THE IMPACT OF DEFLATION ON ECONOMY

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THESIS SUBMITTED FOR THE DEGREE OF MASTER OF SCIENCE

IN

BANKING AND FINANCE

EPOKA UNIVERSITY

JANUARY, 2017

APPROVAL PAGE

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THE IMPACT OF DEFLATION ON ECONOMY

ABSTRACT

This study analyzes the effect of deflation on economy. Data includes main macroeconomic indicators such as; GDP growth, interest rate, unemployment rate and inflation which are obtained from International Monetary Fund web page for the period between 1986 and 2013. Deflation in Japan was present for a long-lasting time since the latter half of 1994. Descriptive statistics and multiple regression methods are employed for two sub-periods to highlight the impact of inflation on the Economy of Japan. Estimates of a standard Phillips curve indicate inverse relationship between inflation and unemployment especially during deflation.

Keywords: Deflation, GDP, unemployment rate, interest rate.

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ABSTRAKT

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DECLARATION

I hereby declare that this Master's Thesis titled "The Impact of Deflation on Economy" is based on my original work except quotations and citations which have been duly acknowledged. I also declare that this thesis has not been previously or concurrently submitted for the award of any degree, at Epoka University, any other University or Institution.

SaidaLekaj
January 27,2017

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LIST OF ABBREVIATIONS

GDP	Gross Domestic Product
PBB	Produkti I BrendshemBruto
EU	European Union
US	United States
BoA	Bank of Albania
BoJ	Bank of Japan
CPI	Consumer Price Index
PPI	Producer Price Index
INSTAT	InstitutiShqiptar I Statistikave

CHAPTER 1

INTRODUCTION

This study will analyze the impact of deflation on the economy. The case study is based on the events in Japan since it is the most essential example to explain a deflationary situation that happened for two decades. I will examine the relationship between interest rate, inflation rate, unemployment rate and GDP. Descriptive analysis is used to focus in each of the data chosen for the study, while regression analysis will estimate the relationship between the data.

1.1 Definition

Deflation is the process of decreasing average prices, below the level of the previous period. It can also be defined as negative inflation. So deflation is the opposite of inflation and it represents monetary imbalance. This monetary imbalance during inflation represents a higher circulation of money than it is necessary, while during deflation there is less money circulation than needed. This is the main difference between inflation and deflation. Inflation is considered as a decrease of purchasing power, and deflation is considered as an increase of purchasing power. The best example is The Great Depression when unemployment was high and people couldn't afford to buy anything at any price.

1.1.1 How is it measured?

When interest rates fall below zero, this causes changes in Consumer Price Index, which shows deflation problems. CPI is a good measure for any changes in cost of living. It measures the cost of a basket of goods and services consumed by a typical family during a certain period of time. When measuring CPI, it is also considered the specific weight of any good or service in the expenditure budget of a consumer.

PPI is the supplier price index that measures the level of wholesale prices, so the level of prices at the producing phase. In the US this index is calculated based on the prices of 3400 different prices. Calculating the PPI is important due to the wide range of goods and services it involves. It is commonly used in commercial activity.

GNP deflator is calculated as the division of nominal GNP by real GNP, in percentage.
GNP deflator = (Nominal GNP/Real GNP)* 100
This calculation may be interpreted as a more general price index, since it comprises the prices of a wide range of goods and services. That is why the economists believe that GNP deflator is a better measure of deflation than CPI and PPI.

1.1.2 Cause of deflation

According to the IS/LM modelthe shift of the supply and demand curve for goods and services, causes deflation. This is the case when the demand curve shifts to the left and overall prices fall. Consequently buyers expect that the price falls further and so they consume less. This slows the overall economic activity, increases unemployment, and reduces investment. This results into a vicious cycle known as deflationary spiral, where the aggregate demand decreases continuously. According to the monetarist theory: Money Supply * Velocity of Money=Price level*Output
So a decrease in money supply or velocity of money causes deflation, in case there is no other change that can offset this decrease.

1.1.3 Problems with deflation

The decrease in aggregate demand by falling prices slows consumption. Consumers expect to have cheaper prices, so they wait for the prices to decrease. Lower consumer spending leads to lower economic growth. Firms will be making less profit and they will lower the wages or cut off employees. During deflation the real value of money increases by increasing the real value of debt. So this is a bad situation for borrowers, because they have to pay more money for their debt obligations. There is less money for consumption and less money for investment. During this recessionary period saving money can bring a good return, since interest rates cannot fall below zero. If deflation is 3%, then the real interest rate is +3%. Deflation is very difficult to end as a process. Prices and wages also are difficult to adjust during this process.

1.2Research objectives

In this study I will demonstrate a real deflationary situation in Japan since it is the most popular country to face such a phenomenon for such a long time. The objectives of this study are:

- To analyze the impact of deflation on economy in Japan,
- To analyze the changes in the relationship before deflation and during deflation.

1.3 The asset price bubble

During the 1980s the Japanese economy suffered from an asset price bubble.[1] The main factors of this situation were currency war, monetary easing, credit expansion and euphoria. During the 1970s Japan was having a good industrial development in electronics. Their businesses started to spread outside the borders of Japan, by increasing in an expansionary pace. At this point Japan was crowned as the "King of the Global Electronics Industry". This rapid economic development brought a fast increase in the

[1] http://www.bis.org/publ/bppdf/bispap21e.pdf

standards of living thus labelling this period as the "Economic Miracle". People were being very optimistic about their economy as it was very strong and this led them to euphoria, which started a trend of investing. In 1985 Americans were aware of their currency being too high, which lowered their competitiveness. The Americans announced that they decided to interfere in the currency market by signing the Plaza Accord with Germany, England, France and Japan. Japanese yen started to increase its value continuously turning from 1dollar to 220 yen to 1 dollar to 150 yen in a short period of time. This drew back the investors who had made investment in the American bond market, because of near American government acquaintance shortage. That is why investors turned to Japan by channelling a great amount of capital there, in order not to be attacked by the financial crisis. As the yen value kept on rising, the net fare had fallen which constrained the Bank of Japan to utilize low loan cost arrangement and financial facilitating. This increased the need for investment in Japan, by slowly causing the creation of the bubble. The increase in investment caused an increase in the stock market and in the value of land. People believed the myth that the value of land would not decrease but only increase yearly. The value of land in Tokyo only, could buy the whole territory of America. On the other hand, banks were interested in lending more to gain profit so their boundaries of loan regulations were loosen a bit and many loans were given to people who owned a piece of land. This cycle continued for four years until it reached the peak, where the value of land couldn't raise any longer. The country was in the middle of an asset bubble price.

An important and urgent measure to be considered by the BOJ was to tighten the monetary policy, but this caused the bubble to crash. The Nikkei index fell from the vertex point to less than half of it in less than a year. The land value followed the fast decline quickly. Eventually this would cause a serious damage to the banking sector which used land as collateral against loan giving. Damage in the banking sector would weaken the economic system, too. People became panicked and there was no more interest on investing. They wanted to pull out from the market. Investments were focused outside the country while Japan's manufacturing technological firms weren't at their peak anymore. Eventually, demand for Japanese products was decreased and their products weren't strong in their

competition. Consumption was lowered while the economy was experiencing a deflationary spiral. Companies either went bankrupt or were holding themselves from government subsidies. The burst of the bubble contributed to what is called the "Lost Decade". The Japanese government claimed it was needed ten years to recover the economy to the level before the bubble.

1.4 Deflation in Japan[2]

Deflation started in 1990. The Bank of Japan tried to use quantitative easing policy by lowering interest rates in order to reduce the damage in the economy. However these lowered interest rates couldn't stop deflation. The fallen asset prices were a major problem that caused deflation.

Deflation in Japan is the main reason why Japan has the highest government debt burden in the world. Once the economy falls into deflation is hard for policymakers to pull it out. Central banks try to stimulate the economy by cutting the interest rates below the inflation rate but it is hard to put interest rates below zero.

At the end of World War II Japan was almost literally bombed back to the stone age (Otsubo, 2007).American bombs attacked Hiroshima, Nagasaki and also other cities like Tokyo. This affected in a tragic way the economy. In a more detailed meaning, unemployment rate was increased, food was limited, the industry was not working well and production was decreasing too. However Japan was provided with hard working people who invested in the recovery of the country. The bad situation ended during 1950s. An important factor was the Korean War. After the 50s Japan experienced an economic recovery. During the 60s happened the event that was also known as the "Miracle Economy". During this time, Japan had an increase of over 10% a year.

This backs up the idea that the Japanese protected their home markets while wage economic war abroad launching vigorous export drives. Other scholars appointed to

[2] http://www.imes.boj.or.jp/english/publication/edps/2003/03-E-15.pdf

Japan's human resources, well-trained diligent workers, its able managers, its cooperative unionists. Japan has been considered of having a free-ride on the path to prosperity, essentially because America picked up the bill for Japanese defense during the hottest days of the Cold War. Japan harbored under the US nuclear umbrella during the Cold War and spent a very small percentage of its own money on its defense. A number of scholars have also appointed to the open world trading system after World War 2 as an important component of Japan's success. In essence Japan was able to take advantage of the free trade regime to sell its products abroad and have easy access to the resources it needed. It has no petroleum reserves so it had to import all of its oil and many of its raw materials and this open world trading system facilitated that process. Entrepreneurship and leadership also need to be mentioned, although traditionally Japan has been considered as a terrible entrepreneurial country. In fact comparative studies often showed it as one of the least entrepreneurial countries in the world. In fact the record of Japanese firms since World War 2 is very strong. These entrepreneurial firms include a household name like Sony, Honda. Nintendo. This energy of innovation and entrepreneurship really helped build the Japanese economy. In recent years many economists have finally begun to acknowledge that it may actually have been one of the most important factors in japans economic boom at the 1950s and 1960s. The Japanese are usually depicted as some of the world's greatest savers but they have also proven to be some of the world'sforemost spenders. This was proven during the decades immediately after ww2, when japans consumers apparently compensating for the hardships, and deprivations of the war years bought at an unprecedented pace. America believed that japan was an export-driven economy while during those years a very rapid economic growth a majority of it came from domestic consumption and domestic investment. Much attention has been given to the role of the government bureaucracy in Japan's high-growth economy. State industrial policy as it was called charted largely within the Ministry of International Trade and industry and carried out cooperatively with major corporations provided a strategic plan and central guidance for japans economic rise. The scholar who introduced this idea is Chalmers Johnson, who described japan as a developmental state. This is a prototype of the kind of government that we have seen recently in high growth economies like in Singapore, South Korea, Taiwan and China. The basic idea is that the government did not

just sit back and watch the economy grow or regulate business during the miracle economy years. The government was acting like the general in the playing field helping to coordinate and lead the economy in private industry in certain ways to maximize the nation's economic growth. Many scholars have also placed a great deal of emphasis on the unique structural features of the Japanese economy during the high growth era. Essentially distinctive ways of doing things in Japan like industrial policy that ended up supporting rapid economic growth.

First there is the Japanese employment system. In Japan the traditional model is that when you graduated from high school or college, you would be recruited by a firm and then work for that one firm until retirement age. So from 18-21 years old until mid-fifties, you would be constantly promoted upwards and your salary would rise based on seniority. This was considered to be a good deal for Japanese workers, since they had complete job security, they had a guarantee on rising incomes and increasing influence within the firm and then in return on of the things that workers gave was that they ceded any kind of political role on their company to their bosses. Company unions became the norm so labor cooperated with management and generally had a very friendly relationship with management rather than an antagonistic one. The outcome was that Japan had a very content work force, very little labor on rest and a workforce that became a very good source of investment because these workers were already working in their country in one firm during their entire careers and things like training became very good payoffs for Japanese companies.

The Keiretsu system is another aspect of the postwar Japanese economy. In other words it would be translated as conglomerates or financial groupings of Japanese corporations after World War 2. They were generally organized around large banks and each large bank would have a constellation of firms associated with it. These firms would expand the industries. They informally supported each other financially, managerially and through purchase of each other's products to build themselves. This is a legacy of the prewar structure in Japan where there are very large conglomerates in Japanese society that are banded together to concentrate financial assets at a time where there wasn't a lot of capital

in Japan. This persisted though after world war 2 and became one of the distinctive features of the Japanese economy and we see this in other Asian economies like in South Korea where there are very similar kinds of industrial financial groupings in place today. The Keiretsu framework identifies with the arrangement of corporate fund and banking like during post-war Japanese economy. During this period, security markets in Japan were not used generally to increase funds for corporations. When a corporation needed resources to make investment on a new place or equipment they would go to the bank in their keiretsu. Consequently they would get bank loans in order to use the funds they needed. The system gave tremendous power to banks needless to say since they were the ones to inject the capital into the system. It likewise gave colossal energy to the state and this is to a great extent the path in which mechanical strategy was controlled in Japan in light of the fact that as the banks controls the stream of money to assembling firms so the state controlled the stream of assets to banks and affected the way banks allotted those assets. As opposed to a market-oriented structure, where firms would go to the equity markets, raise capital and invested and therefore be a little bit further for outside the control of the government, banks had a lot of authority and the government had a lot of control of how the economy was developing.

1.5 How did the bubble get worse?

The BOJ was not on top of the bubble that it got too outsized, sooner than imagined and some control in monetary policy could have prevented Japan from the fail. However, it still would exist a bubble, there still would have been bad, but it could be prevented the seriousness of the damage. Bank of Japan needed to be more active in deflating it sooner. Then when they did deflate Japan, if they had made it smother than putting on the brakes quite as hard as they did, it could be better for the economic future. So mistakes were made by the Bank of Japan in allowing the bubble to get so large and then bringing it down.

Controllers in Japan were not exactly as autonomous as they could have been. Actually numerous officials, huge numbers of the general population controlling the saving money framework and the share trading system were in the pocket of or if nothing else under

obligation to financiers and representatives. The retirement age in Japan is generally 55 and when you are a bureaucrat in Japan, like the Ministry of Finance and your age is 55, you are looking for a good job, and bureaucrats are highly paid in Japan so they want to enjoy their lucrative career after they retire. In case of the Ministry of Finance this means that you will go work for one of the big Japanese banks. What we have is a situation where bankers through much of their careers are angling to make good relationships in the banks so they can be hired in the banks when they retire. In turn the banks are populated by former bureaucrats who know the ins and outs of the system. What we have is an ingrown inbred system where no real regulation was taking place. What made this particularly nasty in the late 1980s was that the organized crime, the Japanese mob yakusa, became very involved especially in real estate dealings. During this time the mob has been involved in more traditional gangster activities like prostitution, drug dealing, loan sharking but they realized that in the late 1980s the real money was in property development. So they began to get very involved in land speculation and became very closely integrated into some of Japan's major banks. A number of Japanese banks were willing to turn a blind eye to this. They wanted to make money, they needed a new way to make money once they lost a number of their big corporate clients for loans and in any case there was a long history of regulatory oversight so banks could get away with it without being worried about the regulators, the government or even their shareholders. In Japan shareholders have little power in Japanese corporations, so there was no supervision from that angle either.

During these bubble situations, people see money as easy, money seems to be get money, even if you don't have money you can make money and this could clearly define Japan in the late 1980s.

One of the major mistakes that were made was the idea that Japan was different and that didn't need to apply the neoclassical rules of economics.

No one in Japan could believe that land in Japan would be a bad investment. It was impossible to believe that you would ever lose money on a land deal, while families were

busy signing 120 year mortgages because houses were so expensive, you couldn't possibly pay for them over one lifetime so your kids had to pay for them too. Even during this situation people thought it's a good investment deal because land just keeps getting more valuable. People also believed that the Japanese economic experience since World War II showed that even when the global economy was at its worst during the oil shocks, the Japanese found the way to come back and so they felt that they were somehow special. People have this irrational belief that is present in every bubble economy that is they believe it will last forever.

1.6 Consequences of the bubble

The peak was on the last day of the late1980s. In 1989 the Nikkei index which is the index for the Tokyo Stock Exchange hit a record of over 39000. Within two years it fell to14000 and it decreased to 8000 over a decade later. The loss was nearly 80% of its value. Land costs followed a comparative direction. In the 1990s, Japanese financial specialists and landlords saw 2.5 trillion dollars in the estimation of their advantages basically vanish. Observers portrayed the 1990s as Japan's period of vanishing riches where an era of wealth creation could dissipate in a matter of weeks. The emergency which started in monetary and land showcases rapidly affected the whole economy. The development rate fell sharply from 3.1% in 1991 to 0.4% in 1992 and 0.3% in 1993. During this time Japan really experienced negative development. Partnerships saved pruning costs, shedding excess specialists, and channeling work that costs high abroad particularly to China and Southeast Asia where work costs low. This led to unemployment, which was unknown in Japan since the period of occupation. Unemployment rate reached 5.5% in 2003. As indicated by financial experts the real rate of unemployment was near 9%. The managing an account division was hard-hit by Japan's monetary burdens as money related foundations were saddled with an enormous volume of uncollectible advances after the land bust. The 1990s saw debilitate arrangement of bank disappointments, rearrangements and mergers.

In 2006 and 2007 prices went up in the real estate market in Japan and this was considered miraculous. Since 1990 the economy has been stagnant. In near terms, Japan's monetary stagnation has been remarkable. For instance Japan's share of world GDP crested in 1991 at 9%. It was anticipated that in 2001 Japan's share of world GDP would therapist to just 6%. As far as relative ways of life in 1991, Japan's genuine per capita GDP had achieved 90% of US levels. By 2001 Japan had fallen to 76% of the American benchmark. Troubled with overabundance limit from an excessively idealistic venture blast in the 1980s, businesses needed to disarrange to cut costs, shed repetitive specialists and move high cost creation abroad. Trade ventures like gadgets, the vehicle business and hardware keep on being relative brilliant spots in the general monetary situation for Japan. However these make up just a little part of the bigger Japanese economy to great degree productive mechanically refined areas and unexpectedly are the segments that have been the most forceful in sending out occupations as of late.

Many firms and businesses in Japan especially on the base portion of the double economy so particularly little makers, the administration segment, development, conveyance and retailing, these littler firms are by and large not aggressive by worldwide guidelines and their profitability frequently lingers behind American benchmarks by half or more. So for instance in single-family home development Japanese profitability is about 33% of US levels to a great extent because of the absence of institutionalization. By far most of Japanese homes are still constructed utilizing the conventional post and bar technique where there can be up to 150 unique measurements of standard wood. Such wasteful aspects furnished the protected local segments of the Japanese economy.

1.7 Banking sector

The most depressing part of the most depressing economy in the developed world is the banking sector. Indeed, Japan kept on asserting a few of the biggest relies upon the globe, referred to banks. However investigators concurred that for all intents and purposes the greater part of Japan's banks was in fact wiped out. In spite bookkeeping methods and indulgent government directions kept them legitimately above water. Autonomous

spectators set the estimation of awful or questionable advances on the books of Japanese banks at 100 to 150 trillion yen. Such figures meant 20 to 30% of Japanese GDP implying essentially that Japan's heating emergency was exceptional among other major modern countries.

The Japanese were reasonable in tending to the terrible obligation issue and they just truly pumped the assets vital into banks to begin clearing up their accounting reports after the begin of the new thousand years. One method followed by the Japanese government in 2003 was putting up huge amounts of cash into banks to recapitalize, to manageput away obligations of their accounting report.

Another issue during the Lost Decade was a portion of the basic characteristics of the Japanese monetary framework which intended to convey high development. This functioned admirably in the 1960s demonstrated unbelievably unbendable binding and oppressive in a period of financial stagnation. In this manner the arrangement of changeless work and the rank framework made it hard for organizations to modify proficiently to declining request. The great connections of the banks and similar firms in keiretsu implied that advances kept on being given to subsidiary companies regardless of the possibility that those enterprises were not practical or even near dissolvable.

There were a lot of zombie companies in Japan in 1990 and because of bank’s historic relationship with them they continued to give them loans, but the banks were essentially doing no business, they were just surviving on paper. So these structural peculiarities of the Japanese economy became a drag on the system.

The savings rate in Japan at the beginning of the Lost Decade went higher than before. People hoarded their money and in many cases they pulled them out of commercial banks, because they thought these commercial banks were unstable. This actually made the situation worse for the banks because their deposit levels were going down. People instead chose to put their money either into their mattresses or else they put it into the safest financial institutions which were the government financial institutions. So the post office

is the biggest financial institution in Japan. Post office savings has more deposits than any bank in Japan and during the worst times of the Lost Decade people simply put their money in the post office. This essentially was facilitating the government's fiscal policy because this gave the government more money to go out and spend on useless highways, bridges and dams. This was a very bad circle.

The one thing the Japanese people were not doing was spending. Consumption went way down in the Lost Decade and one thing that all the economists, particularly American economists were saying that the only way for the Japanese to get out of this is to spend money and to grow the economy from the inside. No matter what the Japanese state did, the Japanese were stuck on their money and wouldn't spend them. Every time it looked like there was a boom in consumption it just turned out that it was a cyclical effect. After a certain amount of time, 8 or 10 years, people need to buy new refrigerators and washing machines and cars. So they would buy them and the economy would look better, then the people would restock their money and consumption would go back to where it was. In other words private sector consumption which looked like it could be the rescue for the Japanese economy, never came through.

1.8 Government Measures

The Japanese government did not simply remain back and watch the economy go down. In the course of recent years the Japanese government has tried different things with all the time respected financial and money related solutions for haul the economy out of the retreat. From all the course reading arrangements that Japan's government officials and civil servants have thought of, the Japanese economy has reliably demonstrated itself unyieldingly inert. For example over the 1990s the focal government barely grasped the Keynesian solution for a droop increase open work spending and infusing floods of new cash into the economy. Such monetary jolt didn't have transient beneficial outcomes however regardless of what number of new and typically superfluous extensions and expressways the legislature made, long haul financial restoration stayed subtle.

What has made matters even worse is that Japan's Keynesian solution gone wrong, has led to a staggering problem of national debt (Mishkin & Takatoshi, 2004). Following quite a while of striding the United States for its financial flightiness Japan has needed to confront an even direr circumstance. Two decades of level duty incomes and frantic pump preparing spending has left the Japanese government profoundly in the red. Japan's gross national obligation is currently around 180% of its GDP, while its yearly spending shortfall is around 9% of GDP and obligation support costs have achieved 12% of the focal government's aggregate yearly uses. This level of obligation is in relative terms all in all the most elevated in the modern world today. All the world's driving FICO score offices downsized Japan's sovereign obligation appraisals toward the begin of the decade to the degree the Japanese government bonds have now and again conveyed a lower rating than Botswana's. In addition to the fact that this is mortifying for Japan such a stunning level of national obligation is over the long haul possibly extremely destabilizing for the universal economy. Money related strategy has likewise been utilized as a part of pretty much routine approaches to attempt and stir Japan from its monetary circumstance.

The expansionary fiscal strategy that has been utilized, has likewise neglected to infuse new life into the Japanese economy. The low loan cost approach has permitted the legislature to oversee at any rate until further notice, the enormous national obligation load. It has likewise brought on pressures in different parts of the economy and society. Low loan fees for instance have put significant weight on retirees, huge numbers of whom are reliant on intrigue salary from investment accounts. Insurance agencies and benefits reserves have additionally been crushed. By 2001 six major safety net providers and more than a hundred annuity arranges had gone stomach up not able to manage an ensured 5 to 6 percent payout on a miniscule profits they were accepting for speculation. A few financial experts today were concerned that all Japan's private annuity assets were basically bankrupt and won't have the capacity to cover their commitments over the long haul.

1.9 Case of Albania

Considering the long-term deflationary period of Japan, let's see the possible upcoming situation in Albania. Albania has an economic growth of 2.7%, but it suffers from supply shocks and reduced consumption. Our country does not have the proper performance of revenue growth; also it does not have enough growth of credit, investment and increase in quality of spending in the economy. We have economic growth, and we have a lot of legalization of "illegal work", but do not have much real jobs, because we have vacancies, but we have no skilled professional workforce.

The government is implementing a fiscal policy, but apparently not properly aligned with monetary policy. The government has control over the budget deficit and it is applying a program towards debt reduction.

The country is going through a process of rapid disinflation, a slippage toward zero inflation, to a deflation threshold.

The question is why? Naturally, many factors are inherited, but internal economic developments, the expectations of the outcome of reforms that are being taken, and external factors and developments in international markets, are factors that have a major influence in our economy.

According to the most recent economic thinking, deflation is associated with risk, where return of risk from assets decreases in negative numbers. Investors and buyers will gather the national currency in the country to invest it in the securities market. Such a phenomenon can create a "liquidity trap" or may lead to shortages that attract investment by reducing the number of jobs and production. In an open economy, deflation creates a carry trade, and devalues the currency. A devalued currency leads to higher prices for imports, without necessarily stimulating exports on a large scale. However, deflation is the natural condition for economies that have difficulties in currency, when the supply of money does not grow as fast as the population and economy. When the supply of money

is low, the available amount of currency in circulation decreaseswhich leads to a higher purchasing power. In large open economies, deflation can also be caused by a combination of demand and supply of goods with the supply and demand for money, especially when the money supply decreases and supply of goods increases. Historical episodes of deflation are often associated with increased supply of goods (due to productivity growth) without an increase in the money supply (as the Great Depression and possibly Japan in the early 1990s). Studies of the Great Depression by (Bernanke B. , 1994)have shown that, in response to the reduced demand, the Federal Reserve decreased money supply, contributing to deflation. We also encounter with the bank credit deflation. This is because of lower credit supply by banks, because of bank disappointments, or increment of the impression of hazard from private subjects, or subsequently of a constriction of the cash supply by the national bank. Additionally, by a monetarist point of view, collapse is created principally by a diminishment in cash speed, or the measure of cash supply per individual. However authentic examination of cash speed and money related base, have demonstrated a reverse connection. For a specific rate decrease in the financial base, the outcome is the expansion in an equivalent rate of cash speed. Notwithstanding, truly not all scenes of flattening compare to times of frail monetary development.

1.9.1 Factors, Causes and Consequences

INSTAT confirmed a significant decline in inflation, which in February reached a level of 0.2% (INSTAT, 2016). What are the factors and causes of this development? First, although the curve of the economic growth is already marked, it seems that this important factor is still below its potential growth and its capacity.

(BOA, 2016)stated that: "Although the analysis has shown that the decline in inflation does not appear to have come from unexpected decline in consumer demand and in this period, it is nevertheless clear the level of growth and aggregate demand remain below levels their potential and continue to restrain inflation to return to target ".

Second, supply shocks are also a significant factor for the situation. This is directly related with the transfer of negative inflation from abroad; especially through import of food (around 50% of food is imported). The crisis in the euro zone and our export-import relationship with leading European partners would also have an impact in our economy. According to BoA food inflation is also influenced by our trading partners, hovering at low levels. "Food inflation in January in four main trading partner countries was only at 0.25%, against an average rate of food inflation of 3.1% during January-February period in Albania, " (BOA, 2016) stated. The Central Bank admits that because of trade activity with these countries, this low inflation tends to be spread in Albanian economy. On the other hand, the decline in oil prices in international markets (estimates are that it will continue until the end of 6 months) has its visible impact in such situations. Another impact is the decline (shrink) of consumption, especially by the lack of money and as a result of the fast decline in remittances (the situation in Greece and Italy). The business was affected in some way from fiscal policies. Fourth, there was a lack of prompt reaction in 2011-2012 (at the peak of the crisis) to increase the flexibility of monetary policy (rigid interest rate policy of BoA at that period). Finally, the connection between politics and economy is prominently displayed, by the decrease of confidence in the economy. Stricter political life not only in Albania but also in the region would also have a negative impact in the economy. Uncontrolled decline of annual inflation rate represents serious warning of the dangerous period of deflation. A few years ago the president of the IMF, Christine Legarde, warned the world economy about the risk of "Japanisation" of the European economy (Polak, 2014). It meant for the risk of deflation. The consequences of a disinflationary situation with a deflation tendency affect our economy as a whole, the climate of business development in the country, and the living standards of citizens. This happens because deflation is a sustained decline in all the levels of consumer prices. Deflation is very harmful to the economy, since it causes an increase of the real burden debt and discourages consumption as spending decisions are postponed due to expectations of further decrease in prices. This scenario favors the economic slowdown and a downward spiral economy. All these converge to business and citizens at the end.In 2010 the Albanian economy has had a decline in the annual inflation rate, a phenomenon that has continued even in recent years. Until now, BoA, following the policy of the ECB,

has lowered annual targets of annual inflation to 2 or 3%, without concerning about the continuous decline of annual inflation rate till it reached 0.2%. This sharp decline of annual inflation rate is a warning of the deflation risk for the economy.

Although in these cases, most expertise suggests that in response to the decrease in aggregate demand: Central banks should react using expansionary policies, expanding the money supply, or that the fiscal authority should aim to increase demand by borrowing at interest rates, which are on behalf of private entities, on the one hand, and on the other hand, revising mitigation measures (quantitative easing), (negative interest) and especially some revisions in fiscal policy. Their effectiveness would be incomplete without them being harmonized with a new maneuver for a better restructuring and prioritization of the economy, by strongly supporting the development of agriculture and agribusiness, while loosening construction permits without losing control over the order in territory, insisting on the realization of investments and enhancing the quality through domestic and foreign sources and further improve the business climate. The European Central Bank is expected to increase the penalty towards banks that keep their money in virtual coffers, with the hope that such action will push banks to invest this money in the Eurozone economy. The move was anticipated by analysts and is part of a policy of the ECB in order to provide a new impetus to the economy in the euro zone and remove the destructive process of falling prices, known as deflation process. And this bold move towards a relatively unknown territory, similar to the one called negative interest rates, may be just one of the steps that analysts expect from the meeting of the Governing Council of the ECB. Other measures may be: increasing the purchase of government bonds and other assets beyond the monthly fee level of EUR 60 billion, or 66 billion that the ECB began last month. However, policy makers fear that the extent of deflation can occur and negative deflationary effects are very difficult to be cured. There has been a debate among economists about the fact that central bank measures have had or not much effect. There are also risks. For example, negative interest rates may cause damage to banks' profits in a time when many banks suffer from bad loans or other problematic assets. The process of printing money, known as "quantitative easing", has helped to keep the euro weak against dollar, which is positive for European exporters. M. Draghi believes that this measure has made it easier for banks

to lend (Draghi, 2016). But low inflation has made prompting analysts speculate that the central bank may need to do even more (other measures).

CHAPTER 2

LITERATURE REVIEW

There are two views related to the impact of deflation on the economy. The first one is a view from the Keynesian Economic School which identifies deflation as a bad impact on economy, while the second one is the benefit of the economy from the presence of deflation, supported by Milton Friedman (Friedman, 1969).

According to Friedman's reasoning, the nominal interest rate should be zero and the price level should fall steadily at the real rate of interest, to reach an optimal policy. In his compositions Milton Friedman faulted the national bank strategies for bringing on the Great Depression. As indicated by Friedman, the Federal Reserve neglected to pump enough saves into the keeping money framework to keep the fall in the cash stock. For Friedman, the disappointment of the US national bank is not that it brought on the money related air pocket but rather that it permitted the emptying of the air pocket.

Another study by Harold Cole and Narayanna Kocherlakota supports Friedman's findings and answers further questions needed (Cole & Kocherlakota, 1998). They used a standard one-sector neoclassical growth model that includes one main constraint: cash-in-advance that requires households to use cash balances accumulated before each period to buy consumption goods in that period. [3]

[3]The cash-in-advance constraint is a commonly used device to motivate a demand for money in otherwise frictionless economic models

This constraint is an easy way to attract to stimulate transactions demand for money. It implies that households have to wait to spend their wage to buy goods until next period. Eventually they equate their marginal rate of substitution between consumption and leisure, not to their marginal product of labor but to their marginal product of labor discounted by the time value of money. This can be realized if the nominal rate of interest is zero in each period. Extreme contractions or expansions of money supply are consistent with zero nominal interest rates as long as they are not long lasting. Real balances in this case can grow exponentially. The results of the study imply that inflation is a real phenomenon for any optimal monetary policy, since rate of deflation equals the real interest rate.

Another economic research that supports this theory is conducted by the Research Department of University of California, Los Angeles and Federal Reserve Bank of Minneapolis (Atkeson & Kehoe, 2004).

The study used a panel data oninflation and output growth of 17 countries over 100 years (1980s-2000s). The model is constructed into five-year periods, by computing the average annual inflation rate and output growth of each specific period. A negative inflation rate is named as deflation, where a negative output growth is named as depression. From the model they concluded that the only period they found linkage between deflation and depression was during the Great Depression (1929-1934). There was no evidence of linkage in any other period. They concluded that there was no linkage between deflation and economic depression, except the case of US during the Great Depression.

The Bank of International Settlements (BIS) noticed deflation in 38 areas for the last century, and published a paper regarding this phenomenon (Borio, Gerdem, Filardo, & Hofmann, 2015). According to their studies, it is not a fact that there is a negative correlation between deflation and economic situation. They state that during deflation a country might be experiencing recession on economy, but it is not the cultivator of it. The model consists in overall deflation and growth per capita in different time periods: the classical gold standard (1870-1913), the Interwar period (1920-1938), the Great

Depression (1930-1933), the Postwar (1947-2013). From the data they saw that only during the Great Depression there was a very poor economic growth and a weak economic growth during war. In the postwar era, where there are many countries in deflation, there was a higher economic growth on average.

There have been other cases during which deflation impacted positively on the economy (Bordo, Lane, & Redish, 2004). According to their point of view, the main factor that leads to economic weakening is the fall in equity prices like the house prices and stock market bubble crash, rather than the massive decrease in consumer prices. They examined asset prices in nominal terms by analyzing output growth and deflation based on three price indices: goods and services, property, equity prices. They considered each asset price deflation in isolation and then jointly. They ran a regression of output growth on contemporaneous annual percentage change in the individual price indices.

The middle value decay was around 18%, with a moderately contract interquartile extend crosswise over economies. The chart additionally demonstrates that value levels were at that point on a declining pattern before the onset of the Great Depression, reliable with our perception that relentless value collapse began in many nations amid the early or mid-1920s. By differentiation, property and value costs in many nations topped just before the financial constriction. The middle decrease in house costs in the vicinity of 1929 and 1933 was around 22%; that in value costs from their 1928 pinnacle was around 51% by 1931 and in the United States no under 67%. The US has experienced this problem from the Wall Street Stock Exchange crash in 1929. So to conclude, the real problem after a deflationary situation is the price level of equity and land and their stability.

Other authors have made a regression model, checking for any correlations from the Atkeson model (Bordo & Redish, 2004). They studied US and Canada from 1870 to 1913 by applying vector auto regression. By using a Banchard-Quah-type method they identified a VAR. This means that these in these countries supply shocks led to output changes while money shocks led to changes in price level. They concluded that during this time there existed a correlation between deflation and depression. However for

Canada, this was rather a coincidence than a causal relation, by controlling other shocks. God discoveries happened at the same time as when productivity improved.

There were questions from the economists of whether the monetary policy was the main cause of deflation in Japan. (Bernanke & Gertler, 1999)analyzed the monetary policy in Japan taking into consideration asset-price bubbles. They did this by building a model using an exogenous asset-price bubble and different monetary policy rules in order to see the reactions for the Bank of Japan and the Federal Reserve. Despite using their model, they considered other models created by (Clarida, Gali, & Gertler, 1998)with the same aim to observe reactions towards the two banks. From the results of the models, the monetary policy of Japan was too tight during 1985-1988 and too slack during 1988-1990. Due to its laxity, the stock prices were rising continuously, by causing the stock bubble. The critics say that if the government and the Bank of Japan would interfere earlier during this period, they would have ended the stock bubble without causing major damages.

On the other hand Bernanke's and Gertler's model is turned down by (Okina, Shirakawa, & Shiratsuka, 2001)with the argument that they did not adjust the inflation rate to consumption tax rate changes. According to their theory the increase of interest rate came from the consumption tax rate in 1989. Okina, Shirakawa, and Shiratsuka analyze the lowered interest rate during 1986-1987 as an attempt from the BOJ to support the policy coordination framework and though preventing the appreciation of yen. They give a thorough analysis of how the bubble started, how could it be prevented by the policy measures of BOJ and what was the real cause of this recession. According to (Frederic, 2001)and (Ito & Mishkin, 2006), the BOJ must have paid more attention to asset prices regardless of their effects on CPI. Ito emphasizes the bank's supervision rather than the monetary policy, in order to prevent a bubble burst.

Numerous scholastics and policymakers, Takatoshi Ito and Frederic S. Mishkin contend that the Bank of Japan's activities were short of what was needed, at any rate everything considered, in keeping collapse from rising and battling out of emptying. Numerous scholarly commentators have been contending for nonconventional money related

arrangement in battling collapse: for instance, buying long haul securities, values, outside cash named securities, and nonperforming credits. Nonetheless, we can state that the transmission channel of nonconventional fiscal approach is vague. A vital instrument that has likewise been proposed to advance an autonomous national bank was expansion focusing on. Additionally this swelling focusing, from 1 to 3 percent, would make expansion desires get to be distinctly elevated, and the deflationary spiral would be broken down. Notwithstanding, the BOJ has restricted expansion focusing, with financial experts in the Bank of Japan contending that there are no certain instruments to escape flattening, and an insignificant declaration without instruments would not persuade showcase members to change their swelling desires. There were a few segments that the bank have proposed to keep the zero loan cost strategy until the expansion rate turns out to be steadily over zero has comparative impacts to swelling focusing on.

CHAPTER 3

DATA AND METHODOLOGY

3.1 Data

This study used secondary qualitative data. The quarterly data is mainly obtained from the World Bank for the period between 1986 and 2013. Other important sources are data from the IMF, INSTAT, journals and research papers.

The model is constructed by quarterly data of Japan, where dependent variable is GDP, and the independent variables are: inflation, interest rate, unemployment rate.

- GDP: indicates the quarterly GDP in Japan measuring the market value of all final goods and services produced, in percentage change between quarters.
- Inflation rate: indicates the consumer price index in Japan in percentage terms that examines the weighted average of prices of a basket of consumer goods and services, such as transportation, food and medical care.
- Interest rate: indicates the short-term interest rates in Japan in percentage terms,at which short-term borrowings are affected between financial institutions or the rate at which short-term government paper is issued or traded in the market. Data are quarterly.

- Unemployment rate: indicates the rate of unemployment in Japan, calculated as a percentage by dividing the number of unemployed individuals by all individuals currently in the labor force. Data are quarterly.

3.2 Methodology

First I will conduct a descriptive analysis to better understand the features of the data I am studying for Japan. The data will be illustrated by graphs and descriptions.

Next, the methods used to generate statistical results, include a multiple regression model in order to analyze the impact of CPI, interest rate and unemployment rate in GDP. The data includes the whole period from 1986 to 2013 divided in two sub-periods, before deflation from 1986 to 1994 and during deflation from 1994 to 2013.

3.2.1 Descriptive Analyzes

Indications of the debilitating economy were far reaching in 1998, so why did it take so long to settle on a choice on presenting the zero financing cost approach? In 1998, the Bank of Japan rolled out two little improvements towards facilitating. To begin with, on 9 September, the Bank of Japan chose to bring down the call rate (arrangement financing cost) from underneath yet close to 0.50% to 0.25%. This was a reasonable stride of money related facilitating. On 13 November, the Bank of Japan chose to help financing companies by utilizing open market operations in CP. This expanding of operation instruments had both money related arrangement and budgetary solidness purposes. One conceivable clarification why ZIRP was not presented until February 1999 was that it was viewed as the last card, since no further financing cost cut is conceivable after the ostensible loan fee hits zero, the lower bound. (The ostensible loan fee can't be negative, generally money storing will supplant bank stores, and the monetary framework will endure gigantic disintermediation.) The last card ought to be kept for a sharp, sudden decrease in monetary exercises or a close emergency of the budgetary framework. Be that as it may, keeping the last card close by may have brought about a moderate, however

relentless decrease in monetary exercises, and after some time it had comparative impacts of not helping a stagnating economy.

It took more than a decade to drive the Japanese economy stagnant. The normal development rate from 1993 to 2003 is recently over 1 percent. The expansion rate, measured by GDP deflator or Consumer Price Index (CPI), has been negative. The CPI value level before the finish of 2003 was 3 percent beneath the 1997 level, amid emptying period. During 1997-2002 the Japanese GDP had contracted by 4 percent and during the same period the GDP of the US has expanded by 25 percent. This period was called "lost decade" in Japan, as a result of numerous issues. By 2003, land and stock cost files have tumbled to between 33% and one-fourth of the separate crest in 1989–91. Amid the keeping money emergency of 1997–98, there were man nonperforming credits. The utilization charge rate increment and annulment of salary tax reduction in April 1997 is regularly viewed as a monetary arrangement botch. Moderate basic change in managed segments is an additional problem for the Japanese economy, which did not profited from the data and correspondence innovation (ICT) progresses that moved the U.S. economy. There were many reasons for emptying in Japan, however the most vital was a disappointment of money related arrangement, since expansion or flattening is at last a fiscal marvel. The BOJ was not able to maintain a positive expansion rate, regardless of its different endeavors. The BOJ increased the call rate to a level of 0.25 percent in 2000 in bogus desire of proceeding with financial development, against challenges from the administration and numerous business analysts. The loan cost was brought down to zero again in March 2001. The objective measure of current record was at first set at 5 trillion yen, and the mandatory stores were around 4 trillion yen. It’s imperative that the bank extended the measure of month to month inside and out buy of long haul government bonds. By 2002, the economy and the money related foundations debilitated once more. Deflationary desires were setting in, and utilization and venture were discouraged. Additionally we can specify discouraged costs, strengthening deflationary desires. There did not appear to be an answer for the deflationary winding. At the point when the zero financing cost strategy (ZIRP) was initially presented in 1999, it was expected to proceed until "deflationary concern is dissipated." In 2001, it was proclaimed to proceed until "the

swelling rate turns out to be steadily over zero." There were such extraordinary endeavors to battle emptying and its negative effects.

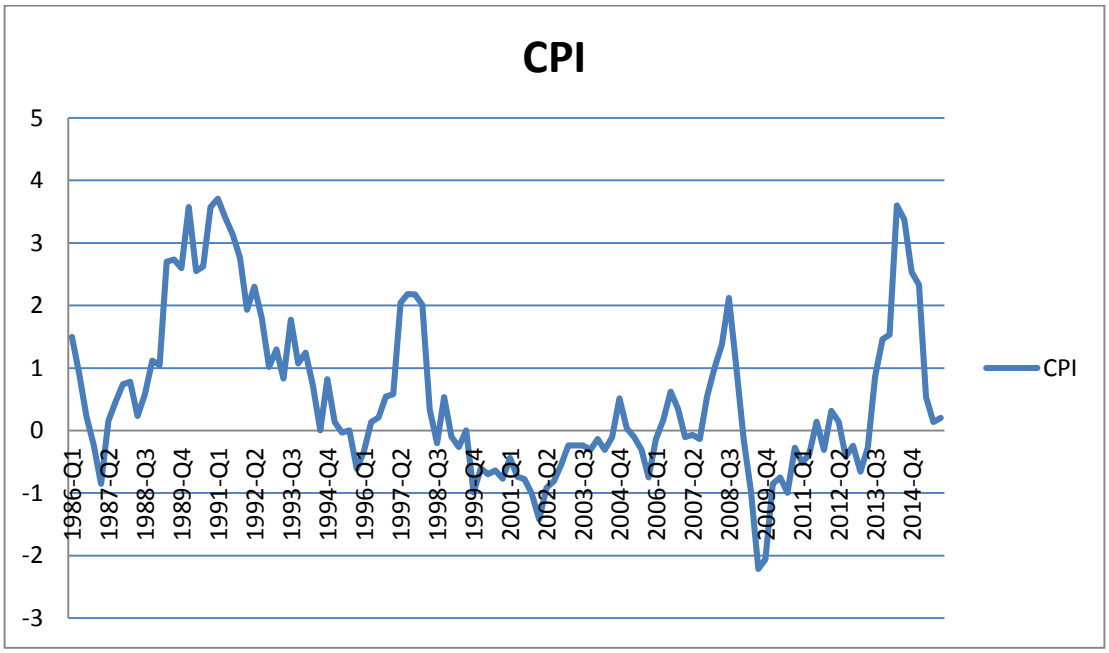

FIGURE 3.1 CPI values from 1986 to 2013

As we can see from the graph the CPI has had different movements quarterly from 1986 to 2015. The lowest value is in 2009 at -2.2132. We can see that during 1986 to 1995 Japan has experienced disinflation and inflation, while since 1995 to 2012 there was evidence of deflation. The period 2008-2009 shows a sharp decline of CPI mainly affected by the global financial crisis.

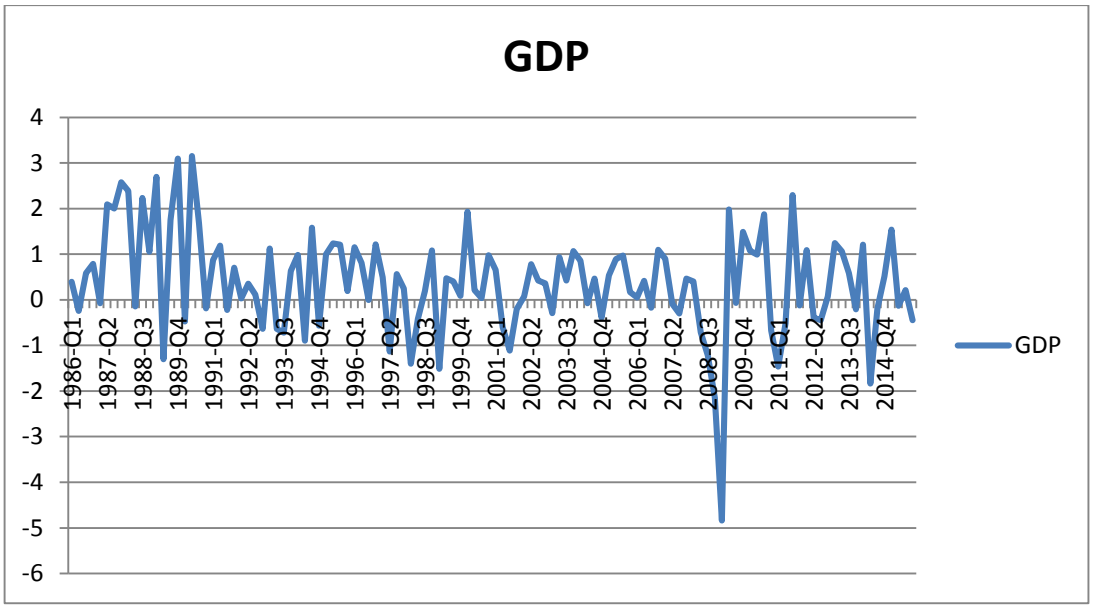

FIGURE 3.2 GDP values from 1986 to 2013

In the late 1980s Japan was experiencing a good fiscal situation. An increase in tax revenue in 1988 decreased the ratio of government debt to GDP. After that the situation began to worsen when the bubble burst appeared in real and stock markets. From the graph we can see that the GDP reached a value of –0.145 in 1988. A wrong measure was undertaken by the Japanese government when it increased the consumption tax in 1997 from 3 to 5 percent. After that the economy began to weaken. In 1997 started the Asian currency crisis followed by the banking crisis of non-performing loans. The oil crisis weakened the economy further since 1970. The value of GDP was in negative terms during this period, reaching -1.1310. The economy was hit by the 2008 financial crisis when the GDP fell sharply to -4.8391.

Interest rates in Japan were too low for a very long time even though it was clear that real estate and equity prices no longer bore any resemblance to reality. Growth was outstripping productivity in the economy, very significantly. The BOJ kept pumping money in. Many economists have argued earlier than when they started to deflate the bubble, that the BOJ should have been pulling back and it should have been making money more expensive to that point to get a softer landing. Instead the BOJ kept going until it reached a point where everyone agreed this really was untenable. The market started to go

down on its own, and at that point the BOJ accepted that they have let it go too far so they had to stop it. They really increased interest rates and that added to the crisis.

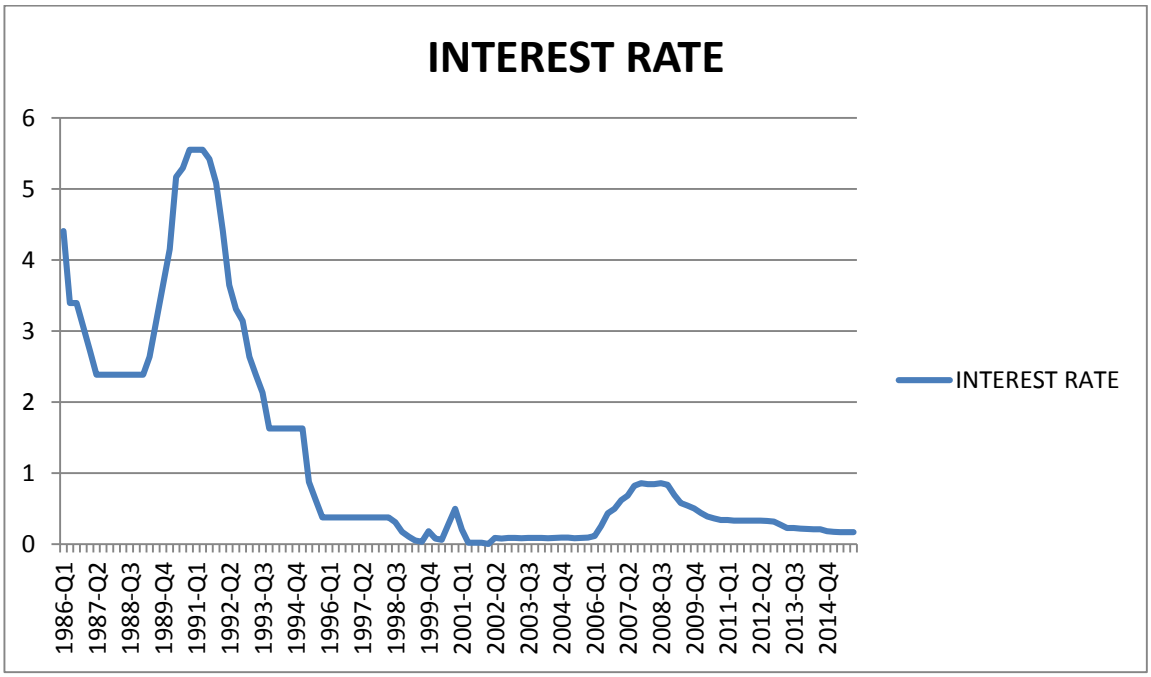

FIGURE 3.3 Interest rates from 1986 to 2013

The graph shows a decrease of interest rates from 1986 to 1988. In 1989 there was an increase from 2 to 5 percent. After the 1990s there was a constant decrease of interest rate. Japan has faced negative interest rates in order to boost the economy. The BOJ used negative interest rates to boost a stumbling recovery in the world's third largest economy. Central Bank said it is imposing a 0.1% fee on deposits left with the central bank, nearly a negative interest rate. By this, the BOJ wants to encourage commercial banks to increase lending and stimulate investment and prosperity.

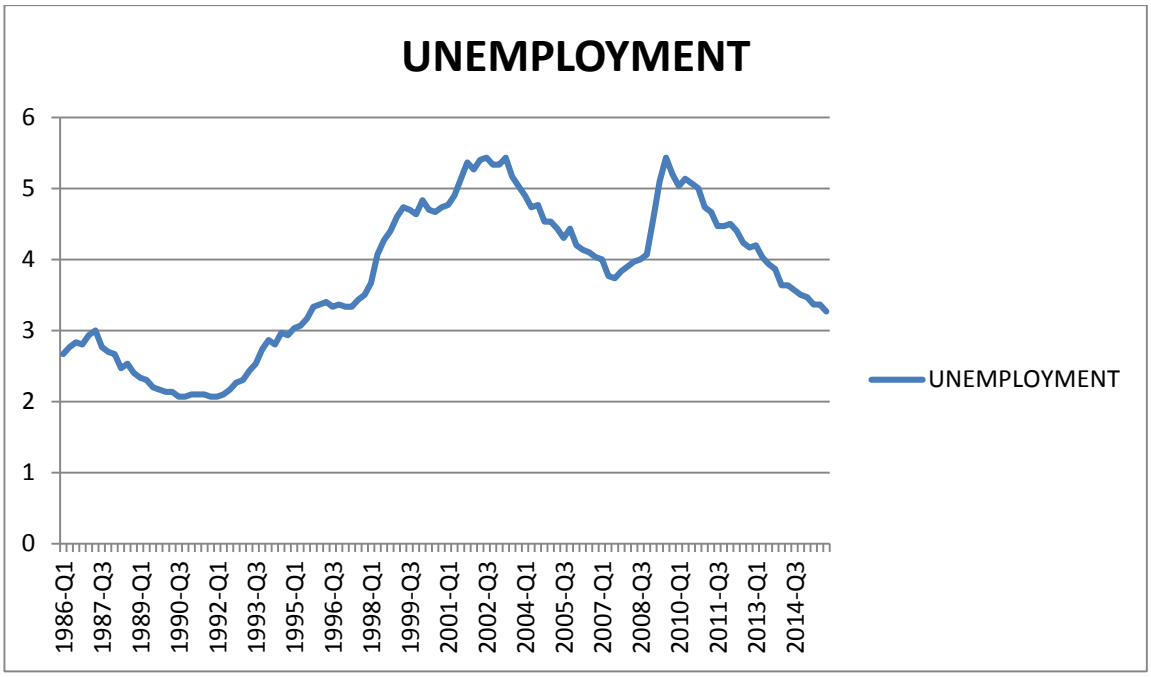

FIGURE 3.4 Unemployment rates from 1986to 2013

From the graph it is seen an increase of unemployment rate after the 1990s. It follows with a steady increase till 2003. The rate decreases till the end of 2007 and it increases in the beginning of the financial global crisis reaching 5.4 %.

3.2.2 Multiple Regression

"Multiple regression is a statistical tool used to derive the value of a criterion from several other independent, or predictor, variables. It is the simultaneous combination of multiple factors to assess how and to what extent they affect a certain outcome." [4]

The multiple regression model used is a simple linear regression model which represents the effect that independent variables: inflation rate, interest rate and unemployment rate have on the dependent variable, GDP.

$GDP_t = B_0 + B_1 Inf_t + B_2 Int_t + B_3 Unemp + et$

[4] https://www.techopedia.com/**definition**/27369/**multiple-regression**

CHAPTER 4

EMPRICAL ANALYSIS

4.1 Descriptive Analysis

TABLE 4.1 Descriptive Statistics Result for the first period

	GDP	INFLATION	INTEREST	UNEMP
Mean	0.782898	1.486263	3.207189	2.472973
Median	0.702333	1.120124	2.720000	2.433333
Maximum	3.153970	3.709199	5.550000	3.033333
Minimum	-1.305732	-0.853375	1.629000	2.066667
Std. Dev.	1.195063	1.205811	1.295885	0.332112
Skewness	0.319515	0.277145	0.606200	0.196987
Kurtosis	2.141754	2.078278	2.112241	1.534552
Jarque-Bera	1.765124	1.783415	3.481131	3.550079
Probability	0.413722	0.409955	0.175421	0.169477
Sum	28.96721	54.99173	118.6660	91.50000
Sum Sq. Dev.	51.41430	52.34331	60.45544	3.970749
Observations	37	37	37	37

TABLE 4.2 Descriptive statistics result for the second period

	GDP	INFLATION	INTEREST	UNEMP
Mean	0.236572	-0.096773	0.323736	4.410502
Median	0.400596	-0.238908	0.330000	4.466667
Maximum	2.294270	2.182066	0.876000	5.433333
Minimum	-4.839162	-2.213280	0.002667	3.066667
Std. Dev.	1.056224	0.851889	0.244645	0.645064
Skewness	-1.603121	0.800388	0.759273	-0.275797
Kurtosis	8.938078	4.563317	2.774348	2.157000
Jarque-Bera	138.5198	15.22793	7.168902	3.087001
Probability	0.000000	0.000494	0.027752	0.213632
Sum	17.26979	-7.064449	23.63275	321.9667
Sum Sq. Dev.	80.32393	52.25151	4.309302	29.95972
Observations	73	73	73	73

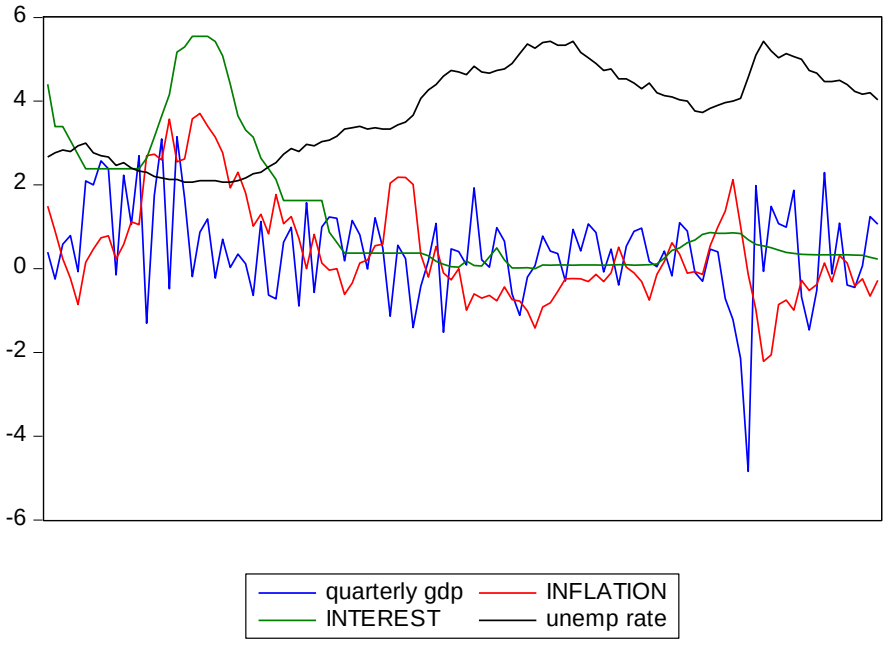

FIGURE 4.1 Graphical illustration of the whole data set

4.2 Regression results

I have used the Augmented Dickey Fuller test statistic to check if each of the variables is stationary or non-stationary.

TABLE 4.3 ADF results for GDP variable

Null Hypothesis: GDP has a unit root

Exogenous: Constant

Lag Length: 0 (Automatic - based on SIC, maxlag=12)

		t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic		-9.326905	0.0000
Test critical values:	1% level	-3.491345	
	5% level	-2.888157	
	10% level	-2.581041	

*MacKinnon (1996) one-sided p-values.

From the result p≤5% so the dependent variable is stationary in level.

TABLE 4.4 ADF results for Inflation rate

Null Hypothesis: INFLATION has a unit root

Exogenous: Constant

Lag Length: 4 (Automatic - based on SIC, maxlag=12)

		t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic		-1.795576	0.3809
Test critical values:	1% level	-3.493747	
	5% level	-2.889200	
	10% level	-2.581596	

*MacKinnon (1996) one-sided p-values.

From the result, inflation rate is non-stationary in level since p-value is higher than 5%.

TABLE 4.5 ADF result for the first difference of Inflation rate

Null Hypothesis: D(INFLATION) has a unit root

Exogenous: Constant

Lag Length: 3 (Automatic - based on SIC, maxlag=12)

		t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic		-7.607237	0.0000
Test critical values:	1% level	-3.493747	
	5% level	-2.889200	
	10% level	-2.581596	

*MacKinnon (1996) one-sided p-values.

In order to make the data stationary I apply ADF on the first difference of the variable. As it is seen, the p-value is lower than 5%, so it is stationary.

TABLE 4.6 ADF results on Interest rate

Null Hypothesis: INTEREST has a unit root

Exogenous: Constant

Lag Length: 1 (Automatic - based on SIC, maxlag=12)

		t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic		-1.282775	0.6356
Test critical values:	1% level	-3.491928	
	5% level	-2.888411	
	10% level	-2.581176	

*MacKinnon (1996) one-sided p-values.

From the table, this variable is non-stationary, so we apply the first difference.

TABLE 4.7 ADF result on first difference of Interest rate

Null Hypothesis: D(INTEREST) has a unit root

Exogenous: Constant

Lag Length: 0 (Automatic - based on SIC, maxlag=12)

		t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic		-6.412990	0.0000
Test critical values:	1% level	-3.491928	
	5% level	-2.888411	
	10% level	-2.581176	

*MacKinnon (1996) one-sided p-values.

The variable is stationary on first difference. P-value is lower than 5%.

TABLE 4.8 ADF results on Unemployment rate

Null Hypothesis: UNEMP has a unit root

Exogenous: Constant

Lag Length: 1 (Automatic - based on SIC, maxlag=12)

		t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic		-1.225552	0.6614
Test critical values:	1% level	-3.491928	
	5% level	-2.888411	
	10% level	-2.581176	

*MacKinnon (1996) one-sided p-values.

The unemployment rate is non-stationary with a p-value of 0.6614.

TABLE 4.9 ADF results on first difference of Unemployment rate

Null Hypothesis: D(UNEMP) has a unit root

Exogenous: Constant

Lag Length: 0 (Automatic - based on SIC, maxlag=12)

		t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic		-6.759216	0.0000
Test critical values:	1% level	-3.491928	
	5% level	-2.888411	
	10% level	-2.581176	

*MacKinnon (1996) one-sided p-values.

The first difference of the variable is stationary so we use it in our regression analysis.

Regression Analysis Results

Whole period

TABLE 4.10 Whole-period regression analysis

Dependent Variable: GDP

Method: Least Squares

Included observations: 109 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
DINFLATION	0.058457	0.201837	0.289625	0.7727
DINTEREST	0.505952	0.459805	1.100360	0.2737
DUNEMP	-1.358698	0.816032	-1.665005	0.0989
C	0.457925	0.108732	4.211502	0.0001
R-squared	0.054339	Mean dependent var		0.420545

Adjusted R-squared	0.027320	S.D. dependent var	1.134748
S.E. of regression	1.119140	Akaike info criterion	3.099005
Sum squared resid	131.5098	Schwarz criterion	3.197770
Log likelihood	-164.8958	Hannan-Quinn criter.	3.139058
F-statistic	2.011146	Durbin-Watson stat	1.995950
Prob(F-statistic)	0.116875		

Result summarized in Table 4.12 indicates that unemployment has significant negative impact on GDP in the whole period at 10% significance level which is consistent with the theory. But, inflation and interest rate have no impact on GDP.

First sub-period

TABLE 4.11 First sub-period regression analysis

Dependent Variable: GDP

Method: Least Squares

Included observations: 36 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
DINFLATION	-0.375899	0.312582	-1.202560	0.2380
DINTEREST	1.108748	0.551514	2.010372	0.0529
DUNEMP	-1.588605	2.207002	-0.719802	0.4769
C	0.881125	0.196072	4.493889	0.0001

R-squared	0.172546	Mean dependent var	0.793599
Adjusted R-squared	0.094972	S.D. dependent var	1.210216
S.E. of regression	1.151314	Akaike info criterion	3.224124
Sum squared resid	42.41677	Schwarz criterion	3.400071
Log likelihood	-54.03424	Hannan-Quinn criter.	3.285534
F-statistic	2.224275	Durbin-Watson stat	2.552216
Prob(F-statistic)	0.104407		

In the first period, only interest rate has significant positive impact on GDP at 10% significance level. No significant impacts of unemployment and inflation on GDP are detected in this period.

Second sub-period

TABLE 4.12 Second sub-period regression analysis

Dependent Variable: GDP

Method: Least Squares

Included observations: 73

Variable	Coefficient	Std. Error	t-Statistic	Prob.
DINFLATION	0.403175	0.247453	1.629304	0.1078
DINTEREST	-1.075744	1.003320	-1.072184	0.2874
DUNEMP	-1.060691	0.838199	-1.265440	0.2100
C	0.232741	0.121437	1.916563	0.0594

R-squared	0.100109	Mean dependent var	0.236572
Adjusted R-squared	0.060983	S.D. dependent var	1.056224
S.E. of regression	1.023512	Akaike info criterion	2.937593
Sum squared resid	72.28280	Schwarz criterion	3.063097
Log likelihood	-103.2221	Hannan-Quinn criter.	2.987609
F-statistic	2.558646	Durbin-Watson stat	1.876838
Prob(F-statistic)	0.062086		

The result summarised in the table 4.12 indicates that none of explanatory variables have impact on GDP in the second period of the sample.

TABLE 4.13 Regression analysis for the whole period using Unemployment rate as a dependent variable

Dependent Variable: DUNEMP

Method: Least Squares

Sample (adjusted): 2 110

Included observations: 109 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
DINFLATION	-0.082730	0.022426	-3.689028	0.0004
DINTEREST	-0.088501	0.053901	-1.641916	0.1036
GDP	-0.018932	0.011371	-1.665005	0.0989
C	0.015762	0.013791	1.142934	0.2557

R-squared	0.181762	Mean dependent var	0.012538
Adjusted R-squared	0.158384	S.D. dependent var	0.144001
S.E. of regression	0.132106	Akaike info criterion	-1.174412
Sum squared resid	1.832469	Schwarz criterion	-1.075647
Log likelihood	68.00547	Hannan-Quinn criter.	-1.134359
F-statistic	7.774838	Durbin-Watson stat	1.606908
Prob(F-statistic)	0.000097		

To extent the study we also explore the impact of main macroeconomic factors which are inflation, interest rate and GDP on unemployment. Result summarized in the Table 4.13 shows that inflation has significant negative impact on unemployment at 5% significance level while GDP has significant negative impact on unempleoyment at 10% significance level. So from the regression, it results that a decrease in inflation rate growthat 1% causes an increase in unemployment rate growth at 0.08%.

TABLE 4.14 Regression analysis for the first sub-period using unemployment rate as dependent variable

Dependent Variable: DUNEMP

Method: Least Squares

Sample (adjusted): 2 37

Included observations: 36 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
DINFLATION	-0.032615	0.024729	-1.318897	0.1966
DINTEREST	-0.070437	0.044809	-1.571936	0.1258
GDP	-0.010030	0.013934	-0.719802	0.4769
C	0.011479	0.019793	0.579952	0.5660

R-squared	0.179202	Mean dependent var	0.010185
Adjusted R-squared	0.102253	S.D. dependent var	0.096550
S.E. of regression	0.091480	Akaike info criterion	-1.840943
Sum squared resid	0.267798	Schwarz criterion	-1.664997
Log likelihood	37.13697	Hannan-Quinn criter.	-1.779533
F-statistic	2.328821	Durbin-Watson stat	2.124691
Prob(F-statistic)	0.093069		

For the first sub-period there is no significance on the relationship between the dependent variable and the independent variables.

TABLE 4.15 Regression analysis for the second sub-period using unemployment rate as dependent variable

Dependent Variable: DUNEMP

Method: Least Squares

Sample: 38 110

Included observations: 73

Variable	Coefficient	Std. Error	t-Statistic	Prob.
DINFLATION	-0.112867	0.033126	-3.407212	0.0011
DINTEREST	-0.275519	0.139757	-1.971409	0.0527
GDP	-0.021384	0.016898	-1.265440	0.2100
C	0.012832	0.017628	0.727924	0.4691

R-squared	0.238237	Mean dependent var	0.013699
Adjusted R-squared	0.205116	S.D. dependent var	0.163000
S.E. of regression	0.145325	Akaike info criterion	-0.966457
Sum squared resid	1.457229	Schwarz criterion	-0.840952
Log likelihood	39.27568	Hannan-Quinn criter.	-0.916441
F-statistic	7.193098	Durbin-Watson stat	1.636037
Prob(F-statistic)	0.000286		

Table 4.15 gives the regression results for the second period of the study. It shows that Inflation and Interest rate have significant negative impact on the unemployment at 1% and 5% level of significance.

CHAPTER 5

CONCLUSIONS

5.1 Conclusion

The aim of this paper is to explain the impact of deflation on the economy by considering the main macroeconomic indicators which include GDP, unemployment rate and interest rates. At the beginning, a detailed analysis of the picture of Japan's economic history is made by emphasizing the most crucial factors that led the economy to the current chronic deflationary situation. The analysis consisted in the period which was also known as the "Economic Miracle", followed by the "Lost Decade" which marked the economic slowdown of the nation. The asset price bubble burst, and since then prices has been falling, till the inflation rate reached negative levels. The government and the Bank of Japan applied easing policies in order to put things under control, but the fact that Japan was a powerful country, fooled a majority of people by thinking that this situation was a temporary one for Japan. Japan is the country that has been through this for two decades and it represents the perfect example to be taken from other countries which are having inflationary declines.

Next I have made a review of literature by famous scholars who mainly agreed with deflation being a benefit to the economy of a country. Further, I have made a descriptive analysis by describing the data factors I have chosen, by indicating each factor's behavior for this period.

To prove any relation of deflation with economic environment, I made a multiple regression analysis and I found a relation between inflation rate and unemployment rate, backing up the theory of Phillips curve. So any change in inflation rate cause a percentage inverse change on unemployment rate. Empirical result shows that deflation is found to have significant negative impact on the Japanese economy through unemployment. During deflation japan economy suffered from negative impact of low inflation compared to the times Japanese economy enjoys reasonable level of inflation.

5.2 Implications

This study can be valuable to policymakers and researchers in order to understand the reality behind deflation and recession. I have chosen Japan as the best example with a long time deflationary situation. I think it is an interesting study to analyze deflation in Japan being the third most developed country in the world. Therefore, researchers and policymakers may find important information related to the monetary policy and the overall economic situation in Japan. The impact of deflation was significant for unemployment rate, emphasizing the importance of Phillips curve theory.

5.3 Limitation of the Study

The study has a limitation of not having another country on deflation for the same time period as Japan. Therefore it is a study based only in Japan for the given time-period. Also the economic recession can be influenced by many other factors that I have not included on the model.

5.4 Further Studies

This phenomenon needs to be studied and considered by other scholars and researchers, possibly by including other indicators in the model and focusing more on the effect on unemployment rate.

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