, Kiil, and Anker-Nilssen (2010) apply ABCT to Norway and find that the theory is suitable in explaining business cycles in Norway from 1970 to 2009. Bjerkenes, Kiil, and Anker-Nilssen also provide recommendations as to the correct policy response when the economy is in recession as well as policy recommendations to prevent the onset of recessions. These recommendations are summed up as ‘Laissez-Faire’.
5. Application of Austrian Business Cycle Theory to New Zealand

In order to determine whether New Zealand’s recent experience of the business cycle can be explained by ABCT, several variables need to be analysed. The Austrian theory of the business cycle as outlined above provides a guide as to what one would expect key economic variables to indicate. The economic variables of interest will be examined over two key phases of the business cycle; the expansion and the bust/recession.

It is important to remember that a particular historical episode such as New Zealand’s recent boom and bust having characteristics similar to those predicted by ABCT does not in itself validate ABCT. The only way to completely validate an economic theory is through deductive reasoning stemming from certain truths regarding human action (Mises, 1949/1996).

5.1. Expansion

During the expansion or boom phase of the business cycle, according to ABCT there are several features that should be observed. Firstly, there should be an increase in the money supply as un-backed credit is created. This un-backed credit, as demonstrated above will cause the interest rate to fall below its natural level, thus causing a decrease in the rate of savings on the part of households. As more investment projects are undertaken we should witness an increase in the price of goods of the higher order or earlier stages of production. Such asset markets to consider are the market for housing and the stock market.

Money and Credit
In order for the Austrian framework to apply to New Zealand’s recent boom and bust we must observe an increase in credit resulting in both malinvestment and over-consumption in various economic sectors.

The first question to ask is; was there un-backed credit creation? That is to say, was credit created that was not backed equivalently by an increase in savings? In order to determine whether this occurred we will need to analyse several key variables.

Money supply is a critical variable to consider for ABCT and is largely ignored by other theories of the business cycle. There are several money supply measures which include various forms of money and credit. M1 is the narrowest measure of money supply widely used and reported by the RBNZ and includes cash and transaction account balances which can be readily used to settle transactions (New Zealand Banker’s Association, 2006). M2 is defined as M1 plus other funds on call such as savings accounts etc. (Reserve Bank of New Zealand, 2012b). M3 is the broadest money supply
measure and is perhaps the most relevant monetary measure for our purposes as it all forms of New Zealand dollar funding which can be used to invest in earlier stages of production and bid up asset prices.

Charts 1 below shows the stock of the M2 and M3 money measures for New Zealand from 2000 to the present day. The chart displays a marked increase in money supply. M2 has increased from a stock of $41,490m in January 2000 to $94,677m in September 2012. This is an increase of 128% or approximately 10% per year. M3 has increased from $96,182m in January 2000 to $245,502 in September 2012 (Reserve Bank of New Zealand, 2012c). This is an even bigger percentage increase than M2 at 155% or an annual rate of approximately 13%. The observed increases in the money supply indicate that the RBNZ’s targeting of the OCR has resulted in some degree of monetary inflation.

**Chart 1: M2 Money Supply**

However, while M2 and M3 have clearly grown at a fast rate over the previous 12 years, it is the growth rate of the money supply directly preceding the bust that is of most interest. M2 grows at a very quick pace preceding the onset of the GFC in 2008. Chart 2 shows that from 2005 to 2007, the growth rate in the money supply shows a very strong upwards trend. In fact, in September 2006 M2 grew at an annualised rate of 20.6% (Reserve Bank of New Zealand, 2012c). The sharp increases in M2 after 2008 are the result of activities by the RBNZ to attempt to ‘stimulate’ the economy the consequences of which will be discussed later. The sharp increase circa 2001 is once again a policy response by the RBNZ to a previous recession which fed into the current economic crisis. Following
the onset of the GFC, there is a sharp decrease in the rate of growth in M2 with money supply (as measured by M2) actually falling as the rate of default increases.

Chart 2: M2 Year on Year Growth Rate

Source: Reserve Bank of New Zealand (2012c)

Chart 3 shows the year on year growth rate in M3. Immediately noticeable is that M3 shows much less volatility than M2. This is to do with the fact that M3 is the broadest measure of money used by the RBNZ (Reserve Bank of New Zealand, 2012b). However, the same trend is evident; a high rate of growth in the years directly preceding the onset of the GFC followed by a fall in the money supply growth rate followed by an increase as the RBNZ enacts monetary policy measures.

Chart 3: M3 Year on Year Growth Rate

Source: Reserve Bank of New Zealand (2012c)
Chart 4 below shows mortgage and other lending by registered banks over the previous 12 years. As with measures of the money supply above, bank lending shows a marked increase in the period prior to 2008. In fact, from March 2005 to September 2008 mortgage lending increased from $102 billion to $155 billion while ‘other’ lending increased from $90 billion to $130 billion (Reserve Bank of New Zealand, 2012d). Other lending is defined as “loans and advance excluding mortgages” (Reserve Bank of New Zealand, 2012d). The rate of bank lending then slowed considerably after 2008 in response to the financial crisis. It is this increased lending which allows the money supply (M2 and M3) to grow at the rate observed above owing to the process of money creation in the economy.

Chart 4: Registered Bank Lending

Source: Reserve Bank of New Zealand (2012d)

Chart 5 below indicates that the expansion in the money supply and bank lending placed upward pressure on price inflation as measured by the consumer price index (CPI). The CPI is the primary measure used by the RBNZ to determine the price inflation and therefore has a direct bearing on whether or not the OCR will be changed. In the period prior to 2007 the CPI was at or above the 3% upper limit as outlined in the policy targets agreement (PTA). CPI began to fall again in 2007 in line with the slowing of the rate of growth in the money supply shown in Charts 1-3 above.
As mentioned previously, the aim of the RBNZ is to keep inflation between 1-3% on average over the medium term. The main policy instrument used to do this is the OCR which influences bank lending rates as shown below in Chart 6. An increasing OCR would therefore indicate price inflation threatening to break through the upper bound of the PTA of 3%. An increasing OCR is therefore consistent with the increase in the supply of money witnessed above.

The OCR and 90 day bank rate can be examined to determine whether interest rates are set too low by the RBNZ. Artificially low interest rates exacerbate the distortionary impacts of fractional reserve banking on the productive structure of the economy. However, it is impossible to determine what the natural market rate of interest is that should prevail on the market at any time. This is because the social rate of time preference can only be observed through market interactions, the market for loanable funds which is not being allowed to reach a market clearing rate.

The key point is that the evidence indicates interest rates were initially set too low by the RBNZ which resulted in increased bank lending thereby resulting in increases in the money supply. This increased supply of money resulted in higher price inflation forcing the RBNZ to increase the OCR to attempt to slow the rate of money growth and consequently price inflation.
The evidence suggests that the period preceding the onset of the bust phase of the business cycle was a period of expansion in the money supply. As money is created through the banking system in the form of loans, this was a period of credit expansion with banks lending large amounts to firms and businesses.

Savings
The question then becomes was this credit expansion backed by savings? As the overview of ABCT detailed in previous sections shows, credit expansion backed by savings will change the productive structure of the economy to reflect the new social level of time preference (Rothbard, 1962/2009). This increased level of savings will result in a flatter Hayekian triangle and a longer productive process yielding a larger amount of consumer goods in the future. Thus if savings increase, credit will increase resulting in enhanced investment and decreased consumption and consequently a faster growing economy. However, if this credit is not backed by an increase in savings an unsustainable boom will occur featuring both malinvestment and over-consumption.

Therefore, if this boom is to be considered an unsustainable boom in line with ABCT, we would expect to observe in the New Zealand economy during the expansion phase of the business cycle a decrease in the savings rate and an increase in consumer debt. Not only is there malinvestment from artificially lowered interest rates according to ABCT but there is also over-consumption as the return to savings falls and consequently less is saved. Consumer debt also increases as consumer loans now
have a lower rate of market interest, and a consumer with time preference unchanged will borrow to consume more in the present.

The savings rate for New Zealand has been of concern to the government for quite some time (Savings Working Group, 2011). International Monetary Fund (IMF) data for 2010 indicate that New Zealand ranked 95th in the world in terms of gross savings as a percentage of GDP (Economy Watch, 2012). It is very tricky to analyse savings data as it is a very complex statistic to collect. The Savings Working Group (2011) displays several graphs of New Zealand’s savings rate over the last decade, a minority of which suggest savings actually increased over this period. Nonetheless, the consensus is that New Zealand’s savings rate fell during the 2000’s boom with households only recently saving more than they borrow (Stuff, 2011).

Chart 7 below shows a moderate decrease in the rate of gross domestic savings as a percentage of GDP in New Zealand in the period prior to 2008. The rate of gross savings falls from above 20% prior to 2003 to as low as 15.7% in 2007.

Chart 7: Gross Domestic Savings as a Percentage of GDP

![Chart 7: Gross Domestic Savings as a Percentage of GDP](image)

Source: International Monetary Fund (2013)

Chart 8 details the same trend as observed by the IMF data contained in Chart 7 and breaks down savings by sector. Chart 8 shows that both business and consumer saving decreased significantly prior to 2008 with household savings reaching -5% meaning household debt outweighed savings. Household savings has only just recently ‘returned to the black’ in 2011 (Stuff, 2011). Chart 9 shows gross and net household savings as a percentage of disposable income. There is a clear downward trend in the years prior to the recession which is compatible and as predicted by ABCT.
De Soto (2009) states that during the expansion phase consumption expenditure will not decline. Chart 10 below shows total household consumption expenditure. This clearly shows consumption expenditure increasing in the period leading up to 2008, the expansion phase. This is line with the decreased savings rate and increased household debt as described above.
Higher Order Goods
There are several features of the economy and various market processes that can be used to identify the presence of an unsustainable boom as a result of artificial credit creation. ABCT asserts that during the expansion phase there will be a general lengthening of the productive structure with malinvestment towards higher order goods or goods involved in earlier stages of production (Garrison, 1991). In addition there will also tend to be investment towards durable consumer goods (Karlsson, 2008). Durable consumer goods are goods, the consumption of which will occur over a period of time. Just as capital goods aim to produce consumption in the future, so too do durable consumer goods. Durable consumer goods, such as cars and houses, can thus be considered as a form of higher order goods. The purchase of durable, just like investment in capital goods, requires the sacrifice of present consumption with the expectation of enjoying greater consumption in the future (Rothbard (1962/2009). They are often bought on credit and are influenced by interest rates. Therefore, low interest rates will induce increased investment in durable consumer goods. We should consequently see proportionately large increases in the prices and value of these assets.

As shown in Chart 11, between 2002 and 2008 the value of New Zealand’s private sector residential dwellings increased from approximately NZ$250 billion to over $600 billion (Reserve Bank of New Zealand, 2012). This is an increase of over 140%, or an annualised growth rate over the period of around 20%. The value of housing stock is however not a perfect measure of whether this sector is being distorted by artificial credit creation as it shows both real effects (increased demand for
housing from population growth etc.) and distortions from credit expansion. However, such a sharp increase in the value of housing stock is in line with the predictions derived from ABCT.

Chart 11: Value of Private Sector Residential Dwellings

Source: Quotable Value Limited, RBNZ estimates

The NZX50 (Chart 12) also experienced significant gains over this period increasing from 2600 basis points in 2004 to over 4200 by 2008 (Yahoo Finance, 2012). This is an increase of 61% or an annualised rate of over 15%. In comparison, the consumer price index (CPI) widely used by the RBNZ and others as a proxy for price inflation, experienced annual growth rates between 1-4%.

Chart 12: NZX 50 Index

Source: Yahoo Finance (2012)
The capital goods price index (CGPI) as shown in Chart 13 measures the changes in capital goods and displays a moderately strong and consistent rise in the prices of capital goods from around 2005 until 2008 before sharply decreasing in response to the GFC.

The Producer Price Index (PPI) also shows significant gains in the period leading up to 2008 as displayed in Chart 14 below. The PPI measures the price of inputs and outputs for producers. The large increases shown below, in addition to the CGPI as shown above, provide further evidence that the prices of capital goods are being bid up by malinvestment towards earlier stages of production.

Note: the CGPI is showing the annual percentage change whereas the PPI shows the index level.

Source: Interest.co.nz (2012)
Summary of Expansion Phase
There is evidence that there was a period of un-backed credit expansion in the years preceding the onset of the GFC in 2007-2008. The chief instigator was the setting of interest rates artificially low i.e. below the market rate of interest where supply of loanable funds equals demand. These low interest rates, in combination with the inherently inflationary system of fractional reserve banking, resulted in large increases in bank lending and consequently in the money supply. This credit expansion resulted in increasing prices in capital goods sectors, most notably in stocks and housing and put upwards pressure on price indexes such as the CPI, CGPI and the PPI.

5.2. Bust
The period in which it becomes clear that the expansion phase of the business cycle was unsustainable is the bust phase. During this phase there is market realisation that there is a scarcity of goods; both malinvestment and over-consumption cannot continue indefinitely (i.e. the economy cannot operate outside the PPF indefinitely).

Money and Credit
What is the trigger of this bust phase? In economies where money supply is ultimately determined by the actions of a central bank, the trigger can be found in their actions, particularly in response to rising price inflation.

As outlined above as shown in Chart 6, the OCR set by the RBNZ continued to increase from 2004 to 2008. In accordance with the PTA, the OCR was raised in order to keep the CPI, the measure of price inflation, within the 1-3% growth rate range. These hikes in the OCR continued in response to price inflation which continued to threaten to break above the 3% upper bound with several quarters experiencing a rise in the CPI greater than 3%. Over this period the money supply continued to grow significantly with M3 increasing by over 15% in 2007.

The OCR continued to increase market interest rates until the point was reached where the interest rate was high enough to halt the process of credit expansion. Chart 2 above shows that the growth rate in M2 was negative for the second half of 2007 and the early part of 2008 while the growth rate in M3, as shown in Chart 3, also slowed significantly from late 2007 onwards. This increase in the OCR coupled with the contraction in the M2 money supply and slowdown in growth of M3 money supply set in motion spontaneous market processes culminating in the bust phase of the business cycle as outlined by ABCT.

During this bust phase, the contraction in credit and the money supply reveals that the investment towards higher order goods, such as housing and the stock market, was not justified by the
prevailing rate of time preference in the economy. Therefore, as outlined in previous sections, a period of reallocation of resources begins whereby capital and labour shift to their highest value use according to this social rate of time preference.

**Bankruptcies**
As shown in Chart 15 below, the rate of bankruptcies in New Zealand significantly increased between 2007 and 2008 from around 300 per month to around 550 in 2008 to a peak of 658 in September of 2009. This is in line with ABCT which predicts that as sectors involved with earlier stages of production become less profitable due to higher interest rates, resources will tend to shift towards earlier stages of production through the process of bankruptcy. The rate of monthly bankruptcies shows a decreasing trend since 2009 which indicates that perhaps the reallocation process is nearing completion or that monetary stimulus is causing continued malinvestment and therefore reduced bankruptcies.

**Employment**
Labour is another resource that according to ABCT is misallocated during the expansion phase of the business cycle and must necessarily be reallocated during the bust/recession phase. Increasing unemployment from 2008 would indicate this market process is occurring. Persistent unemployment however indicates that government policy is not enabling the real wage to fall to a market clearing level and labour reallocated to its highest value use according to the social rate of time preference.

Chart 16 shows the unemployment and employment rate since 2008. This shows a sharp increase in unemployment since the beginning of the recession from around 4% to above 7% at present. Of
most concern is the fact that unemployment is continuing to increase even in 2012, several years after the beginning of the recession indicating that labour is unable to be reallocated appropriately.

Chart 16: Unemployment and Employment Rates

Summary of Bust Phase
The successive raises in the OCR observed over the period of the expansion phase eventually lead to a slow down and decrease in lending and consequently the rate of growth of the money stock falling. When this occurred, the New Zealand economy entered the bust phase of the business cycle where market processes attempt to reallocate resources according to the prevailing social rate of time preference. Subsequently, both unemployment and the rate of bankruptcies were observed to increase as these resources shift from sectors made relatively more attractive by the preceding credit expansion.

Summary of Empirics
In summary, the evidence appears to conform to an ABCT explanation of New Zealand’s recent boom and bust. There was an unsustainable boom fuelled by credit expansion un-backed by savings. This credit expansion and the corresponding increases in the M1 and M2 money supply measures were initiated by an OCR that was maintained at a rate below the market rate of interest, that is, a rate where the supply of loanable funds equals demand for loanable funds. Accordingly, there was a period of malinvestment towards housing and stocks as the productive structure of the New Zealand economy was distorted as described in the framework above. Eventually, owing to increasing price inflation as evidenced by the CPI, the OCR was raised to such a point so as to cease credit creation and reveal the malinvestment that had occurred. This cessation of credit caused sharp drops in the prices of higher goods, most notably housing and stocks, while increasing the number of bankruptcies and raising the rate of unemployment.
6. Policy Recommendations

There are two main areas in which the theory and application of the theory contained in this paper have implications for New Zealand policy makers. The first concerns the optimal monetary and fiscal policy to pursue upon the recurrence of a recession. The second concerns policy recommendations to avoid recessions in the future.

6.1. Policy Recommendations in a Recession

The appropriate fiscal and monetary policy measures to pursue in the instance of a recession are a highly contentious issue. Some prominent economists argue that the central bank should ‘ease’ monetary conditions (lower interest rates) to ‘stimulate aggregate demand.’ Some also argue that governments should undertake public works projects and jobs programmes to ease the unemployment problem and take advantage of a multiplier effect (Mankiw, 2007). ABCT however supports a different conclusion as to the best course of action; Laissez-Faire.

ABCT postulates that the recession is the process whereby the market attempts to reallocate resources according to prevailing time preference in the economy. During this time there will be a period of idle resources and unemployment as resources and labour shift from sectors favoured by the monetary distortions to other sectors according to the prevailing rate of time preference. As loan repayments decrease (bankruptcies increase) and consequently the money supply shrinks (the money supply was initially expanded as a result of un-backed credit expansion) this should also be a period of falling prices.

As the ‘cure’ to the recession is to let the market reallocate resources to where they are best suited and are of the most value, any governmental policy which inhibits the market’s mechanism will cause the recession to be more prolonged and cause increased welfare losses. Thus policy which aims to stop falling prices and wages or attempts to prop up failing companies or sectors will limit the reallocation process, raise unemployment and increase the time of the recession. As Rothbard (1969/2009 pp. 39) states; “Doing this (bailing out firms) will simply prolong the agony and turn a sharp and quick depression phase into a lingering and chronic disease.” Furthermore, efforts to boost consumption such as increased government spending or increased transfer payments will exacerbate the problem. Government spending, either financed by taxes or borrowing, further decreases savings available for productive activity and therefore result in greater distortions and welfare losses.

In terms of monetary policy, the problem of the recession cannot be solved by injections of more credit as this increased credit causes interest rates to fall further than they naturally would have and
leads to further malinvestment in higher order goods thereby preventing their necessary liquidation. In addition, if the reinflation succeeds and enough credit is in fact added, another boom may occur which will inevitably result in an even larger recession in the future (Rothbard, 1969/2009). Many commentators in fact view the GFC as the culmination of thirty or forty years worth of distortions caused by un-backed credit expansion with each recessions monetary policy response, such as the low interest rates in the United States following the dot-com crash, feeding into the next boom.

Rothbard (1963/2008) describes the fact that prior to 1929, even if government policy which enabled fractional reserve banking and so forth created unsustainable booms, the government did not interfere with the economy during recessions. Consequently, the recessions prior to the Great Depression were usually short and sharp. The depression of 1920-21 for example saw a large deflation of the money supply and little ‘expansionary’ fiscal or monetary policy and was over relatively quickly (de Soto, 2009). This policy changed during the Great Depression however where, even before the New Deal programmes of 1933, Herbert Hoover intervened in various areas of the economy primarily preventing prices (particularly agriculture prices) and wages from falling and capital and labour reallocating (Rothbard, 1963/2008). Consequently, the Great Depression persisted for over a decade finally ending after the Second World War.

So in order to minimise social welfare losses and enable economic recovery, the New Zealand Government and the RBNZ should cease all policy which limits the ability of previously distorted resources to be reallocated. The RBNZ in particular should not delay reallocation of resources or encourage further malinvestment by setting an historically low OCR. We will see in the next section that in fact the rate of interest should be allowed to be set by market participants according to their value scales and time preference.

6.2. Policy Recommendations to Avoid a Recession: A System of Free Banking

This paper has detailed how an expansion of credit which isn’t backed by savings leads to distortions in the productive structure of an economy resulted in an unsustainable boom and an inevitable bust. Therefore, in order to prevent future recessions, policy changes must be made to ensure that unsustainable booms fuelled by un-backed credit expansion are not allowed to develop. In particular this will require reform of New Zealand’s financial system towards a system of banking in accordance with traditional legal principles; a system of free banking.

A system of free banking is defined as a system where banks are treated like any other business on the market (Rothbard, 1983/2008). That is, they are not subject to additional government
regulations and there is no central bank to act as lender of last resort and provide liquidity to banks which have over-extended themselves by keeping on reserve less than 100 per cent of deposits. In such a system, the medium of exchange (the money) is chosen by market participants due to its advantageous characteristics such as being divisible, non-perishable and durable (Rothbard, 1962/2009). This has historically been gold and silver but this cannot be determined a priori. Thus, the role of banks is either to a) provide safekeeping (the monetary irregular deposit contract) or b) act as an intermediary between savers and borrowers (the loan contract).

The activity of fractional reserve banking under free banking is a contentious issue amongst economists, especially amongst economists of the Austrian School. Some consider fractional reserve banking and the violation of the irregular monetary deposit contract as a breach of ‘traditional legal principles’ and therefore fraudulent. These economists seek for fractional reserve banking to be considered illegal (de Soto, 2009), (Rothbard, 1983/2008). Others see fractional reserve banking as not inherently fraudulent but recognise the destabilising effects of excessive credit growth in line with ABCT. These economists also advocate a system of free banking and its inherent competitive factors outlined below as a means to limit credit expansion.

As mentioned, free banking, even in the absence of laws prohibiting fractional reserve banking, provides competitive factors that limit credit expansion. The first such competitive factor is the famed bank run. A bank run occurs when the customers of a given bank lose confidence in the ability of the bank to redeem their money on demand (Rothbard, 1983/2008). These customers then demand redemption of their bank receipts from the bank. As other customers hear about the potential of the bank being unsound, the run intensifies. If indeed the bank is unsound (has engaged in fractional reserve banking) then the bank will be bankrupt and forced to close its doors. This mechanism provides a disincentive for banks to engage in fractional reserve banking with banks doing so (and thereby distorting the productive structure) will eventually be put out of business. As the discussion of the role of the central bank previously alluded to, central banks act as lenders of last resort. So in a financial system with a central bank providing liquidity, commercial banks are not subject to this competitive factor as they can simply borrow (newly printed or newly created) money from the central bank.

A bank run only occurs after the customers of a bank lose confidence for whatever reason in the bank. This occurs once and can unfortunately often occur after significant un-backed credit expansion. There is also a mechanism that may bankrupt a bank without any loss of confidence occurring whatsoever and therefore limit the practice of fractional reserve banking. This is where customers of other banks, or the other banks themselves, call upon the fractional reserve bank for
redemption (in gold or government paper). If the fractional reserve bank does not have the deposits on hand to redeem its bank notes then it will be bankrupt and unable to inflate any further (Rothbard, 1983/2008).

These competitive measures show that, even when fractional reserve banking is not considered as fraudulent, the practice of extending un-backed credit will be limited and therefore the distortionary effects on the productive structure which create the business cycle will be reduced. Far from a system of free banking causing widespread inflation, such a system would be significantly more stable than one operating with a central bank enabling fractional reserve banking.

It is the opinion of this author that, in line with de Soto (2009) and Rothbard (1983/2008), that there should be a 100 per cent requirement for both note issues and demand deposits in New Zealand. This will restrict the practice of fractional reserve banking preventing the business cycle by limiting credit growth which distorts the temporal productive structure of an economy. Furthermore, as the RBNZ acts as lender of last resort and issues fiduciary media which allow excessive credit expansion to occur, the disbandment of the RBNZ would ensure that commercial banks are subject to the competitive factors outlined above and keep on reserve 100 per cent of deposits.

Not only does the RBNZ act as lender of last resort thereby facilitating fractional reserve banking, as mentioned earlier it also uses various measures to enact monetary policy. Such measures as the manipulation of the OCR, the purchase of government debt or the lowering of reserve requirements add to the credit expansion and the subsequent malinvestment and over-consumption characteristic of the boom phase of the business cycle. Preventing such distortionary monetary policies will reduce the likelihood and severity of recessions occurring in the future.
7. Conclusion

Austrian Business Cycle Theory (ABCT) posits that an expansion of credit which is un-backed by savings leads to distortions in the productive structure of an economy and results in an unsustainable boom. During this boom there will be both malinvestment and over-consumption as interest rates fall below the market clearing level. In particular, there will be malinvestment towards goods of the higher order such as stocks and construction. Un-backed credit expansion is only made possible when a financial intermediary lends out an amount greater than the deposits they have on hand. This is fractional reserve banking and a violation of the monetary irregular deposit contract and counter to traditional legal principles. Such practices are aided by a central bank that acts as lender of last resort thereby enabling credit expansion while mitigating the competitive factors that would limit such practices in an unhampered market.

The unsustainable boom must eventually come to an end. This happens when the rate of credit expansion slows or ceases and correspondingly the interest rate rises. In an economy managed by a central bank, this process usually occurs when the base interest rate, such as the Official Cash Rate (OCR), is raised in order to keep inflation within a prescribed target range. Whichever way the bust ensues, spontaneous market factors will seek to reallocate previously misallocated resources to their highest use. The economy can only begin its recovery if market forces are able to reallocate resources accordingly.

The question is then whether New Zealand’s recent boom and bust is consistent with, and can be explained by, ABCT. In order to determine this, an analysis of relevant economic information is undertaken in light of ABCT with observed phenomena explained with reference the theory as outlined above.

Preceding the onset of the recession, New Zealand experienced a large growth in the money supply as measured by M2 and M3 as well as large increases in bank lending (credit expansion). In fact, in September 2006 M2 grew at an annualised rate of above 20%. Between 2004 and 2008, bank lending in the form of mortgages and business loans grew by over 50%. The observed credit expansion was fuelled by the OCR being kept at a level below the market level as determined by savings and demand. Over this period, the rate of savings fell, ensuring the observed credit expansion was not backed by a decrease in time preference and more savings. This credit expansion resulted in large increases in the prices of housing and stocks with housing prices, increasing by 17.5% per year between 2002 and 2008.
As price inflation, measured by the consumer price index (CPI) threatens to grow at a rate higher than the range desired by the Reserve Bank of New Zealand (RBNZ), the OCR was raised in order to lower inflationary pressure. This happened repeatedly between 2004 and 2008 until interest rates reached a level at which the rate of credit expansion and money supply growth slowed. This initiated the bust phase of the business cycle from which the New Zealand economy is still recovering. The bust phase saw a sharp drop in the growth rate of housing prices and a severe decrease in the value of the NZX50. Also observed was a doubling in the rate of bankruptcies as resources were reallocated and a large increase in unemployment.

There are several policy recommendations that are made as a consequence of this analysis. Firstly, when a recession does occur, the best response for policy makers is to allow resources to be allocated to their highest value use in line with the prevailing rate of time preference in the economy. Any policies which prevent this spontaneous reallocation will only serve to prolong the recession and increase the associated welfare losses. Thus, the RBNZ should not attempt to lower interest rates during a recession but should allow a market rate of interest to be determined. Lowering interest rates once again will prevent reallocation and if successful in staving off the bust will enhance malinvestment making the next recession worse.

Secondly, in order to prevent booms and busts from occurring in the future, changes in policy must limit the ability of banks to expand credit without a corresponding increase in savings. In other words, the facilitation of fractional reserve banking must cease. Such a system can be described as a system of free banking where banks and other financial intermediaries are subject to the same laws and regulations as other commercial enterprises. Such a system necessitates the disbandment of the RBNZ as having a central bank acting as lender of last resort limits the competitive factors which prevents un-backed credit expansion. Examples of such competitive factors are bank runs and redemption of bank notes by other banks in excess of reserves.
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