



**MS-Thesis**  
**Corporate Finance**

**Austrian Business Cycle Theory**  
Did Iceland go through an Austrian Business Cycle?

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Advisor: Ársæll Valfells  
Business Administration  
February 2011



**HÁSKÓLI ÍSLANDS**

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Final Assignment for MS-degree in Business Administration

Advisor: Ársæll Valfells

Business Administration

School of Social Science University of Iceland

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Austrian Business Cycle Theory – Did Iceland go through an Austrian Business Cycle?

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## **Preface**

This is a 30 ECTS credit thesis for a masters' degree in Business Finance at the University of Iceland. It was written under the supervision of Ársæll Valfells, Assistant Professor in School of Business at the University of Iceland.

## **Abstract**

The question this research tries to answer is if an artificial credit expansion caused the Icelandic economy to go into an Austrian style business cycle in the first decade of this century. To answer that question data from the Statistic of Iceland and the Central Bank of Iceland will be studied. The period that will be looked at is the years from 2001 until 2010.

The framework that is used is taken from Jesús Huerta de Soto's book "Money, Bank Credit, and Economic Cycles", in that book de Soto lays out a framework that can be used to find empirical evidence of an Austrian business cycle. The boom and bust cycle is broken up into different stages; scenarios which the economy would go through under each stage are listed. In this research economic data are shown graphically under each stage to try to see if the economy went through the different scenarios the Austrian Business Cycle Theory predicts it would go through under an artificial credit expansion.

The evidence shows that there was an artificial credit expansion in Iceland, credit increased while saving in the economy decreased and households were spending more. That caused the productive structure to lengthen and capital goods to rise in prices and there was also a boom in the stock market. After the expansion of credit ceased the stock market crashed and capital goods fell in prices and those operating in long term projects, like housing construction, made losses. Therefore the conclusion can be made that the Icelandic economy did indeed go through an Austrian style business cycle.

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## 1 Introduction

After the fall of Lemman Brothers in 2008 and the following financial crisis, or credit crunch, many explanations for the troubles the financial world found itself in have emerged. Explanations ranging from financial deregulation to greedy bankers have been said to be the cause for the recession facing countries all over the world. One school of thought stands out in its explanation of the global recession and that is the Austrian School of Economics. Their explanation is that artificially low interest rates and credit expansion, created by central banks, caused an unsustainable boom that eventually must turn into a bust.

Years before the fall of Lemman Brothers many Austrian economists in America had been warning about the bursting of the bubble they believed their economy was in. They claimed that the low interest rate set by the Federal Reserve, after the bursting of the internet bubble in 2000, had created an artificial boom, in housing among other things. They were warning that the longer the credit expansion was allowed to go on the harder the following recession would be. They were mostly ignored or even laughed at.

Peter Schiff was one of those economists that were warning about a coming crash for years before it happened. He made regular television appearances where he warned about subprime mortgages, a housing bubble, financial institutions getting in trouble and overall phony economy. He was mostly laughed at but after watching his television appearances, going back years before the recession hit, you could see that almost everything he said came through. Peter's were not after the fact explanations, he was warning about the crash before it happened. His reasoning made more sense to me than those explanations made after the crash by people that did not see it coming.

Since Austrian economics are not taught in the University of Iceland I had never been exposed to the Austrian Business Cycle before but wanted to learn about it. After having read books about Austrian economics, some written in the first half of the last century, its business cycle theory seemed to fit to what had happened in the years leading to the current crisis. That is where the idea for this research came from; after having read

books on the Austrian Business Cycle and watching Peter Schiff predicting the coming bursting of the bubble economy, I thought, could it be that Iceland went through an Austrian style business cycle.

If it should be that the economy followed the path of the Austrian Business Cycle Theory it would suggest that the economy was on an unsustainable path before the banks went bankrupt in 2008. The recession would have hit Iceland when access to cheap credit would have stopped, even if the banks had not gone under. The Icelandic economy would have needed a reconstruction, irrelevant of the banking system failure. Therefore this research is not about the financial system and the fall of the banks, it's about the boom period in the years leading up to the fall of the banks.

If an empirical research would show that the economy went through an Austrian style business cycle it would stand to reason that the Austrian economist saw the crisis coming since they were applying economic data to the Austrian theory. What intrigued me was to see if easily accessible data could be used to answer this question. If that kind of data could spot an Austrian Business Cycle everybody how understood the theory could see if the economy was on an unsustainable path. Then an in depth analyses by expert economist with their sophisticated models would not be needed to spot a business cycle.

The question how to conduct such a research was not an easy one to answer since not many empirical researches have been made on the Austrian Business Cycle Theory. It was not until I read Jesús Huerta de Soto's book "Money, Bank Credit, and Economic Cycles" that the answer was found. In his book de Soto lays out a framework that can be used to find empirical evidence of an Austrian business cycle. That framework is used in this paper to show if the Icelandic economy went through an Austrian business cycle or not.

The structure of this paper is as follows; in chapter two the Austrian School of thought is introduced. First a brief overview of the main Austrians and then an Austrian explanation of some concepts that is important to understand their business cycle theory. Then the Austrian Business Cycle Theory is explained in details. The second chapter ends with a graphical view of the business cycle, that part is based on the book "Time and Money – The Macroeconomics of Capital Structure" by Roger W. Garrison.

In chapter three the hypothesis of this thesis is laid out and the execution of the research explained. The research is put forward in chapter four; there statistics from the Icelandic economy are shown in graphs to try to find out if the Icelandic economy went through an Austrian style business cycle in the first decade of this century.

Conclusion from the research is made in chapter five.

## **2 Austrian School of Economics**

The Austrian School of Economics gets its name from its founders who were from Austria, notably Carl Menger, Eugen von Böhm-Bawerk and later Ludwig von Mises and Friedrich Hayek. To be considered an Austrian economist, one does not have to be from Austria because the Austrian School of Economics is a school of thought and its members are identified with it through their shared ideas not a geographical location.

What sets the Austrian School apart from other schools of thought in economics is that they reject mathematical modeling of the economy and instead focus on the individuals and interactions between them. Austrians argue that people are rational beings that make decisions based on incentives, and by studying human action they can better understand the economy than a mathematical approach could manage.

Austrian economists advocate a free market economy and limited government, a laissez faire approach. They argue that government interference in the market distort it and creates unforeseen consequences, especially damaging in their opinion is government monopoly in money production and central banks. According to the Austrians, governments or central banks manipulation of the money supply causes the business cycle and creates booms and busts. Instead they advocate full reserve or free banking and the abolition of all legal tender laws. They also advocate a return to sound money, commodity money, not necessarily gold or silver but they believe that those are the commodities that the market would choose.

### **2.1 Austrian Economist**

#### **2.1.1 Carl Menger**

Carl Menger (1840-1921) founded the Austrian School of Economics in Vienna in the latter half of the 19<sup>th</sup> century. In his book “Principles of Economics” Menger addressed the goods, value, and price theories of the German economists, supplementing and developing them further (Schulak, Unterköfler, p. 14, 2011). In this book Menger came up with the “marginal utility theory” to explain value of goods.

In “The Origin of Money” Menger explains how money originates on the market, individuals decide what is the most marketable good and start to use it as medium of exchange. Money is therefore not a creation of government but a market creation.

### **2.1.2 Eugen von Böhm-Bawerk**

Eugen von Böhm-Bawerk (1851-1914) was a disciple of Menger and later a mentor of Ludwig von Mises.

In the book “Positive Theory of Capital” Böhm-Bawerk laid the foundations for an Austrian theory of capital and interest and also made a critical contribution to the international reputation of the Austrian School (Schulak, Unterköfler, p. 34, 2011).

### **2.1.3 Ludwig von Mises**

Ludwig von Mises (1881-1973) is notably the most famous of the Austrian economists and his book “Human Action” was a comprehensive treatise on economics and is still today the foundation which the Austrian School stands on. In Auburn Alabama there is an institution dedicated to Austrian economics which is named after him, The Ludwig von Mises Institute.

In his book “Theory of Money and Credit” he integrated the theory of money with the marginal utility and price. Also in that book he lays down a theory of the business cycle which is caused by credit expansion by the government and the central banking system.

### **2.1.4 Friedrich Hayek**

Friedrich A. von Hayek (1899-1992) was a disciple of Mises and he was awarded the Nobel Memorial Prize in Economics Sciences in 1974 for his work on the business cycle theory. Hayek build on the works of Mises and further developed the business cycle theory, how it is caused by credit expansion and the malinvestments that are undertaken in the economy following the expansion.

Hayek left Austria in the 1930s and took up professor tenure at the London School of Economics. There he became John Maynard Keynes’s major opponent, speaking out against the policy of expansive state employment and warning against its inflationary policies. Hayek lost his battle with Keynes and Keynes proposals for further

interventions became the guidelines for economic policy decisions (Schulak, Unterköfler, p. 123, 2011).

### **2.1.5 Murray Rothbard**

Murray Rothbard (1926-1995) was a student of Mises after Mises moved to America. In Rothbard's book "Man, Economy and State" he expanded on Mises' approach, especially on monetary theory, the theory of monopoly, and the theory of capital and interest (Schulak, Unterköfler, p. 170, 2011).

Rothbard applied the Austrian perspective on the Great Depression in his book "America's Great Depression" and his findings contradicted the Keynesian interpretation of the depression. He demonstrated that inflation of the money supply created the boom in the 20s and how it led to the stock market crash of 1929 (Schulak, Unterköfler, p. 170, 2011).

### **2.1.6 Other Austrian economists**

Today many economists follow the Austrian tradition; Jesús Huerta de Soto is one of them, he wrote the book Money, Bank Credit, and the Economic Cycles. In that book he lays out a framework which can be used to find empirical evidence of an Austrian business cycle in the economy.

Roger W. Garrison made, in his book Time and Money: The Macroeconomics of Capital Structure, a graphical overview of the Austrian Business Cycle.

Thomas E. Woods Jr. wrote the book Meltdown about the current financial crises from an Austrian perspective.

## **2.2 Main Austrian theories**

To understand the Austrian Business Cycle Theory we have to examine how the Austrian School views money, interests, banking, credit expansion and inflation.

### **2.2.1 Money**

What is money? Mises answered that question in this way.

Money is the general medium of exchange used on the market. Money, the medium of exchange, is something that individuals choose in order to facilitate the exchange of commodities. Money is a market phenomenon. What does that mean? It means that money developed on the market, and



that its development and its functioning have nothing to do with the government, the state, or with the violence exercised by governments. (Mises, p. 3, 2010)

The Austrians reject the paper money standard which is used to day and is controlled by governments and their central banks. They call this kind of money fiduciary money, or fiat money, which is money backed by nothing and can be printed and expanded at will. Austrians argue that money is not a government invention rather that it originated in the market through barter. When people barter they directly exchange one good for another. But what happens when person A doesn't want what person B has? B now has to find someone who has a good that A wants and would like to have the good that B has. This is called "double coincidence of wants" and that is when money as a media of exchange comes in. The most marketable good becomes the general media of exchange, money. Mises (p. 32, 1953) pointed out that as soon as a commodity that is relatively most marketable has become common media of exchange there is an increase in the difference between their marketability and that of all other commodities, and that further strengthened and broadened their position as media of exchange.

Not all commodities are suited to become money; they have to possess certain qualities. Rothbard (p. 6-7, 2008) named five qualities, a good had to possess, which could lead the market to choose a particular commodity as money. It had to be heavy in demand, highly divisible, portable, high value per unit weight and it had to be highly durable. Through the centuries the market has chosen gold and silver as money. They possess all the qualities that Rothbard listed above. When Austrians advocate a commodity standard as the medium of exchange, they talk about a gold standard because they believe that the market would choose gold (or silver) to be money.

### **2.2.2 Interest**

Interest is a function of peoples time preference, that is people value goods today more than they value the same amount of goods in the future. Interest is the price that people pay to consume today instead of consuming tomorrow. Mises (p. 523, 1998) wrote that interest is homogeneous and that there are no different sources of interest. "Interest on durable goods and interest on consumption-credit are like other kinds of interest an outgrowth of the higher valuation of present goods as against future goods." (Mises, p. 523, 1998)

When Austrians talk about interests they are not just talking about interest rates on loans in the loanable market. Austrians make a distinction between that kind of interest and originary interest.

Originary interest is the ratio of the value assigned to want satisfaction in the immediate future and the value assigned to want satisfaction in remoter periods of the future. It manifests itself in the market economy in the discount of future goods as against present goods. It is a ratio of commodity prices, not a price in itself. There prevails a tendency toward the equalization of this ratio for all commodities. In the imaginary construction of the evenly rotating economy the rate of originary interest is the same for all commodities. (Mises, p. 523, 1998)

Originary interest is there for the ratio of the value of goods in the present and the value of goods in the future. Market rate, interest rates on loans on the market, is the originary rate plus the risk premium corresponding to the project that is being borrowed for plus the premium for expected inflation or deflation (de Soto, p. 289, 2009).

Changes in the money relation can influence the rate of the originary interest through forced saving (Mises, p. 545-546, 1998). During inflation commodity prices rise sooner and steeper than wage rates, wage earners who spend a great part of their income on consumption and save little are most affected by the rising prices. They are forced to restrict their expenditure. On the other hand the wealthier classes who save a great portion of their income don't increase their consumption in proportion with the inflation and there for save more. This forced saving lowers the rate of originary interest.

The market rate of interest can be lowered if people decide to save more and consume less in the present. This additional supply of loanable funds lowers the rate of interest on loans. The rates can also be lowered when the banking system creates money out of nothing through credit expansion. This new money adds to the supply of loanable funds as if people were saving more. This expansion may not cause a nominal decrease in the rate of interest.

Instead a decrease in relative terms, i.e., in relation to the interest rate which would have predominated in the market *in the absence of credit expansion*, is sufficient. Hence the reduction is even compatible with an increase in the interest rate in nominal terms, if the rate climbs less than it

would have in an environment without credit expansion (for instance, if credit expansion coincides with a generalized drop in the purchasing power of money). Likewise such a reduction is compatible with a decline in the interest rate, if the rate falls even more than it would have had there been no credit expansion (for example, in a process in which, in contrast, the purchasing power of money is growing). Therefore this lowering of the interest rate is a fact accounted for by theory, and one it will be necessary to interpret historically while considering the circumstances particular to each case. (de Soto, p. 349, 2009)

### **2.2.3 Banking and credit expansion**

Banks provide a valuable service to the economy, they channel savings into loans. When people put money into savings account the bank lends that money to entrepreneurs who then invest that money to expend and grow their business. The borrower then repays the loan with interest; the bank repays the saver back his money with interest. The bank makes money of this by charging the borrower higher interest than the saver receives. According to the Austrians this kind of banking, loan banking, is essential to the economy; it acts as an intermediary between the saver and borrower. “Credit, and loan banking, is productive, benefits both the saver and the borrower, and causes no inflationary increase in the money supply”. (Rothbard, p. 79, 2008)

Opposite to the loan banking is deposit banking, where people don't put money in a savings account but into an account which they can withdraw their money from at any time, Rothbard explains.

The hallmark of a loan, then, is that the money is due at some future date and that the debtor pays the creditor interest. But the deposit, or *claim transaction*, is precisely the opposite. The money must be paid by the bank *at any time* the depositor presents the ticket, and not at some precise date in the future. And the bank—the alleged “borrower” of the money—generally does not pay the depositor for making the loan. Often, it is the depositor who pays the bank for the service of safeguarding his valuables. (Rothbard, p. 87, 2008)

This form of banking would not cause any problems for the economy if the banks would keep the money in their vaults so that they would be there when the depositor would come and collect them. Banks, however, only keep part of the deposits and lend the rest out. This is called fractional reserve banking, when the savers money is lent out at the same time as he thinks that the money is available for him to redeem at any time.

This kind of banking is, according to Rothbard (p. 97, 2008), both fraudulent and inflationary. The money isn't really there for the saver to collect and the money supply has increased by the amount that the banks has issued loans from the deposits.

Another issue that the Austrians have with the fractional reserve banking is that the time structure of the fractional reserve bank assets are longer than their liabilities (Rothbard, p. 98, 2008). The loans the make are due at some date in the future but the liabilities, the deposits, are due immediately. "Put another way, *a bank is always inherently bankrupt*, and would actually become so if its depositors all woke up to the fact that the money they believe to be available on demand is actually not there." (Rothbard, p. 99, 2008)

When banks engage in fractional reserve banking they are in fact creating money out of thin air by lending out money that is still available to the saver at any time. When that newly created money finds its way into another bank what is to stop that bank to redeem that money from the bank that lent it out? That is where the Central Bank comes in. The Central Banks stands ready to bail out any bank in trouble, either by lending it reserves or by buying their assets (Rothbard, p. 133, 2008). Now all banks can expand credit together since they have the Central Bank behind them. "Thus, if Bank A and Bank B each increase their reserves, and both expand on top of such reserves, then neither will lose reserves on net to the other, because the redemption of each will cancel the other redemption out." (Rothbard, p. 133, 2008)

The Central Bank does more than to stand ready to bail out banks when they get into trouble, it can inflate the money supply by buying assets from the banks. When the Central bank buys assets from the banks they do it by writing a check on itself, creating it out of thin air. The bank then, through fractional reserve banking, lends most of this money out again, keeping only a fraction on reserve. That money is spent in the economy and finds its way into other banks who repeat this process. With a reserve requirement of ten percent, one million quickly becomes ten million. The Central Bank also controls the reserve requirement of the banks, thereby controlling how much money the banks can create through fractional reserve. "Obviously, the lower the reserve requirement, the more money the bank can lend and the greater the multiplication effect we saw above." (Woods, p. 121, 2009) This is how the Central Bank

can set in motion a credit expansion in the economy, by creating money out of thin air, which causes a boom through access to cheap money.

This kind of money and banking system is unsustainable according to the Austrians.

Thus, we see that the chronic and accelerating inflation of our time has been caused by a fundamental change in the monetary system. From a money, centuries ago, based solidly on gold as the currency, and where banks were required to redeem their notes and deposits immediately in specie, we now have a world of fiat paper moneys cut off from gold and issued by government-privileged Central Banks. The Central Banks enjoy a monopoly on the printing of paper money, and through this money they control and encourage an inflationary fractional reserve banking system which pyramids deposits on top of a total of reserves determined by the Central Banks. Government fiat paper has replaced commodity money, and central banking has taken the place of free banking. Hence our chronic, permanent inflation problem, a problem which, if unchecked, is bound to accelerate eventually into the fearful destruction of the currency known as *runaway inflation*. (Rothbard, p. 176, 2008)

#### **2.2.4 Inflation**

When people talk about inflation they generally mean rising prices of goods and services. Historically inflation has meant an increase in the amount of money in the economy (Murphy, p. 325, 2010). When the Austrians talk about inflation they mean the inflation of the money supply which can cause price inflation.

Mises (p. 21, 2010) points out that the problem is not to increase the quantity of money, the problem is to increase the quantity of things that can be bought with money. If you are only increasing the quantity of money and not the quantity of things you are only increasing the price you pay for these things. Even though the money supply is growing it doesn't necessarily mean that it will result in general price increase. The monetary inflation can be offset by increased productivity which lowers costs of production and increases the supply of goods causing prices to relatively stable (Rothbard, p. 169-170, 2000). The Austrians don't advocate a policy of stable price level since artificially stabilizing prices would distort and hamper the working of the market. Improved standards of living don't come from stable prices but from fruits of capital investment, increased productivity tends to lower prices and thereby distribute the

fruits of free enterprise to the public. Increasing the money supply and forcing up prices prevent this spread of higher living standards (Rothbard, p. 47-48, 2005).

When the money supply is increased prices don't rise immediately, it takes time for the new money to bid up prices. Those who get the money first gain since they can buy goods and services at the old price. Rothbard (p. 65, 2005) described inflation as race to see who can get the new money earliest. "The first receivers of the new money gain most, and at the expense of the latest receivers" (Rothbard, p. 65, 2005). Those who are most hard hit by inflation are the so called "fixed income groups", ministers, teachers, people on salaries, they lag notoriously behind other groups in acquiring the new money (Rothbard p. 65, 2005).

## **2.3 Austrian Business Cycle Theory (ABCT)**

### **2.3.1 Business Cycles vs. Business Fluctuations**

The economy goes through specific business fluctuations all the time but there is no reason for a special "cycle theory" to account for them, they are the result of changes in economic data and are fully explained by economic theory (Rothbard, p. 6, 2000). The role of businessmen, or entrepreneurs, is to forecast changes in consumers demand and act accordingly.

No one is surprised when a business has to close its doors. Businesses come and go all the time. Entrepreneurs are not infallible, and they sometimes make poor forecasts of consumer demand. They may have miscalculated their costs of production, failed to anticipate the pattern of consumer tastes, underestimated the resources necessary to comply with ever-changing government regulation, or made any number of other errors. Business failure is the inevitable consequence of our inability to know the future with certainty. (Woods, p. 64, 2009)

As we have shown, there is no need for a "cycle theory" to explain why some businesses go under. What if there is a weakness in a specific industry, can that cause a general recession or a depression?

Shifts in data will cause increases in activity in one field, declines in another. There is nothing here to account for a *general* business depression—a phenomenon of the true "business cycle." Suppose, for example, that a shift in consumer tastes, and technologies, causes a shift in demand from farm products to *other* goods. It is pointless to say, as many people do, that a farm depression will ignite a general depression, because farmers will buy

less goods, the people in industries selling to farmers will buy less, etc. This ignores the fact that people producing the *other* goods now favored by consumers will prosper; *their* demands will increase. (Rothbard, p. 6, 2000)

If failure of individual businesses or weaknesses in a specific industries don't warrants a special "cycle theory", when is there a need for a theory to explain the business cycle? When many businesses, in different sectors, often after a boom in those sectors, fail almost all at once there is a need for a specific "cycle theory" to explain that phenomenon. A business cycle theory must explain why almost every entrepreneur, some of who have been successful for a long time, seems to make forecasting errors, on consumers demand, at the same time. According to the Austrian Business Cycle Theory entrepreneurs are misled by artificially low interest rates caused by a credit expansion created by the banking system and central banks.

### **2.3.2 The Effects of Lower Interest Rates**

Entrepreneurs base their investment decisions, among other things, on the going interest rate, the lower the interest rate the more profitable investments projects seem to be. Mises (p. 364, 1953) points out that if a business enterprise which yields a net profit of 4 per cent and the interest on loans are 4.5 per cent the enterprise would not be undertaken. If the rate of interest would be lowered to 3.5 per cent through an expansion of credit the project would seem profitable and would be undertaken. When the credit expansion stops and rate climb back up to 4.5 per cent the enterprise is no longer profitable and has to be stopped or the entrepreneur has to make do with smaller profits. No matter which course of action is taken there has been a loss of value, not only from the individual point of view but also from the point of view of the community.

Interest rates can come down by two means, people decide to save more and consume less or by an artificial credit expansion created by the central bank and the banking system. With lower interest rates entrepreneurs invest more and business activity is stimulated, the economy grows and experiences a boom period. If the low rate of interest is the cause of people saving more these new projects can be completed and the boom time is not followed by a bust. If, on the other hand, the low interest rate is the cause of a credit expansion not enough funds are available to complete the projects and the boom comes to an end and a bust follow. Mises made the comparison

between an economy going through a credit expansion and a master builder who thinks he has more bricks than he actually has.

The whole entrepreneurial class is, as it were, in the position of a master-builder whose task it is to erect a building out of a limited supply of building materials. If this man overestimates the quantity of the available supply, he drafts a plan for the execution of which the means at his disposal are not sufficient. He oversizes the groundwork and the foundations and only discovers later in the progress of the construction that he lacks the material needed for the completion of the structure. It is obvious that our master-builder's fault was not overinvestment, but an inappropriate employment of the means at his disposal. (Mises, p. 557, 1998)

### 2.3.3 Long-term Projects

“From a business’s perspective, low interest rates provide an opportunity to engage in long-term projects that would not pay off under higher interest rates.” (Woods, p. 66-67, 2009) Long-term projects are more interest rate sensitive than short-term projects; so the lower the interest rate is ever more long-term projects are undertaken. Mises explains why entrepreneurs must start ever longer-term, or more roundabout, projects.

It is true that fresh capital can be employed in production only if *new* roundabout processes are started. But every new roundabout process of production that is started must be more roundabout than those already started; new roundabout processes that are shorter than those already started are not available, for capital is of course always invested in the shortest available roundabout processes of production, because they yield the greatest returns. It is only when all the short roundabout processes of production have been appropriated that capital is employed in the longer ones. (Mises, p. 360-362, 1953)

When the banks create new money and lend it to businesses it lowers the rate of interest and businessmen invest in longer processes of production, especially in higher order projects which are more remote from the consumer (Rothbard, p. 10, 2000). These projects are investments in capital, to be able to expand the production of consumer goods the entrepreneurs must first invest in plants that produce iron, steel, copper and other such goods that later become consumer goods (Mises, p. 557, 1998). Woods (p. 68, 2009) points out that these higher order projects bear fruit in the distant future at a time when the public has shown no signs of consuming less in the present and save more. “To the contrary, the lower interest rates encourage them to save less and thus *consume more*, at a time when investors are also looking to *invest more*



resources. The economy is being stretched in two directions at once, and resources are therefore being misallocated into lines that cannot be sustained over the long term.” (Woods, p. 68, 2009) This misleading signal that entrepreneurs get from the low interest rates caused by the credit expansion is the essence of the Austrian Business Cycle, as de Soto explains;

In a nutshell, this is a typical example of an inducement to mass entrepreneurial error in economic calculation or estimation regarding the outcome of the different courses of action entrepreneurs adopt. This error in economic calculation stems from the fact that one of the basic indicators entrepreneurs refer to before acting, the interest rate (along with the attractiveness of terms offered in the credit market), is temporarily manipulated and artificially lowered by banks through a process of credit expansion. (de Soto, p. 351, 2009)

#### **2.3.4 Malinvestment not Overinvestment**

Mises (1998) notes that overinvestment is not the essence of the credit expansion boom, but rather investments in the wrong lines of production, that is malinvestments. Entrepreneurs embark upon an expansion of production for which there is not enough capital available to suffice.

Their projects are unrealizable on account of the insufficient supply of capital goods. They must fail sooner or later. The unavoidable end of the credit expansion makes the faults committed visible. There are plants which cannot be utilized because the plants needed for the production of the complementary factors of production are lacking; plants the products of which cannot be sold because the consumers are more intent upon purchasing other goods which, however, are not produced in sufficient quantities; plants the construction of which cannot be continued and finished because it has become obvious that they will not pay. (Mises, p. 556, 1998)

The credit expansion has other effects on the economy than just mislead entrepreneurs to invest in long-term projects, the newly created money also affect prices. Entrepreneurs, who borrowed money from the credit expansion, now have to outbid other businesses for capital goods and labor. That causes the prices to go up for capital and labor, rising wages of consumers then causes the price of consumer goods to go up also, since consumers’ aren’t saving more because of the low interest rates. Even the entrepreneurs are consuming more, deluded by the illusory gains which their business accounts show (Mises, p. 550, 1998). Now all businesses, both those who

expanded their businesses and those who did not, need additional funds to operate because their costs of production are now higher. As long as the credit expansion continues the boom times will last. On the other hand, as Mises (p. 551, 1998) points out, if the credit expansion only last for a single period and then ceases altogether, the boom must very soon stop. “Evidently, the longer the boom goes on the more wasteful the errors committed, and the longer and more severe will be the necessary depression readjustment.” (Rothbard, p. 13, 2000)

### **2.3.5 The End of the Credit Expansion**

The credit expansion cannot last forever. The banks will stop expanding when they will become frightened by the accelerated pace of the boom. Any attempts by the banks to keep the expansion going for ever are doomed to fail. “If the credit expansion is not stopped in time, the boom turns into the crack-up boom; the flight into real values begins, and the whole monetary system founders.” (Mises, p. 559, 1998)

As soon as the afflux of additional fiduciary media comes to an end, the airy castle of the boom collapses. The entrepreneurs must restrict their activities because they lack the funds for their continuation on the exaggerated scale. Prices drop suddenly because these distressed firms try to obtain cash by throwing inventories on the market dirt cheap. Factories are closed, the continuation of construction projects in progress is halted, workers are discharged. As on the one hand many firms badly need money in order to avoid bankruptcy, and on the other hand no firm any longer enjoys confidence, the entrepreneurial component in the gross market rate of interest jumps to an excessive height. (Mises, p. 560, 1998)

When the credit expansion ceases and businesses can no longer access cheap loans from the banks, the malinvestments of the boom are become visible. In his book “America’s Great Depression” Rothbard (p. 13-14, 2000) explains what must happen when the crises sets in. Interest rates start to rise to their natural level. Wasteful projects must either be abandoned or used as best as they can be used, inefficient firms must be liquidated or have their debts scaled down or handed over to their creditors. Prices of producers’ goods must fall, especially in the higher orders of production, including capital goods, lands and wage rates.

In practice, this means a fall in the prices of the higher-order goods relative to prices in the consumer goods industries. Not only prices of particular machines must fall, but also the prices of whole aggregates of capital, e.g.,

stock market and real estate values. In fact, these values must fall more than the earnings from the assets, through reflecting the general rise in the rate of interest return. (Rothbard, p. 14, 2000)

According to the Austrians, the damage of the business cycle is not during the recession that sets in after the credit expansion has ceased; it's during the boom when all the malinvestments were made. The recession or depression is the cure, that's when resources are allocated into lines of production of goods that people actually want and need.

### **2.3.6 Recovery from the Boom Bust**

"The Austrian theory of the business cycle does not, and is not intended to, account for the length and persistence of a depression. It is a theory of the artificial boom, which culminates in the bust." (Woods, p. 76, 2009) The Austrians don't recommend any government programs to deal with the recession or depression that follows the boom, they advocate hands off, or laissez-faire, approach by the government. They believe that any government intervention in the economy only hampers the recovery and that the market should be left to its own device to reallocate resources into productive lines of production. Rothbard (p. 19-20, 2000) list six courses of action that governments should avoid implementing to fight of a recession-depression:

- *Prevent or delay liquidation.* By lending money or call on banks to lend further.
- *Inflate further.* By keeping the credit expansion going and keeping interest rates from rising.
- *Keep wage rates up.* By maintaining wage rates in a depression insures mass unemployment.
- *Keep prices up.* By keeping prices above their free-market levels will create unsalable surpluses.
- *Stimulate consumption and discourage saving.* By encourage consumption by "food stamp plans" and relief payments and discourage savings and investment by higher taxes they will shift the societal consumption-investment ratio in favor of consumption and prolong the depression.
- *Subsidize unemployment.* By implementing unemployment insurance and relief will prolong unemployment.

## 2.4 Graphical view of the ABCT

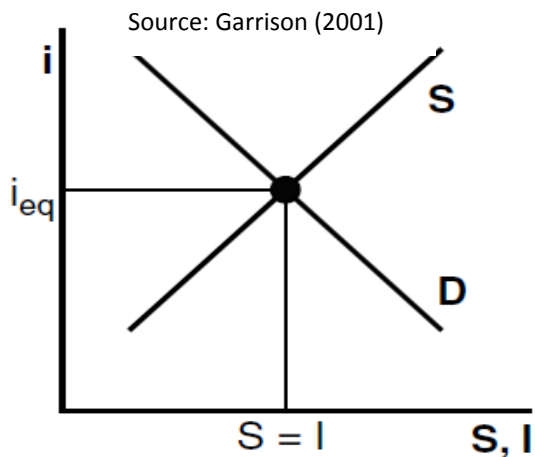
In his book, *Time and Money: The Macroeconomics of Capital Structure*, Roger W. Garrison gives a graphical view of the Austrian style business cycle. This chapter is a summary of his graphical exposition of capital-based-macroeconomics. All pictures and sub chapter titles are taken from Garrisons' book.

Garrison uses three graphical devices that serve as building blocks for his exposition of the business cycle. These graphs are (1) the market for loanable funds; (2) the production possibilities frontier; and (3) the intertemporal structure of production (Garrison, p. 34-35, 2001). The first two graphs are well known, the market for loanable funds shows the amount of savings at a given interest rate, the production possibilities frontier (PPF) shows the trade-off between consumption and investment. The third graph is the Hayekian triangle which shows the different stages of production and the production time.

First we will look at these three graphs separately to see how they each work and then we link them together to see how they relate to one another. Last we take a look at how an economy can grow in a sustainable way and then how an artificial boom can lead into a bust.

### 2.4.1 The market for loanable funds

In Figure 1 we have the supply and demand for loanable funds. The supply represents peoples' willingness to lend and the demand represents the eagerness to borrow at different interest rates. The amount of savings and investments are represented on the horizontal axis and interest rate the vertical axis. In this graph, saving equals borrowing by businesses which they use for investment. The supply of loanable funds is that part of people's income that is not spent on consumer goods, but is saved at interest, for example, in a bank. The demand is businesses willingness to borrow and invest in the means of production, at a given interest rate. Where demand and supply for loanable funds intercept is the market-clearing rate of interest  $i_{eq}$ .



**Figure 1: The market for loanable funds (or for investable resources)**

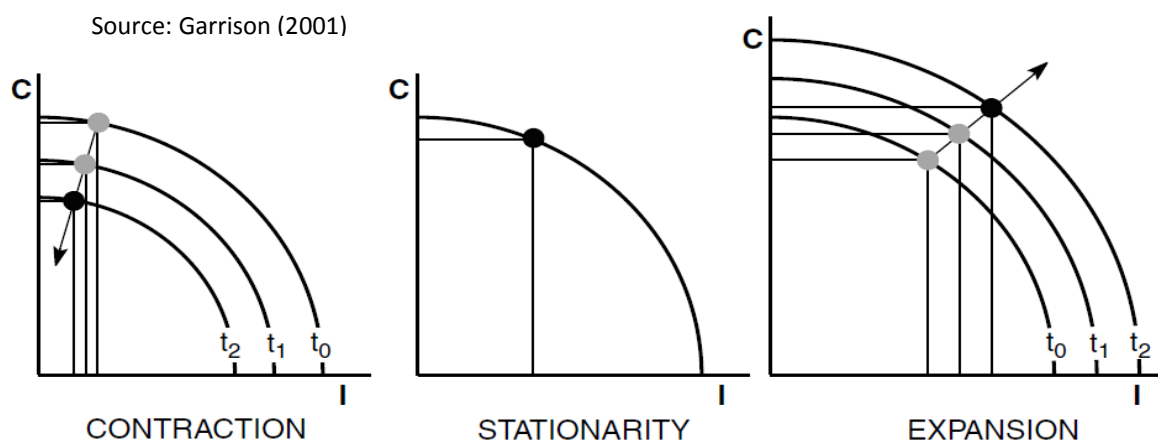
For use in macroeconomics Garrison makes two modifications to his interpretation. First, consumer lending is netted out on the supply side of this market. Second, the lending and borrowing in the supply and demand for loanable funds are broadened to include retained earnings and saving in the form of the purchasing of equity shares (Garrison, p. 36, 2001).

Garrison makes the point that when people save, they don't just save for the sake of saving but they save-up-for-something (Garrison, p.40, 2001). That means they don't consume in the present to be able to consume in the future. That is a profit opportunity for businesses to invest in the right means of production to meet these future consumption needs.

#### **2.4.2 The production possibilities frontier**

The second element in Garrisons' capital-based-macroeconomic model is the production possibilities frontier (PPF). In the PPF graph, consumption (C) is on the vertical axis and investment (I) is on the horizontal axis. The PPF shows a trade-off between consumption and investment and they are negatively related to one another which is represented by the downward slope of the curve. In Garrisons' PPF graph, investment includes both capital maintenance and capital expansion.

In Figure 2 we can see three PPF graphs each representing a different stage, the first shows an economy contracting, number two is a none growth economy and in the third represents an expanding economy.



**Figure 2: Gross investment and growth (contraction, stationarity, and expansion)**

As is shown in Figure 2, in an economy that is contracting consumption is high and investment is low. Businesses are not investing enough to offset capital depreciation and hence the economy is not able to increase production and expand the economy. In the graph representing a stationary economy, the combination of consumption and investment is enough for business to maintain their capital but there is no net investment. In an expanding economy people refrain from consumption and save so businesses can both maintain their capital and invest in new capital to increase production and expand the economy.

Combinations of consumption and investment on the PPF imply a fully employed economy but combinations inside involve unemployment of both labor and other resources. Can consumption and investment move to a level outside the PPF? "Consumption and investment can move together beyond the frontier but only temporarily; in real terms, points beyond are not sustainable. And, of course, in conditions where malfunctioning markets have economy-wide consequences, consumption and investment can move together inside the frontier; where scarcity is not binding, idleness can be traded for more of both kinds of output." (Garrison, p. 45, 2001)

### 2.4.3 The intertemporal structure of production

The third element in Garrisons' capital-based-macroeconomics is the intertemporal structure of production, or the Hayekian triangle. The triangle gives both the value dimension and the time dimension of the structure of production. In capital-based-macroeconomics capital is heterogeneous and different goods must be related to one another. Some portion of capital goods are remote from consumable output, some more than others. Figure 3 shows the Hayekian triangle where the relationship between the final output of the production process and the production time that the sequence of stages entails are represented graphically as the legs of a right triangle (Garrison, p. 46, 2001).

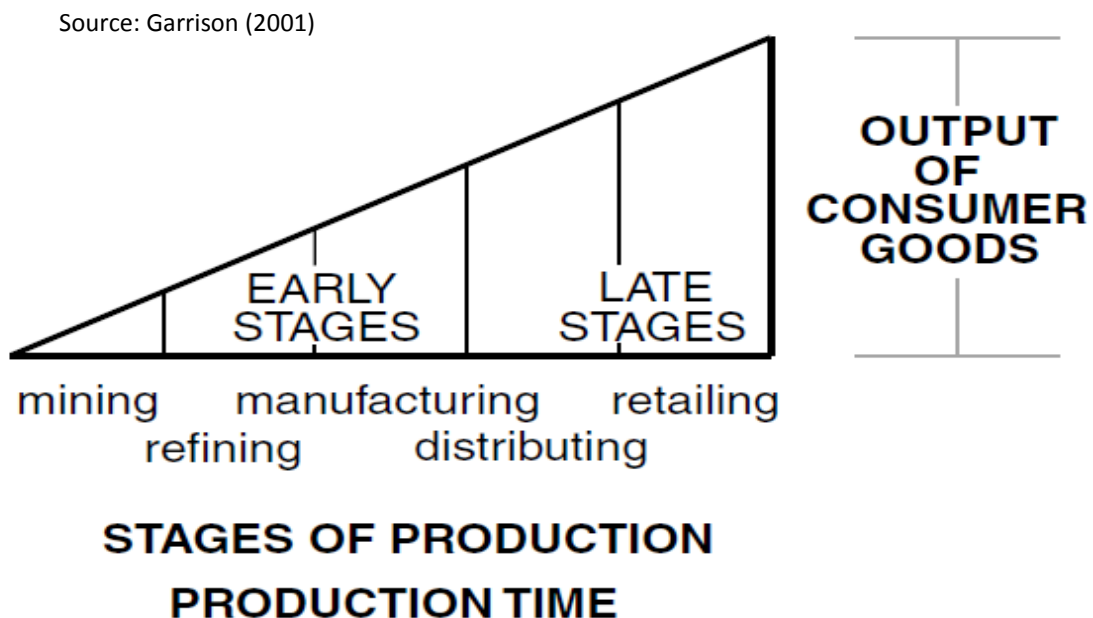


Figure 3: The intertemporal structure of production (continuous-input/point-output)

Garrison chooses to show the Hayekian triangle with five stages of production and labels them as mining, refining, manufacturing, distributing, and retailing. Why he chooses 5 instead of more or less stages is for the sake of illustrative purposes. "The choice of five stages rather than six or sixty is strictly a matter of convenience of exposition. To choose two stages would be to collapse the triangle into the two-way distinction between consumption and investment – the distinction that gets emphasis in the PPF." (Garrison, p. 46, 2001) The vertical axis on the right side of the triangle

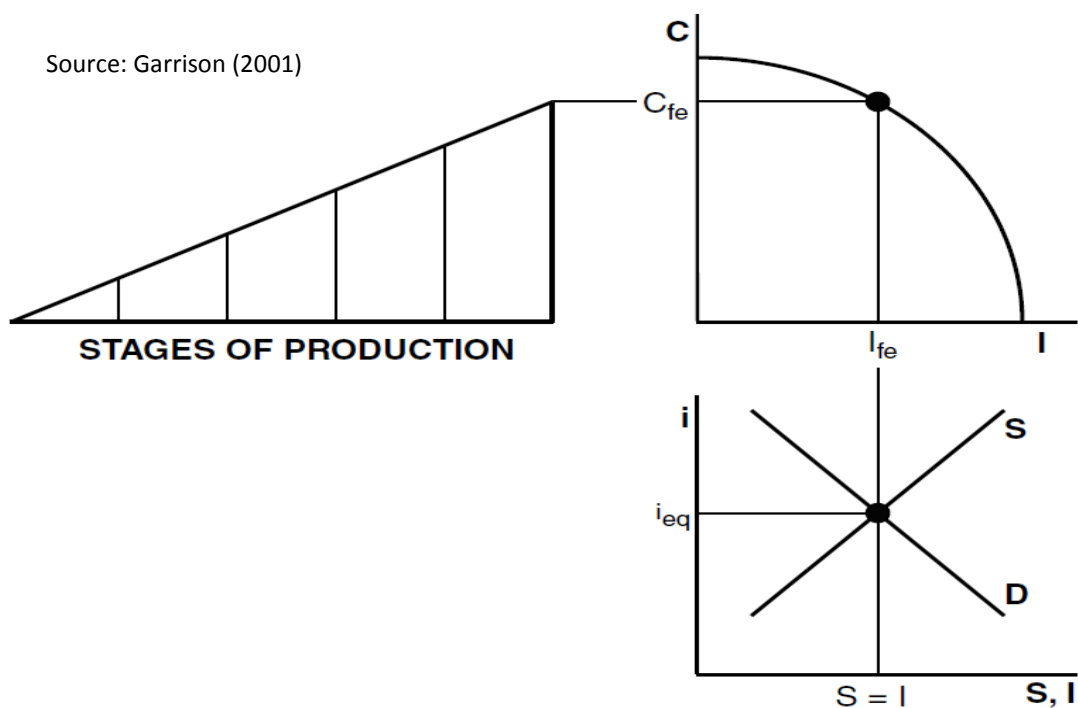
represents the amount of finished consumer goods. The horizontal axis is labeled “Production Time” and “Stages of Production”. The first connotes a time-consuming process and the other connotes the configuration of the existing capital structure (Garrison, p. 47, 2001).

In its strictest interpretation, the structure of production is conceptualized as a continuous-input/point-output process. The horizontal leg of the triangle represents production time. The vertical leg measures the value of the consumable output of the production process. Vertical distances from the time axis to the hypotenuse represent the values of goods-in-process. The value of a half-finished good for instance, is systematically discounted relative to the finished good - and for two reasons: (1) further inputs are yet to be added; and (2) the availability of the finished good lies some distance in the future. Alternatively stated, the slope of the hypotenuse represents value added (by time and factor input) on a continuous basis. The choice of a linear construction here over an exponential one maintains simplicity of exposition without significant loss in any other relevant regard (Garrison, p. 46, 2001).

#### **2.4.4 The macroeconomics of capital structure**

Now after having gone through the market for loanable funds, the PPF and the Hayekian triangle we can now show how they link up and represent the whole economy. In Figure 4 we see that the loanable market and the PPF are connected through their horizontal axis which represents investment in the economy. The PPF then connects with the triangle through the vertical axis on the PPF and the right hand side of the triangle, showing total consumption by the consumers.





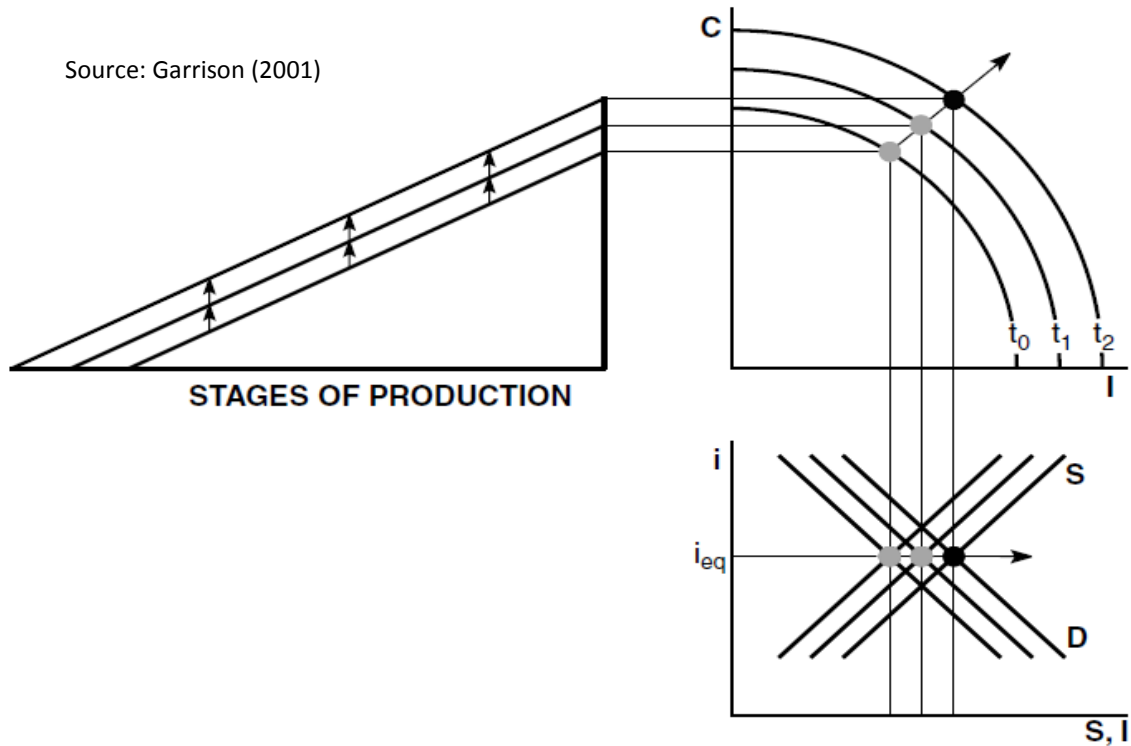
**Figure 4: The macroeconomics of capital structure**

The point  $i_{eq}$  in Figure 4, where the supply and demand for loanable funds intersect, is the natural rate of interest.  $I_{fe}$  on the PPF part of the graph represents total investment in the economy; in this case it is just enough to offset capital depreciation, meaning that there is no new investment.  $C_{fe}$  on the vertical axis of the PPF and on the right side of the triangle shows the amount of consumption in the economy. Since gross investment in this economy is distributed among the different stages of production, to maintain its level of production, it isn't able to expand and it is there for stationary. The consumers don't refrain from consuming so there are no new funds for businesses to invest in capital of production.

#### **2.4.5 The macroeconomics of secular growth**

Now that we have seen how the three elements of capital-based-macroeconomics link up with one another in a stationary economy it's now time to see how an economy can grow. First we look at a secular growth, a growth that is not provoked by policy or by technological advance or by a change in intertemporal preferences. Secular growth occurs when gross investment is enough to both invest in capital maintenance and

capital accumulation. Figure 5 shows an economy in its initial stage ( $t_0$ ) and then two successive periods of secular growth ( $t_1$  and  $t_2$ ).



**Figure 5: Secular growth (with assumed interest-rate neutrality)**

The growth in the economy in Figure 5 is represented by an outward shift in the PPF, from  $t_0$  to  $t_1$  and then to  $t_2$ . But what is happening in the other two elements of the capital-based-macroeconomic model? The supply and demand for loanable funds are also shifting outwards, savers are supplying more of their increasing income to savings and businesses are demanding more funds to invest. This outward shift is consistent with no preference changes by consumers. Businesses are investing more to accommodate future demands by consumer that is growing with ever increasing income. Since there is no intertemporal preference change the supply and demand for loanable funds shifts to the right with no change in the interest rate.

As we can see, in Figure 5, there is no change in the slope of the Hayekian triangle. That is because that there is no change in the interest rate, the unchanged rate allows for a change in the size of the stages of production but not the profile of the capital

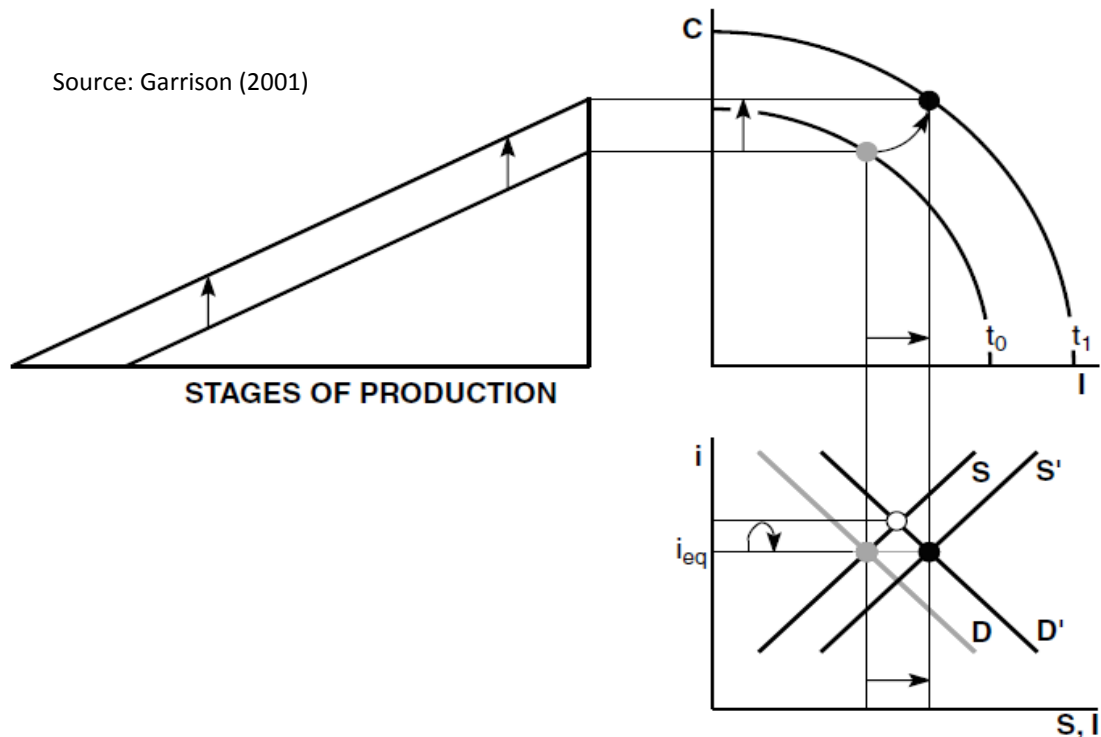
structure of the triangle. As more is invested in each of the stages of production, more consumer goods are produced. Peoples' consumption rises but not as rapidly as their income rises since savings, which enables investment in the factors of production, rises too.

How can people's income increase, which allows them to consume and save more without there being an increase in the money supply? Garrison explains in his book that the macroeconomics of secular growth, as it is depicted in Figure 5, does not keep track of the relationship between the money supply and the general level of prices.

“Money and prices can be kept in perspective, however, with the aid of the familiar equation of exchange,  $MV = PQ$ . For a given money supply ( $M$ ) and a given velocity of money ( $V$ ), the increases in both consumption and investment ( $C + I = Q$ ) imply decreases in the general price level ( $P$ ). That is, secular growth is accompanied by secular price deflation.” (Garrison, p.55, 2001)

#### **2.4.6 Changes in technology and resource availabilities**

Technological advances can cause the economy to grow, although they usually occurs in one or a few markets at a time they, through resource reallocation, allow for a increases in the PPF all around. Technological advances causes the PPF to shift outwards and the demand for loanable funds to move to the right as businesses want to borrow more to take advances of these advances in technology. With higher income the supply for loanable funds also shifts to the right.



**Figure 6: Technology-induced growth**

In Figure 6 we have a technology-induced growth where the technological change is interest-rate neutral. Here Garrison identifies two cases:

“(1) the technological advance affects all stages of production directly and proportionally, so that no reallocation of resources among the different stages is called for; and (2) scope for resource reallocation allows the implementation of technology that is usable only in one or a few stages to have an immediate or nearly immediate impact on current consumption. In either case, the economy’s growth path would be shifted upward but would not otherwise change.” (Garrison, p. 58, 2001)

The two solid points on the graph for the market for loanable funds show the initial and subsequent equilibrium for the supply and demand for loanable funds. “Investment, output, income, consumption, and saving would all rise together without putting pressure one way or the other on the rate of interest. In the second case, the demand for loanable funds rises first as producers seek to take advantage of new technology that directly affects, say, an early stage of production.” (Garrison, p. 58, 2001) As we can see in Figure 6 the demand for loanable funds shifts from  $D$  to  $D'$  which causes the interest rate to rise to where  $D'$  and  $S$  intercept.

“Because the technological advance occurred in an early stage, consumable output does not experience an immediate increase. However, the increased interest rate causes resources not directly involved in implementing the new technology to be reallocated towards the late and final stages of production, which allows consumption to increase. As income increase (due to resource reallocations), saving also increases. The supply of loanable funds shifts from  $S$  to  $S'$ , and the interest rate is driven back to its initial level.” (Garrison, p. 58, 2001)

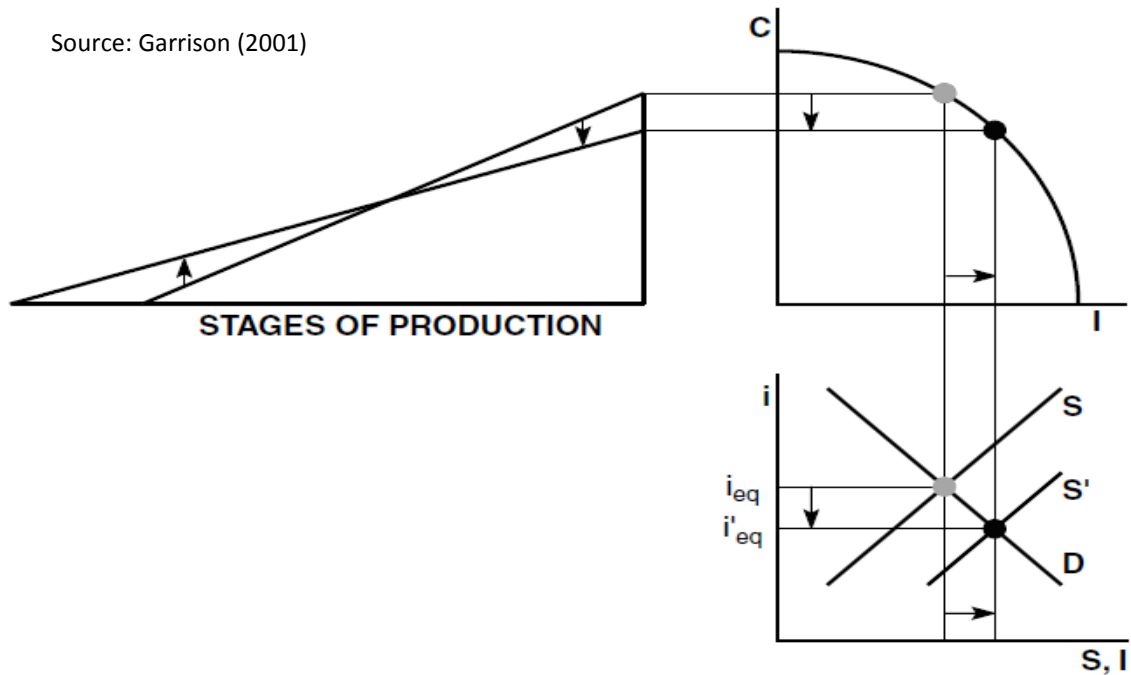
“It may well be that the initial increase in the interest rate, which acts as a brake on the rate at which technological advance is exploited, is followed by a decrease in the interest rate, as the accelerated accumulation of wealth (relative to accumulation prior to the innovation) is accompanied by a change in intertemporal consumption preferences. Allowing for this effect (from innovation to increased wealth to lower time preferences), we see technological innovation as causing the equilibrium rate of interest to fall even though the adjustment to this new equilibrium may involve a temporarily high interest rate. More importantly for the application of our capital-based macroeconomic framework, the economy’s pattern of growth, as boosted by the technological advance, is a sustainable one. That is, the change in the underlying economic realities imply an altered growth path; the market process translates the technological advance into the new preferred growth path; and there is nothing in the nature of this market process that turns the process against itself.” (Garrison, p. 60, 2001)

#### **2.4.7 Changes in intertemporal preferences**

Like changes in technology can set in motion a sustainable growth, a changes in intertemporal preferences can also give rise to permanent, or sustainable growth.

Figure 7 depicts an increase in peoples’ willingness to save which causes the supply curve for loanable funds to shift to the right. Consumers have restricted their consumption in the present to be able to consume more in the future; they are saving-up-for-something.

Source: Garrison (2001)



**Figure 7: Saving-induced capital restructuring**

The rightward shift in the supply from  $S$  to  $S'$  causes the supply to intercept at a new and lower rate of interest which increases the amount of funds borrowed by businesses. On the PPF graph we see that there is a movement downwards along the curve indicating less consumption by the public and more investment by businesses.

“Note the consistency in the propositions that (1) there is a movement along the PPF rather than off the PPF; and (2) there is no significant income effect on the supply of loanable funds. If consumption decreased without there being any offsetting increase in investment, then incomes would decrease as well and so too would saving and hence the supply of loanable funds. The negative income effect on the supply of loanable funds would largely if not wholly negate the effects of the preference change.” (Garrison, p. 63, 2001)

Since there is less consumption and an increased investment in the economy the Hayekian triangle changes shape, the slope of the triangle becomes shallower. Because people are consuming less, businesses stop investing in the later stages of production and take advances of the lowered interest rate to invest in early stages.

“That is, if the marginal increment of investment in early stages was just worthwhile, given the costs of borrowing, then additional increments will be seen as worthwhile, given the new, lower cost of borrowing. While many firms are simply reacting to the spread between their output prices and

their input prices in the light of the reduced cost of borrowing, the general pattern of intertemporal restructuring is consistent with an anticipation of a strengthened future demand for consumption goods made possible by the increased saving.” (Garrison, p. 63-64, 2001)

Figure 7 shows a decrease in consumption and more savings but does not show how increased investment ultimately causes an increase in the output of consumption goods. To see how that comes about Garrison superimposes the relative changes depicted in Figure 5. “The two figures taken together suggest a slowing of the growth of consumption while the capital restructuring is being completed followed by an acceleration of the growth rate. The growth rate after the capital restructuring will be higher than it was before the preference change.” (Garrison, p. 64, 2001)

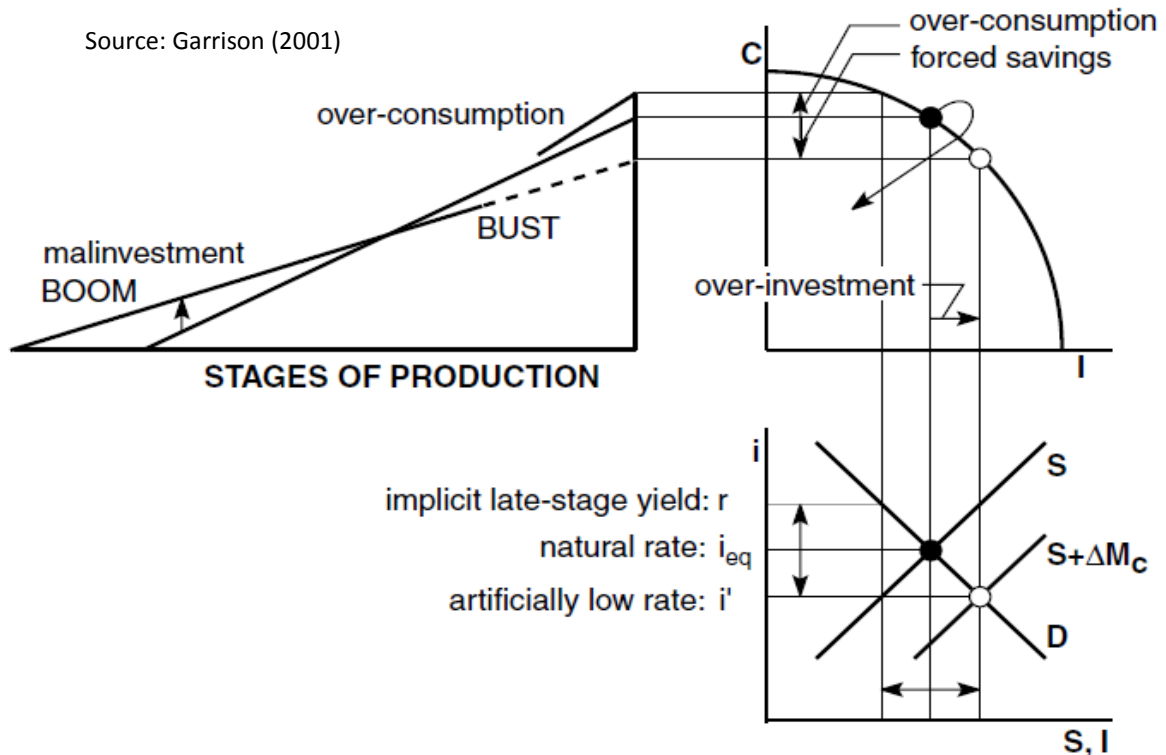
#### **2.4.8 The macroeconomics of boom and bust**

After having taken a look at how an economy can grow in a sustainable way through a secular growth, changes in technology and by changes in intertemporal preferences we will now see how an artificial growth turns into a bust. Garrison states that the capital-based macroeconomics can identify the essential differences between genuine growth and an artificial boom, the key differences are the differing roles played by savers and by the monetary authorities (Garrison, p. 67, 2001).

The reallocations of resources brought about by a preference change did not involve monetary authorities, but the Austrian theory of the boom and bust requires that monetary considerations be taken into account for two reasons. “First, the relative-price changes that initiate the boom are attributable to a monetary injection. The focus, however, is not on the quantity of money created and the consequent (actual or expected) change in the general level of prices.” (Garrison, p. 67, 2001) The focus is rather on the point of entry of the new money and the changes in relative prices that govern the allocation of resources over time. The second reason for is that the different aspects of the market process set in motion by a monetary injection are not mutually compatible (Garrison, p. 67, 2001).

Figure 8 shows how the economy responds to a credit expansion. Intertemporal preferences are assumed to be unchanged and a monetary authority is in control of the money supply. The change in the market for loanable funds from our previous examination is that the supply of loanable funds, include both real savings and funds

made available by the monetary authorities. The new money in the form of credit expansion is labeled  $M_c$  in Figure 8.



**Figure 8: Boom and bust (policy-induced intertemporal disequilibrium)**

After the new money is lent into existence the supply of savings in the market for loanable funds shifts to the right and causes the interest rate to fall. This change in interest rate, that the credit expansion causes, is similar to the change that intertemporal preferences changes caused in Figure 7. But we have to look at this lower interest rate relative to the rate that would have existed without the credit expansion.

In Figure 7, investment increased to match the increase in saving but in Figure 8, investment and saving move in opposite direction.

“Padding the supply of loanable funds with newly created money drives a wedge between saving and investment. With no change in intertemporal preferences, the actual amount of saving decreases as the interest rate falls, while the amount of investment, financed in part by the newly created funds, increases.” (Garrison, p. 70, 2001)



We can also see this conflicting movement in saving and investment in the PPF. Lower interest rate causes people to save less and consume more while those same lower interest rate causes businesses to invest more. “The two forces resolve themselves into an outward movement – toward the north-east. Increases in the employment of all resources, including labor, beyond the level associated with a fully employed economy causes the economy to produce at a level beyond the PPF.” (Garrison, p. 70, 2001)

The conflicting behavior of consumers and investors, triggered by credit expansion, involves the over-production of both categories of goods. Garrison describes this wedge between saving and investment in the loanable funds market, which translates to the PPF, as a tug-of-war (with a stretchable rope) between consumers and investors.

“Conflicting market forces are trying to pull the economy in opposite directions. Understanding subsequent phases of this process requires that we assess the relative strengths of the combatants in this tug-of-war. As the rope begins to stretch, the conflict is resolved initially in favor of investment spending – because the investment community has more to pull with, namely, the new money that was lent into existence at an attractive rate of interest. In the Austrian analysis, while an increased labor input – and general over-production – is undoubtedly part of story, there is also a significant change in the pattern of the capital input. The movement beyond the frontier gives way to a clockwise movement; the unsustainable combination of consumption and investment takes on a distinct investment bias.” (Garrison, p. 71, 2001)

What affects does this tug-of-war have on the Hayekian triangle in Figure 8? The credit expansion sets in motion two conflicting processes of capital restructuring, the triangle is being pulled at both ends (by cheap credit and strong consumer demand) at the expense of the middle which, according to Garrison, is a tell-tale sign of the boom’s unsustainability.

“The tug-of-war between investors and consumers that sends the economy beyond its PPF pulls the Hayekian triangle in two directions. Having access to investment funds at a lower rate of interest, investors find the longer-term investment projects to be relatively more attractive. A less steeply sloped hypotenuse illustrates the general pattern of reallocation in the early stages of the structure of production. Some resources are bid away from the intermediate and relatively late stages of production and into the early stages. At the same time, income earners, for whom that same lower interest rate discourages saving, spend more on consumption. A more steeply sloped hypotenuse illustrates the pattern of reallocation in the final

and late stages of production. Some resources are bid away from intermediate and relatively early stages into these late and final stages. (Garrison, p. 72, 2001)

### 3 Hypotheses

The Icelandic economy went through a spectacular boom and bust cycle in the first decade of the 21<sup>st</sup> century. Iceland went from enjoying one of the highest living standards in the world to seeking help from the International Monetary Fund (IMF) after the banking sector collapsed in 2008. The main focus of debate in Iceland, after the crises hit the country, has been on the fall of the banks and that their bankruptcies was what caused the recession that Iceland found itself in. Less emphasis has been on what caused the boom and if the boom could be the cause of the Icelandic recession, as the Austrians would claim. Could it be that the boom that the economy went through put it on an unsustainable path that eventually would turn into a bust, irrelevant of the banks going bankrupt?

The Austrian Business Cycle Theory is a theory of the boom which eventually must lead to a bust. The question that this research tries to answer is the following; are there empirical evidences that the Icelandic economy went through an Austrian style business cycle in the years from 2000 to 2010.

To see if the economy followed the path that the ABCT predicts we follow a framework that Jesús Huerta de Soto lays out in his book “Money, Bank Credit, and Economic Cycles”. De Soto (p. 506–507, 2009) lists the different phases the market processes, according to the ABCT, goes through when there is an expansion of bank credit unbacked by a prior rise in voluntary saving. De Soto breaks up the boom and bust cycle into 5 different stages, expansion, boom, crisis, depression and recovery and then lists scenarios that the economy goes through under each stage.

#### Expansion

- Consumption does not decline.
- Banks grant new loans on a massive scale and the interest rate drops.
- Capital goods rise in price.
- Prices climb on the stock market.
- The productive structure is artificially lengthened.

- Large accounting profits appear in the capital-goods sector.

#### Boom

- The capital-goods sector demands more workers.
- Wages rise.
- The expansionary and stock market boom becomes widespread. Rampant speculation.

#### Crisis

- Monetary demand for consumer goods begins to grow (increased earned and entrepreneurial income is devoted to consumption).
- At some point the rate of growth in credit expansion ceases to mount: the interest rate climbs. The stock market crashes.
- Accounting profits appear in the consumer sector (demand increases).
- The prices of consumer goods begin to grow faster than wages, in relative terms.
- Real wages fall. The Ricardo Effect: capital equipment is replaced by workers.

#### Depression

- The capital-goods sector sustains heavy accounting losses. (Demand decreases, the Ricardo Effect, and costs rise. The interest rate and the prices of commodities increase.)
- Workers are laid off in capital goods industries.
- Entrepreneurs liquidate erroneous investment projects: bankruptcies and suspensions of payments. Widespread pessimism.
- Bank default mounts: Marginally less solvent banks face serious difficulties. Credit squeeze.
- Workers are again employed in stages close to consumption.
- Capital is consumed, and the productive structure becomes shorter.
- The production of consumer goods and services slows.
- The relative prices of consumer goods rise even further (decreased supply and increased monetary demand).
- National income and wages drop in real terms.

## Recovery

- Once the readjustment has occurred, an increase in voluntary saving may bring recovery or credit expansion may begin again.

In this research we will go through each stage and see if we can find empirical evidence that the Icelandic economy went through these different stages and scenarios. If we find evidence of that we can conclude that the Icelandic economy went through an Austrian style business cycle. The data that will be used can be mostly found at the websites of Statistics Iceland and the Central Bank of Iceland.

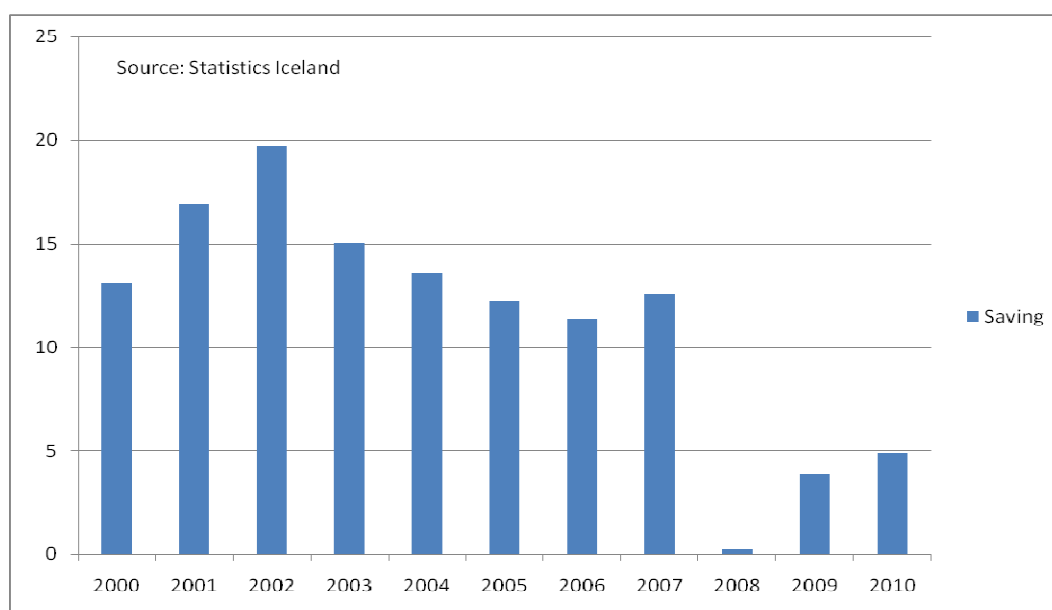
The main focus in the research will be the expansion and the boom part of the cycle, to see if the investments that were of the kind that the Austrian theory predicts would be made during an artificially credit expansion. The crisis and depression periods of de Soto's list will be analyzed to see if those investments made during the other periods were indeed found out to be malinvestments as the theory predicts. Since the Icelandic economy is still in the depression period it makes the analyses of the crisis/depression periods harder because not all of stages have materialized. The recovery period will be excluded since the economy hasn't reached that stage of the cycle.

## 4 Iceland and the Austrian Business Cycle

### 4.1 Expansion

#### 4.1.1 Consumption does not decline

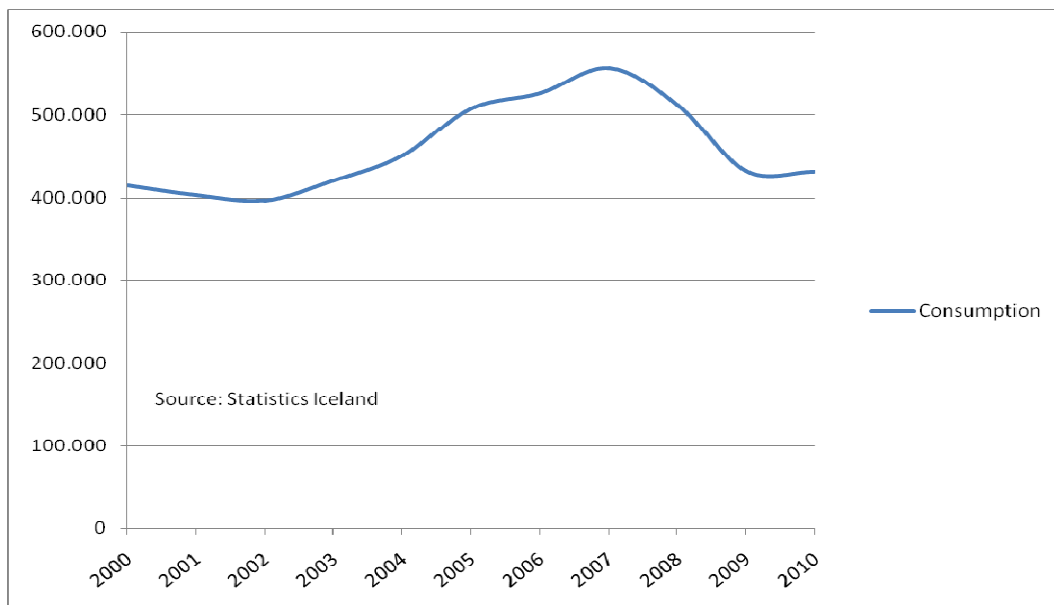
According to the Austrian theory; an expansion of credit don't cause malinvestments on a large scale if there is real savings behind the additional credit. The first thing we must take a look at, when examining if the Icelandic economy went through an Austrian style business cycle, is if the public was refraining from consumption and saving more. If there wasn't more saving in the economy, supplying additional credit, investments made would be found out to be malinvestments when the credit expansion ceased. Figure 9 shows gross savings in the economy as a percent of GDP.



**Figure 9: Gross saving as a percent of GDP (unit: percent)**

Until 2002 saving as a percent of GDP was increasing but then declined in 2003 and kept going down until 2007. This decline in savings indicates that the public wasn't supplying the financial system with more credit, credit should have been contracting and interest rates should have been going up.

Figure 10 shows the household final consumption expenditure in constant prices, reference year is 2000. The figure shows that consumption was increasing every year from 2003 until 2007. The increase in consumption didn't come to an end until the credit expansion came to an end in 2008. This increased consumption by households' took place at the same time when saving in the economy was decreasing, further indicating that the public wasn't saving more, but rather spending more. Since the public wasn't saving more and their expenditure were increasing every year until after 2007 the conclusion can be made that there wasn't additional saving in the economy to support an expansion of credit.



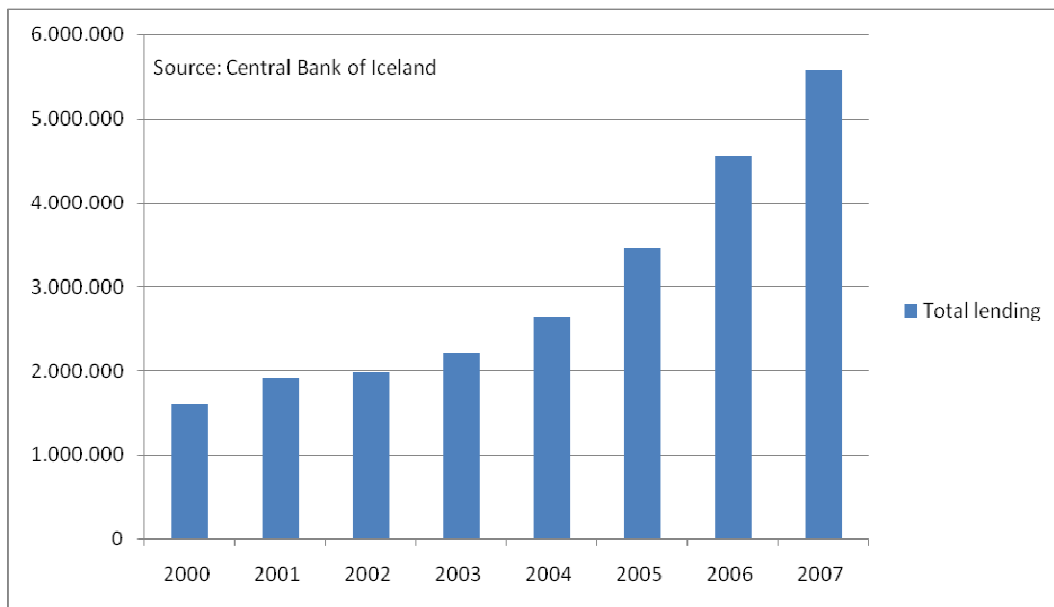
**Figure 10: Household final consumption expenditure (unit: Million ISK)**

From Figures 9 and 10 we see that saving in the economy was increasing until 2003 and consumption was decreasing at the same time indicating that the economy could be on a sustainable course. In 2003 that trend reversed and possibly setting the economy on a unsustainable course if an artificial credit expansion would follow this reversal in trend.

#### **4.1.2 Banks grant new loans on a massive scale and the interest rate drops**

Since the pool of real savings in the economy wasn't increasing there was no base for a credit expansion in Iceland. If we find that there was an expansion of credit we can

conclude that new money was either being created out of thin air or it came from abroad through the banking system. How or where that credit came from is irrelevant to this research since we are only looking to see if the expansion created an Austrian style boom, not what or who is responsible for creating the expansion. Figure 11 shows the total lending by the financial system, yearend status, from 2000 till 2007. In 2008 the three big banks went bankrupt and credit froze, therefore numbers after 2007 are not included in the graph.



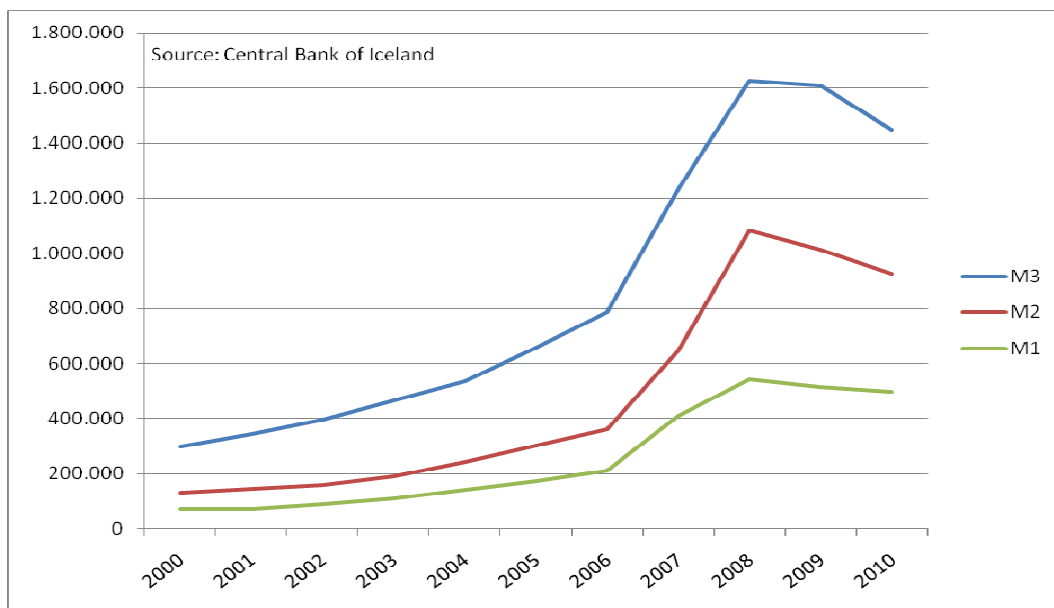
**Figure 11: Total lending, yearend status (unit: million ISK)**

From 2000 until 2007 lending by the financial system went up by more than two hundred and forty percent. This increase went on at the same time that saving in the economy was falling and consumption was increasing. Under these circumstances, according to the Austrian theory, the Icelandic economy should be heading towards an unsustainable boom. As in Figures 9 and 10 Figure 11 shows that in the year 2003 lending really took off at the same time savings started to go down and consumption started increasing.

Since the increased credit wasn't coming from real saving there should be considerable increase in the money supply. An increase in the money supply is inflation according to the Austrians and the new money should eventually filter through the

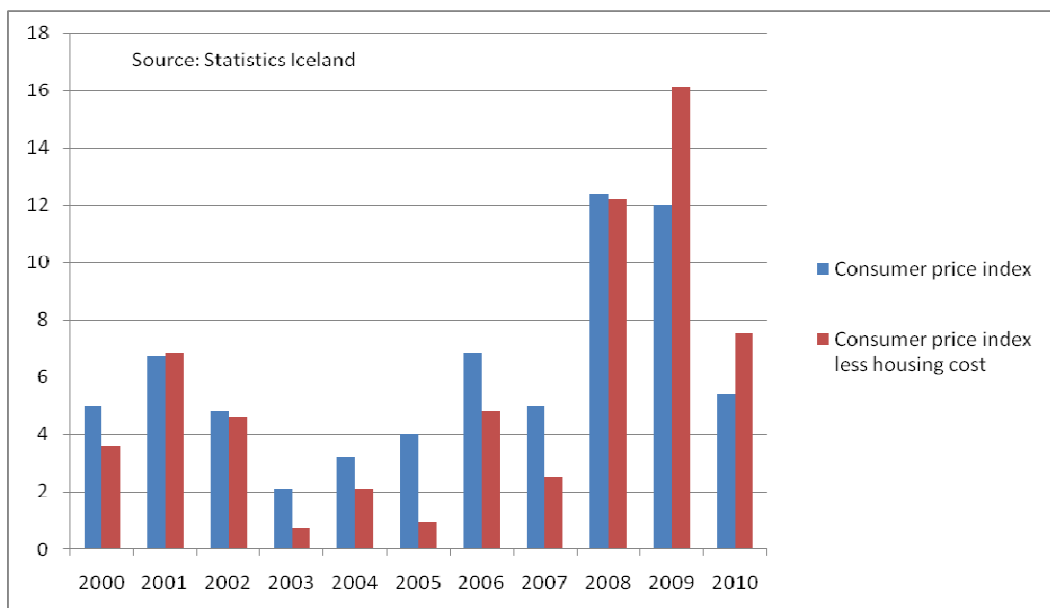


economy and start bidding up prices and therefore causing price inflation. Figure 12 shows the changes in the money supply from 2000 till 2010.



**Figure 12: Money supply (unit: million ISK)**

The inflation created by the increased credit was considerable; the money supply more than doubled between 2004 and 2007, the years when credit increased the most. According to the theory this new money should have caused prices in the economy to increase, though other factors could influence prices and causing them to go down and counterbalancing the inflation. Figure 13 shows the average annualized rates for the consumer price index (CPI) and CPI less housing costs from 2000 to 2010.

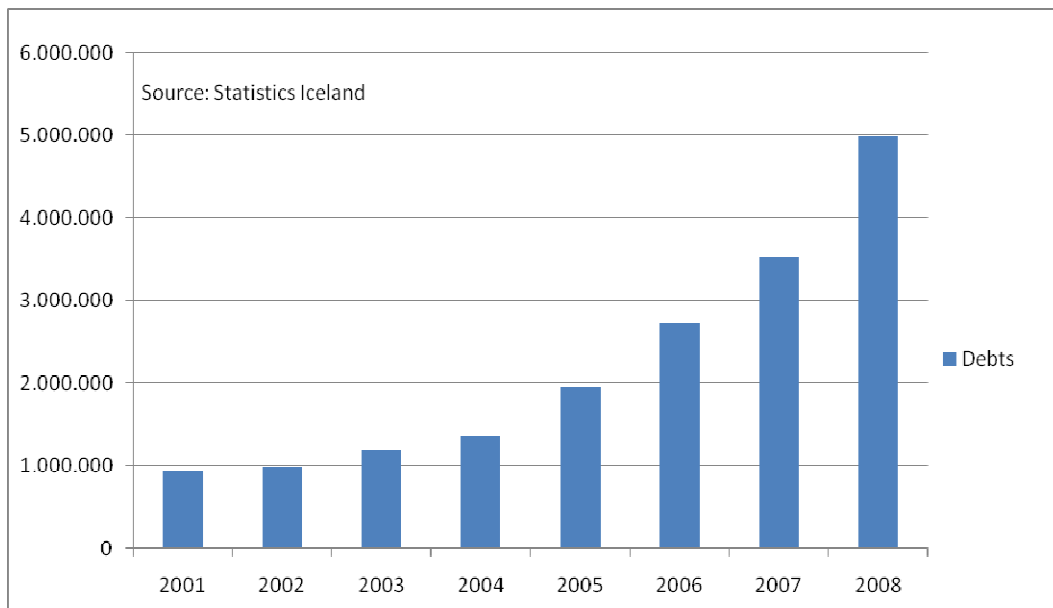


**Figure 13: Consumer price index (CPI) and CPI less housing costs (unit: percent)**

Iceland has a history of high price inflation and the CPI has rarely been under the 2.5 percent inflation target set by the CBI. In 2003 the CPI was just over two percent and the CPI less housing cost was under one percent, from 2004 and onwards the CPI took off showing that prices in the economy were increasing at a fast rate. Again the year 2003 seems to be the turning point in the economy, price inflation didn't take off until 2004 while the money supply started increasing at a faster rate in 2003. The reason why price increase didn't take off until year after the money supply started increasing is explained by the Austrians by the fact that it takes time for new money to filter through the economy and bid up prices.

As can be seen in Figure 13 the CPI less housing cost was lower than the actual CPI from 2004 until 2008, which shows that housing cost was rising at a faster rate than other prices indicating a bubble in the housing market. After 2008 the housing part of the CPI decreased causing the actual CPI to be lower than CPI less housing cost, indicating that the housing bubble had popped.

Figure 14 shows total debt of enterprises excluding financial institutions and electricity and water supply. From 2005 till 2008 businesses took advantage of the increasing credit in circulation and leverage up.



**Figure 14: Total debts of enterprises excluding financial institutions and electricity and water supply (unit: million ISK)**

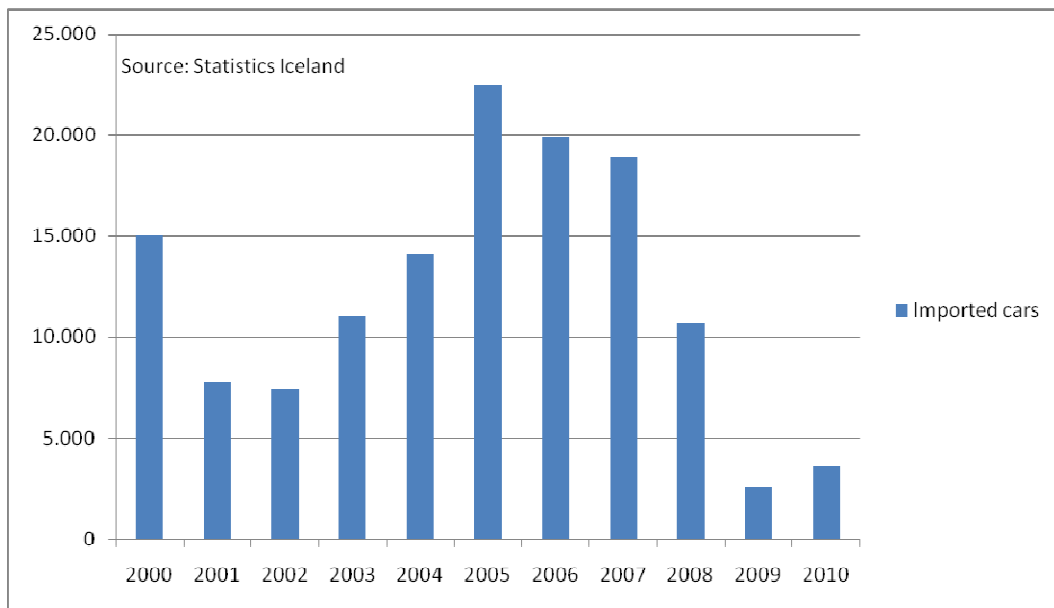
Since, as we have seen, there wasn't any increase in real saving behind the credit expansion many businesses, according to the theory, embarked on an expansion of production for which there is not enough capital available to finish and will be found out to have been malinvestments when the credit expansion comes to a stop.

According to the Austrian theory this increased credit should lower the interest rates from what they would have been absent the credit expansion. The Central Bank of Iceland kept policy rates high in nominal terms from 2000 to 2008 but as Bagus and Howden (p. 45, 2011) showed, real interest rates were low due to high inflation numbers during that time.

**Table 1: CBI policy rate, inflation and real interest rates (unit: percent)**

	<b>Policy Rate</b>	<b>Targeted Inflation</b>	<b>CPI</b>	<b>Real Interest Rate</b>
<b>2000</b>	10,5	2,5	5,0	5,5
<b>2001</b>	10,9	2,5	6,7	4,2
<b>2002</b>	8,4	2,5	4,8	3,6
<b>2003</b>	5,4	2,5	2,1	3,2
<b>2004</b>	6,2	2,5	3,2	2,9
<b>2005</b>	9,4	2,5	4,0	5,3
<b>2006</b>	12,5	2,5	6,8	5,3
<b>2007</b>	13,8	2,5	5,0	8,8
<b>2008</b>	15,6	2,5	12,4	3,2

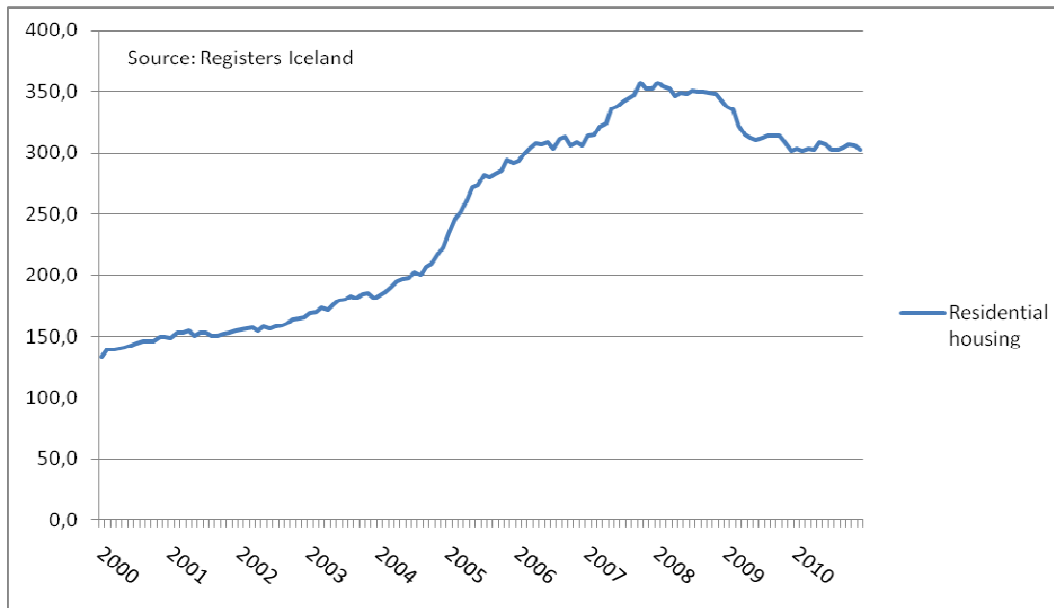
Though the real interest rates were relative low from 2002 till 2005, when they went over 5 percent, nominal rates were high on loans dominated in ISK. The financial institutions responded by offering loans, to businesses and consumers, dominated in foreign currencies, taking advantage of low interest rates abroad. These low interest rate loans were, among other things, offered to consumers to buy cars, allowing them to escape high interest rate loans in ISK. This made the high nominal interest rate irrelevant to the consumers, the low rate encouraged them to spend more and save less. Figure 15 shows imported cars from 2000 to 2010, the number of cars imported went from 7.716 to 22.456 in 2005 and didn't fall substantially until the year the banks went bankrupt. This further shows that consumers were not saving more despite high nominal interest rates but rather taking on more debt to consume more.



**Figure 15: Imported passenger cars, including 4WD**

### 4.1.3 Capital goods rise in price

The increased lending by the Icelandic banks didn't just cause people to buy new cars, in 2004 the banks entered the housing market offering mortgages at a lower rate than the Icelandic Housing Financing Fund (HFF). This increased access to lower rate mortgages caused residential housing prices to go up. Figure 16 shows the residential housing prices index for the capital area.

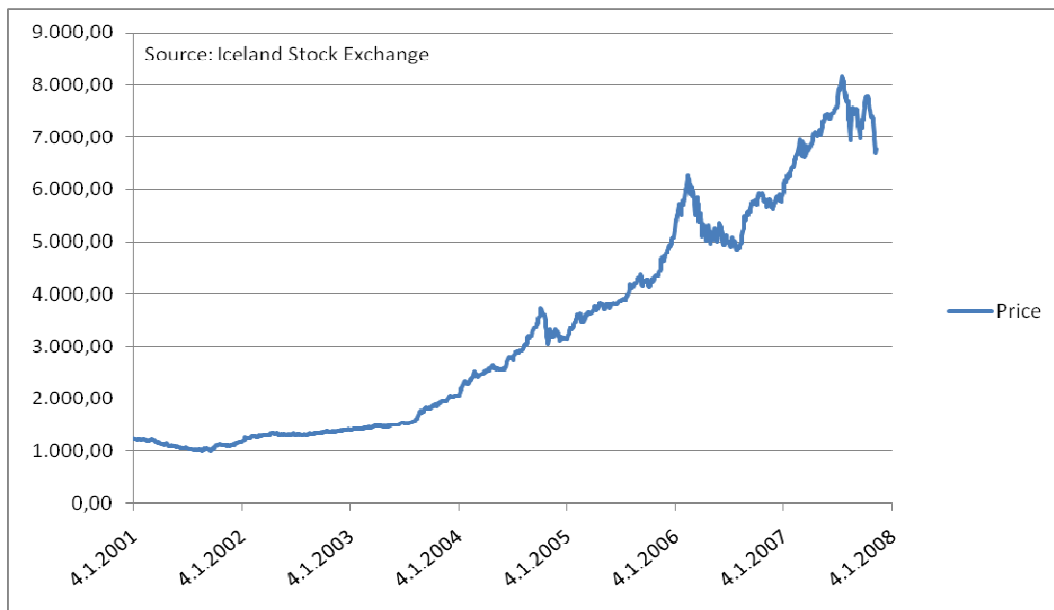


**Figure 16: Residential housing price index, capital area**

From Figure 16 it's obvious that there was a housing boom in Iceland from 2004 until 2008 when the housing market fell sharply when the credit expansion ceased. This boom in housing following a credit expansion is just what the ABCT predicts could happen when the new money flows into the economy. Then when the expansion of credit ceases the boom bursts and prices fall since there was no real savings behind the credit.

#### **4.1.4 Prices climb on the stock market**

The boom the Icelandic economy found itself in was evident in the stock market. The price of the OMX Iceland All-Share PI went from 1.261,61 on the fourth of January 2001 to its highest on the eighteenth of July in 2007 when the price reached 8.174,28.

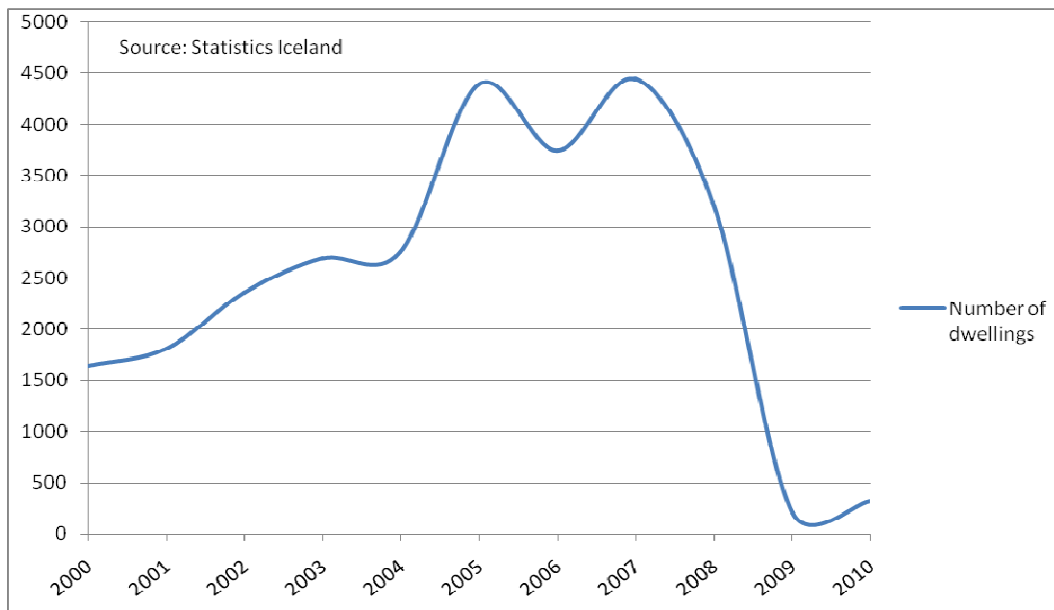


**Figure 17: OMX Iceland All-Share PI - 04.01.2001-12.11.2007 (unit: ISK)**

This rise in stock price should have been a clear sign of a bubble forming in the economy, it suggest that businesses are using increased leverage to pump up their share prices. As can be seen in Figure 17 the rise in the stock market started to take off in 2003, at the same time when the artificial credit expansion started. The ABCT states that following a credit expansion the prices climb on the stock market and as can be seen in Figure 17 that is exactly what happened in Iceland from 2004 through 2007.

#### **4.1.5 The productive structure is artificially lengthened**

The Austrian Business Cycle Theory predicts that low interest rates causes the productive structure to be lengthen, the credit expansion should cause businesses to take on more time consuming projects. In Iceland this longer productive structure was visible in housing construction. "Houses are a very capital-intensive good with lengthy periods of serviceableness. Decades, or even centuries, may expire before a house is consumed fully. Due to the length of the production and use processes, the construction sector is especially sensitive to interest rates". (Bagus and Howden, p. 55, 2011) Number of houses constructed each year had been increasing before 2004 but really took off after the banks entered the mortgages market. Figure 18 shows the number of houses constructed in Iceland from 2000 to 2010.



**Figure 18: Residential housing construction, number of dwellings**

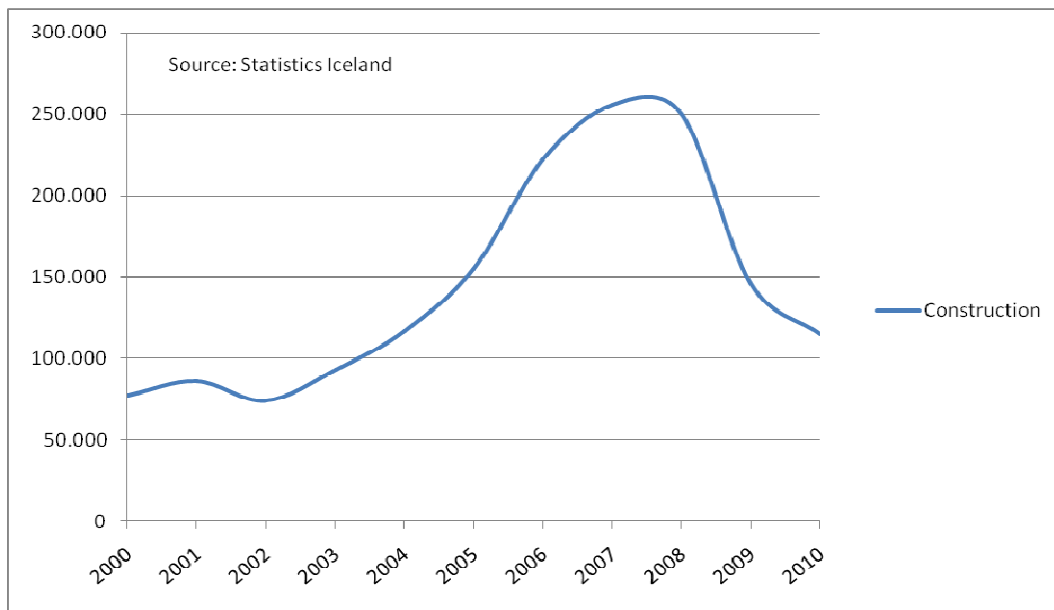
In 2005 number of constructed houses increased, from the year before, by almost two thousand dwellings. Number of constructed houses a year stayed high until 2008 when it fell; and by 2009 there were only 208 dwellings constructed.

At the same time that houses were being built at a faster rate in Iceland the government decided to build a large power plant to supply electricity to an aluminum smelter. Aluminum production is very time consuming and capital intensive process and depends on high savings and low interest rates, aluminum is also a major input in other capital intensive industries (Bagus and Howden, p. 54-55, 2011). This further sent more capital and labor to the construction industry bidding up prices in that field and lengthening the production process.

#### **4.1.6 Large accounting profits appear in the capital-goods sector**

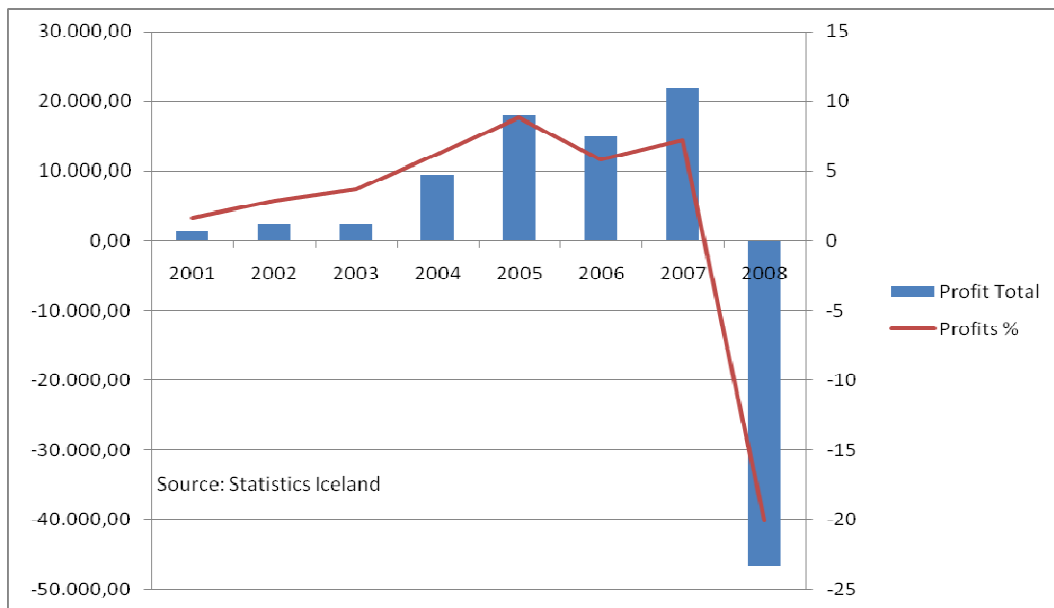
This increased activity in construction sent turnover in that industry skyrocketing. Total turnover more than doubled from 2004 to 2007 showing that there was a boom in construction. Figure 19 shows the total turnover in construction from 2000-2010.





**Figure 19: Total turnover in construction (unit: Million ISK)**

The ABCT doesn't just predict an increased activity in the capital-goods sector but also accounting profits. Profits from regular operation in construction more than trebled between 2003 and 2004, and profits more than doubled between 2004 and 2007. This increased profit in construction follows the Austrian theory that states that profits increase in the capital-goods sector during the expansion and boom face of the business cycle. The Austrians also predict that the capital-goods sector sustains heavy accounting losses when the crises hits and depression sets in. Figure 20 shows a graph of profits from regular operation in construction; it illustrates how profits increased until 2007 and then turned into heavy losses once the credit expansion ceased.



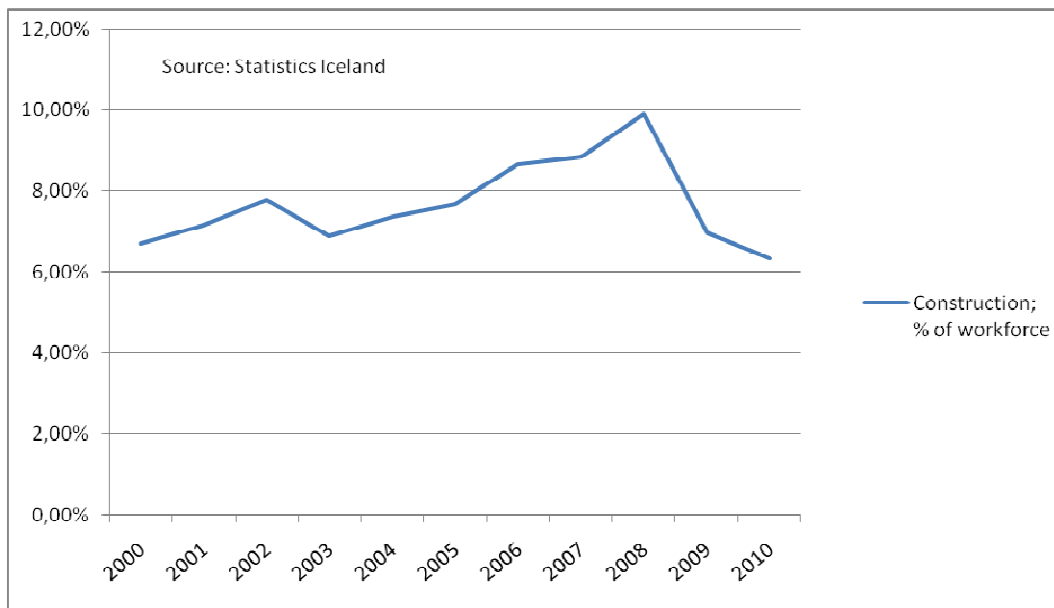
**Figure 20: Profit from regular operation – construction (unit left: million ISK, unit right: percent)**

All this increased activity and profits in construction started after 2003 and lasted until the banks went bankrupt. That seems to indicate that the boom in construction was being financed by credit that no real savings was behind. This boom then turned into a bust when the credit expansion ceased as the ABCT predicts.

## 4.2 Boom

### 4.2.1 The capital-goods sector demands more workers

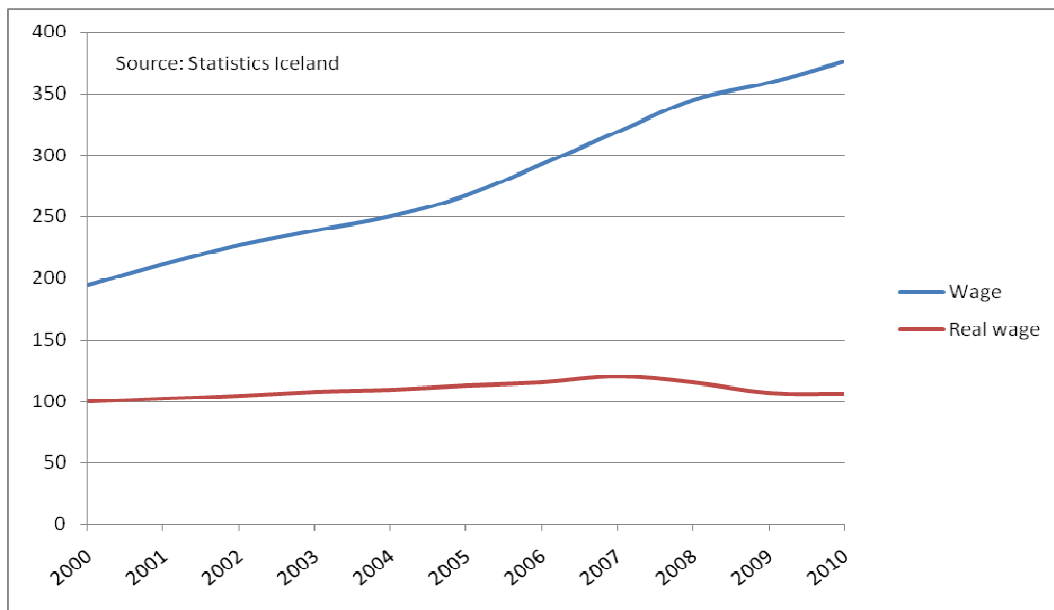
The increased activity in construction sent labor rushing to that sector as can be seen in Figure 21; which shows employed persons in construction as a percent of the total workforce. Construction workers went from being 6.71 percent of the workforce in 2000 to being 9.8 percent in 2008. This increase in the number of workers in construction is what the ABCT predicts what happens when the new money flows in the capital-goods sector and bids away workers. Also according to the theory; workers should be laid off in capital-goods industries after the depression hits, which is exactly what happened after 2008 when the percent of construction workers fell and ended in 2010 being lower than it was in 2000.



**Figure 21: Employed persons in construction as a percent of the total workforce (unit: percent)**

#### **4.2.2 Wage rise**

According to the Austrian theory wages should rise when the new money starts filtering through the economy, bidding up prices everywhere. The wage index rose from 194.1 points in 2000 to 375.8 points in 2010 (annual average). The real wage index started at 100 points in 2000 and was 106.1 in 2010 after peaking in 2007 at 119.6 points. Figure 22 shows the wage and the real wage indexes from the year 2000 until 2010, annual average.



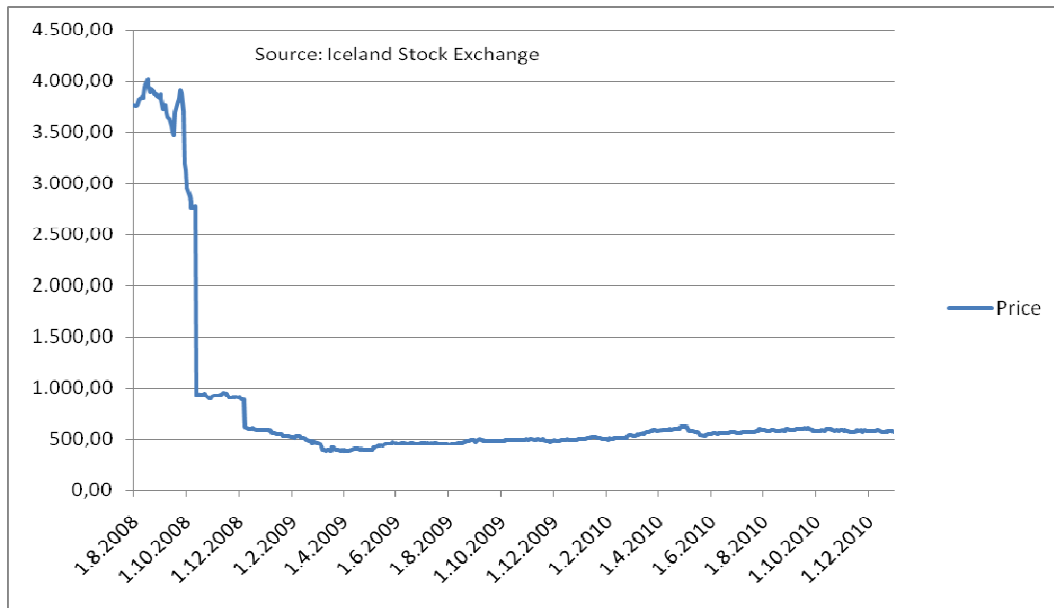
**Figure 22: Wage and real wage indexes, annual average**

From 2004 until 2008 the wage index increased by nearly thirty eight percent, at the same time the real wage index went up by only five point three percent. This indicates that the increase in wages was mostly offset by rising prices. After 2008 the wage index kept rising, at a slower rate though, but the real wage index fell. That is in accordance with what the Austrian theory states, after the crises hits and depression sets in prices start rising at a faster pace than wages causing wages to drop in real terms.

#### **4.2.3 The expansionary and stock market boom becomes widespread. Rampant speculation**

Before the crises face of the cycle hits the economy the expansionary boom should have become widespread. The spectacular rise in the stock market is a good indicator of the rampant speculation that was going on in the economy during the boom. Consumers' taking on debt in foreign currency is also evidence of speculation, average people were speculating on currencies, betting on that the ISK would stay strong against other currencies.

Figure 17 shows how the stock market rose until the end of the year 2007, Figure 23 on the other hand shows how the stock market crashed after the credit expansion ceased and the three major banks collapsed.



**Figure 23: OMX Iceland All-Share PI - 01.08.2008-30.12.2010 (unit: ISK)**

After the bankruptcy of the banks in October 2008 the stock market fell to under 1.000 ISK and as more businesses went bankrupt it went under 500 ISK. At the end of 2010 the stock market was still very low and had only risen to about 570 ISK which indicates that the prices of the firms in the stock market was held up by excessive leverage supplied by the credit expansion.

### 4.3 Crisis

#### 4.3.1 Credit Expansion Ceases

After the fall of the banks in 2008 the credit expansion came to an end and the economy went into a crises. As can be seen in Figure 23 the stock market crashed as de Soto's framework predicts it would. In Table 1 we see that the CBI interest rate started rising as the crisis started to set in.

#### 4.3.2 Wages

According to the ABCT real wages should fall after the credit expansion stops as prices starts to rise faster than wages. Figure 22 shows that after 2007 real wages start to fall even though nominal wages keep rising; this is what should happen after the crisis hits according to the ABCT.

## **4.4 Depression**

### **4.4.1 Losses in the Capital-goods Sector**

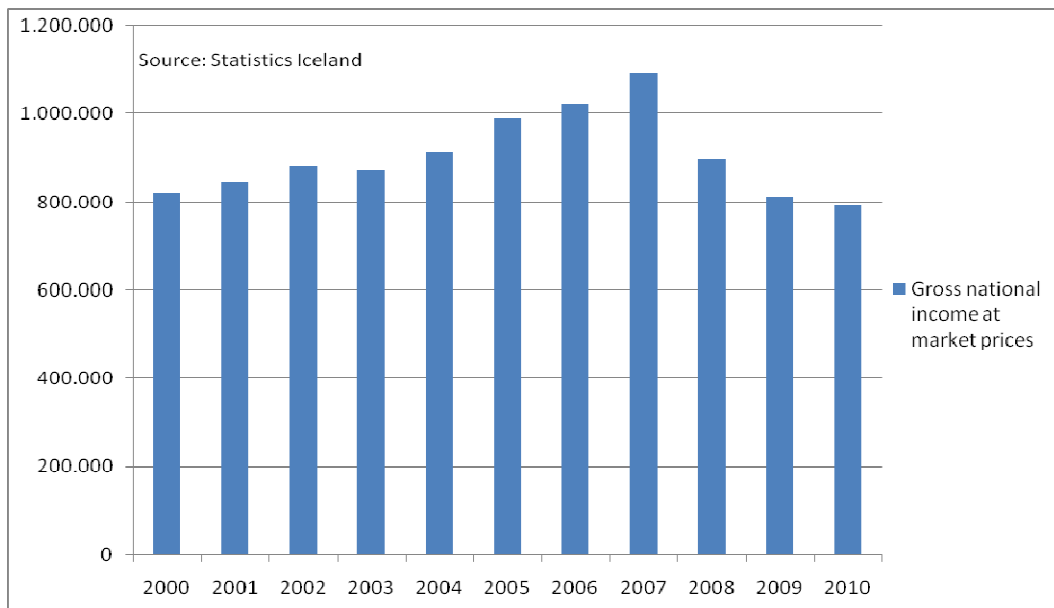
Figure 20 shows how profits from regular operations in the construction sector turned into losses in 2008. Figure 21 shows the fall in number of workers in constructions as a percent of the total workforce. This is exactly what the ABCT predicts should happen; also the fall in number of workers employed in construction indicates that workers are again employed in stages closer to consumption.

### **4.4.2 Banks Face Difficulties**

One of the scenarios in de Soto's framework under the depression stage is that bank default mounts and marginally less solvent banks face serious difficulties and there is a credit squeeze. In 2008 the three big banks went bankrupt and after that there was a credit squeeze, businesses and individuals started defaulting on their loans which put smaller banking institutions under pressure. In the months following the fall of the big banks many smaller banks came under pressure and had to be bailed out or went bankrupt themselves.

### **4.4.3 National income and wages drop in real terms.**

We have shown before how wages dropped in real terms after the year 2007 and Figure 24 shows how gross national income at market prices dropped also after 2007. The national income is at constant prices and the reference year being 2005.



**Figure 24: Gross national income at market prices (unit: million ISK)**

As can be seen in the figure the national income had fallen in 2010, after peaking in 2007, to a level lower than it was in 2000. This, like the fall in real wages, is in accordance with the ABCT.

## 5 Conclusions

Did the Icelandic economy go through an Austrian style business cycle? That is the question this research tries to answer. The hypotheses as it was laid out in chapter 3 is; are there empirical evidences that the Icelandic economy went through an Austrian style business cycle in the years from 2000 to 2010. To answer this question economic data are applied to a framework from the book “Money, Bank Credit, and Economic Cycles” by Jesús Huerta de Soto. The framework breaks the business cycle into 5 different stages, expansion, boom, crisis, depression and recovery. If the economic data shows that the economy went through these different stages, as they are described by the framework, we can conclude that Iceland went through an Austrian style business cycle.

The recovery stage of the cycle is excluded from this research since the Icelandic economy hadn't reached that stage in 2010. The crisis and depression stages are included but not as thoroughly as the first two stages since in 2010 the economy was still in the crisis/depression stage. The main focus is on the expansion and boom stages of the cycle, the crisis and depression stages are used to see if the investments made during the expansion and boom turned out to be malinvestments as the theory predicts they would.

### 5.1 Expansion Stage

The scenarios under the expansion stage are the following;

- Consumption does not decline.
- Banks grant new loans on a massive scale and the interest rate drops.
- Capital goods rise in price.
- Prices climb on the stock market.
- The productive structure is artificially lengthened.
- Large accounting profits appear in the capital-goods sector.



In chapter 4 economic data are applied to these scenarios, there we see that in the year 2003 consumption started to increase and at the same time saving in the economy stated to decrease. At the same period lending by the banking sector increased, it went up by more than two hundred and forty percent and businesses started to take on more debt. According to the Austrian theory interest rates don't have to come down from where they were before the expansion started, the expansion causes them to be lower than they would be were it not for the expansion of credit. Nominal interest rates were high during the period but as Bagus and Howden showed real interest rates were low because of high inflation numbers. During the expansion period banks started to issue loans dominated in foreign currencies with much lower interest rates, setting rates lower for consumers and businesses.

The data also show how the money supply (M1, M2 and M3) increased during the period, especially after 2006. With increasing money supply the CPI started increasing as the new money started to filter through the economy and bidding up prices. According the de Soto's framework capital good prices should then start to rise, that was evident in the housing sector where prices started to rise at a fast rate in 2004 when the banks stated to offer mortgages at a lower rate than the HFF. A boom was also evident in the stock market where the OMX Iceland All-Share PI started to rise at a fast rate in mid year 2003.

The lengthening of the productive structure was clear in construction after the banks entered the mortgage market; number of dwellings constructed skyrocketed after 2004. Both turnover and profits in the construction sector rose substantially after 2004.

The data shows that the economy followed in the path of the expansion stage of the framework, starting around the year 2003 with expansion of credit not back by prior saving in the economy.

## **5.2 Boom Stage**

The scenarios under the boom stage are the following;

- The capital-goods sector demands more workers.
- Wages rise.

- The expansionary and stock market boom becomes widespread. Rampant speculation.

In the year 2000 construction workers were 6.71 percent of the workforce but by 2008 they were 9.8 percent. This rise in workers in construction started in 2004, the same time as the housing boom. The wage index was rising from 2000 but started to rise at a faster rate in 2004. Between 2004 and 2008 the index increased by nearly thirty eight percent.

De Soto's framework states that the stock market boom becomes widespread and there is rampant speculation. The stock market boom was there to be seen by all as Figure 17 shows. Figure 23 then shows how the stock market crashed after the banks failed and other businesses in the OMX went bankrupt, indicating that there wasn't much more than a credit expansion fueling the stock market boom. The rampant speculation was also evident in the fact that average people were gambling on currencies by taking on debt dominated in foreign currencies.

In the boom stage of the cycle; the data shows that the credit expansion caused the Icelandic economy to go through the scenarios under the boom stage that the de Soto's framework predicts it would go through.

### **5.3 Crisis/Depression Stages**

The framework lists many scenarios under the crisis and depression stages of the cycle, not all of them are included in this research for reasons mentioned before. Scenarios taken into account in the crisis stage are that the credit expansion ceases causing the stock market to crash. Wages start to rise at a slower rate than prices of consumer goods as can be seen in Figure 22 where real wages can be seen decreasing from the year 2008 though nominal wages are rising.

In the depression stage we see that capital goods sector sustains heavy losses and workers are laid off, that is evident in the construction sector. Banks face difficulties, the three big banks went bankrupt in 2008 and in the months after that other smaller banks got into trouble and also went bankrupt or were bailed out. GDP started decreasing in 2008 and in 2010 it was at a lower level than it was in the year 2000.

Data from the years 2008 till 2010 show that the scenarios under the crisis and depression stages had started to materialize, indicating that investments and decisions

made during the expansion and boom were indeed malinvestments. That further indicates that it was an Austrian business cycle that the economy was going through.

#### **5.4 Summary**

Are there empirical evidences that the Icelandic economy went through an Austrian style business cycle in the years from 2000 to 2010? In short, yes. The economic data shows that under the expansion and boom stage each scenario materialized in one way or another. The data also show that after the crisis hit in 2008, scenarios under the crisis and depression stages started to materialize. From this the conclusion has to be made that the Icelandic economy went through an Austrian business cycle, starting around the year 2003 with an expansion of credit not backed by real savings.

#### **5.5 Final Thoughts**

The evidence seems to suggest that the Icelandic boom bust cycle was a typical Austrian business cycle. What lessons, if any, can be taken from that conclusion? The first is that further, more detailed, research is warranted on the Icelandic business cycle through the eyes of the Austrian school. Today the discussion about the economic crisis is one sided, the emphasis is on the banking failure and that is the cause of our troubles. A study on the boom part of the cycle is needed, to see if the mistakes were made during that stage and the recession is the cure were the malinvestments are liquidated and the economy is put on a sustainable path again.

The second lesson, and related to the first, is that the Austrian school and their business cycle theory could be better and more widely understood, especially by students in economic and business. The Austrian Business Cycle Theory and their theory on capital structure can be valuable tools for students in economic and business/finance and a useful addition to their curriculum.

Almost nobody knows what you are talking about when you bring up the Austrian school in discussions about economics. People, and students especially, should be exposed to as many schools of thoughts as possible instead of the teaching being limited to one school of thought; exposure to as many ideas as possible encourages critical thinking by individual students. The University should lead the study and discussion about the current economic crisis and every possibility should be on the

table. That being said; this research doesn't proof that the Austrian school has the all the right theories and that it should be the only school of thought taught at universities. At the moment the Austrian school is totally excluded from the curriculum at universities and doesn't get any attention and therefore no researches are being done based on Austrian theories. At least, especially with as strong a conclusion as from this research, the Austrian school deserves a place at the table in economic discussion and research at universities.

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