“INFLATION AND MONEY GROWTH”

(Case of Albania and Germany)

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THESIS SUBMITTED FOR THE DEGREE OF MASTER OF SCIENCE IN BANKING AND FINANCE

EPOKA UNIVERSITY

JANUARY 2017

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INFLATION AND MONEY GROWTH
(Case of Albania and Germany)

ABSTRACT

The main purpose of the study is to explore the correlation between the money supply and inflation rate for Albania case, within period of time from 2010 to 2015. Monthly observations of inflation and money supply are obtained from International Monetary Fund. Empirical findings indicate that the changes in money supply have significant impact on Inflation starting from second month in Albania. The significant impact found in Germany takes place starting from the first month. For Albania case, one of the first reasons is that its economy is moving slowly and the second reason is because of the informality.

Keywords: Inflation, Money Growth, Regression Analysis, Germany, Albania.

INFLACIONI DHE FLUKSI I PARASE
(Rasti I Shqiperise dhe Gjermanise)

ABSTRAKT

Qëllimi i këtij studimi është që të shqyrtojë lidhjen midis rritjes së inflacionit dhe fluksit te parase për rastin e Shqipërisë, brenda periudhës kohore prej 2010 deri në vitin 2015. Ky studim është sjellje duke analizuar teorine e fluksit te parase, në lidhje me inflacionin. Në këtë studim është marrë si shembull një vend i zhvilluar evropian si Gjermania, gjatë të njëjtës periudhë kohore te ketij kerkimi. I gjithë ky studim është bërë, kryesisht duke përdorur metodologjinë analizen e regresionit, nëpërmjet shqyrtimit të ngjarjeve ekonomike, më shumë duke iu referuar treguesve makroekonomikë gjatë periudhës kohore prej vitit 2010 deri në vitin 2015. Më pas rezultatet e Shqiptare janë krahasuar me rezultatet shtetit europian me te zhvilluar. Shumica e të dhënave të përdorura janë marrë nga faqja e internetit e Fondit Monetar Ndërkombëtar, e cila është një faqee besuar dhe me te dhena te perditesuara. Te dhenat jane per nje peirudhe 6 vjecare, bazuar në.

***Fjalet kyce*:** Inflacioni, Fluksi i Parase ,Teoria e Fluksitte Parase, Analiza e regresionit, Gjermani, Shqipëri.

ACKNOWLEDGEMENTS

First of all, I gratefully acknowledge all the persons that have tried to help me, also have contributed in different ways for finalizing this kind of study.

Personally I express my special thanks to my professor honorable Prof. Ugur Ergun who guided me andalways gave me professional advices and support at every moment to pass each difficulty. I cannot find words to describe, his generous assistance and extraordinary patience. I thank him for his suggestions and expertise for the development of the econometric model. Thank you professor for the support that you have offered to me.

Many thanks to the academic staff of the “Epoka University”, especially honored master degree professors Prof. Urmat Ryskulov. Without his vision and commitment, master's studies would not have been so contemporary.

Last but not least, special thanks also to my fiancé that has given to me a high moral support.

DECLARATION

I sincerely declare that this Master Thesis titled “Inflation and Money Growth” is based on citations which have been duly acknowledged and on my original work except quotations. This thesis has not been submitted at any other Institution or University or at Epoka University for any kind of purpose, either previously neither currently.

Mirjan Zajaku
27 January 2017

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CHAPTER 1

INTRODUCTION

1.1 Focus of the study

Albanian economy is one of the transition economies that has tried to perform well at fighting the inflation. Due to the fact that Albania has been a post communist country, after the communist system has fallen in 1990 and through the private enterprise system creation in 1992-ongoing the price levels have increased immediately. The collapse of communist system in Albania occurred in the end of 1990 and during the beginning of 1991. This period was also a year of widespread emigration, social disorders and most of all it was followed by economic collapse. The turnaround began in 1992, during this year it was created a one-year reform programme. The key objective of this reform was the decrease of annual inflation lower than 20 per cent. The principal nominal anchor of this programme was designed to be money growth, supported at first by a fiscal policy which used to have as a central objective to eliminate the monetary deficit financed during the middle of 1993, and secondly, it was supported by a tight credit policy. This programme was supported by international institutions such as IMF. The direct instruments were the base of monetary control which was under this programme. The poor state of the banking system the external debt situation and the need to finance the large budget deficit were the main reasons why this decision was taken. At the beginning of 1996 to several foreign banks were issued some licenses on private banking activity.

The banking system has allowed indirect instruments of monetary control to replace direct instruments, indirect instruments such as the floatation of required reserves, refinancing and the requirements of the liquidity, only recently it is decided the consolidation of the replacement of direct instruments through indirect ones. A key role in encouraging the use of indirect instruments of monetary control and inter-bank competition has been the new private banks. An important part of Albanian stabilization policy during the transition was the control of interest rates. It was the first time, after communism, that were given the right to the people, to have freedom to chose also to have private property. The level of output has increase year by year enjoyable due to many serious reforms takenin connection with the development of the economy. After period of communism Albania economy also faced the Albanian Lek (ALL) devaluation. This caused the devaluation of the country currency by ten times and the purchase power of Albanian Lek (ALL) was decreased a lot. The year 1997 was the most difficult year for Albanian people. In this year was the bankruptcy of the pyramid schemes. Lot of people deposited their savings at these pyramid firms, by the hope of doubling or tripling them within a short period of time. Immediately after the collapse of those firms, so-called pyramid schemes, unfortunately most of these people lost their savings deposited there. After the collapse of pyramid schemes the instability of prices has not lasted any longer. Within two years, the inflation rate started to stabilize, also to change the direction from high levels to low levels. This means that from that moment, Albania economy was experiencing stable and low inflation rates. This factors shown a good performance of monetary policy. The period of time starting from 1990 to 2015, is very important to the Albania macro economy, since during these 25 years a lot of changes has happened. It is one of the most significant periods in the Albania economy development. Till the period of year 2010, there are made a lot of studies, for that reason the aim of this study refers to the period of 2010 to 2015.

There are three main objective of this study, which are organized as below: Examining if there exists the correlation between money supply and inflation rate in Albania also in a developed European country such as Germany, is the first objective. The second one is to analyze if inflation rate increase equivalent by an increase of money supply. The last

objective is examining whether after which month, money supply gives its effect on inflation rate in these two countries at a fixed velocity and applying unit root test and autoregressive distributed lag model analysis.

The paper is compound as below sections: The coming section of this paper attributes a brief explanation of inflation and money supply, their definitions and related theories. Inflation and money supply in the European most developed country such as Germany and a European developing country such as Albania.

Section 2 deals with literature review of the study. Section 3 shows the data used to carry out the study and the methodology chosen for research purposes of the study. Here is examined the correlation between two variables inflation and money, where inflation is dependent variable and money supply is independent variable.

Section 4 belong to the empirical results gain from the regression analysis. There are used two types of regression analysis. The first one is Unit Root Test and the second is Autoregressive distributed lag model. Section 5 concludes the paper by restating the main points of this study by mentioning the central idea about inflation and money growth, and summarizing briefly the results from entire work.

1.2 Objective of the Study

The comparison of Albania results with Germany result due to the relationship between inflation and money growth is the objective of the study.

Here is included the revision of the inflation and of the money supply in Albania and Germany. The time period that is taken in consideration for analyzing conditions belong to the year 2010 till year 2015. Another subject of this study is that after making all the analyses regarding these two macroeconomic components, suggesting the controlling of the problems to policy measures in these two countries.

1.3 Motivation of the Study

First of all, I want to emphasize that this type of topic was very interesting for me since I was a student in university. Despite this due to the fact that I have been part of banking system in Albania for about 5 years also motivated me to make a study referring the relationship between inflation and money growth in Albania, by comparing it with an European developed country such as Germany. The last 25 years has been very intensive in Albanian Economy. Some of the most important periods were mention above, but for the period of last 6 years, I had a gap referring the Albania situation, even if I have been in touch every day. After the 2008 crises, Albania again seems to be in the same situation as before 8 years. Through this study I want to understand better the relationship of inflation with money growth in Albania, how do them affect the economy of our country, and which are the reforms that the central bank of Albania has to improve. If we have a look to the prices of last years, we create the idea that they are increased year by year. The purchasing power of Albanian Lek (ALL) is decreasing also since the inflation is increased. The quantity of money or money supply seems to be lower and lower also. At least these are results that every Albanian citizen can gain during their daily life. In my mind there are a lot of question such as; is the relationship of inflation with money supply the same in Albania and Germany? Does this relationship have the same impact in these two countries? All these questions are going to get an answer in this study. These are the mismatches and questions that motivated me to have such topic to study.

1.4 Significance of the study

As mention before this is a very important study for the Albania macro-economy. Last 6 years especially, that refers to the period of this research, are very intensive for our economy. The change of the government in Albania always causes fluctuation in our economy. Finding the relationship of the money supply with inflation, we think that will be very useful for the institutions that control these two elements in a macro-economy. The impact that is reflected toward correlation of money supply and inflation, will give

us a result of actual economy situation of Albania. So, the main significant of this study is given the impact in the controlling of two important figures such as money supply and inflation.

1.5 Inflation

Definition: Inflation is the rate at which the purchasing power of currency is falling compared with general level of prices for goods and services which is rising. It is a rapid increase in price and reflected in the correspondingly decreasing the power of purchasing currency, measured by some broad index such as Consumer Price Index over months or years. Central banks attempt to avoid deflation and limit inflation, in order to keep running the economy smoothly.

Monetarism specifies that inflation is related with the money supply of an economy by giving the example of the Aztec and Inca empires Spanish conquest, massive amounts of especially silver and gold flowed into the Spanish and other European economies. Since the money supply had increased rapidly, prices rose up while the money value fell, resulting to the collapse of economy.

As mention above, inflation is the overall increase in price level. Some of the factors that cause it are as follow:

When demand for goods and services increases aggregates, demand-pull inflation result, and the increase in aggregate demand causes excess demand. That leads to a shortage and make sellers to raises price until the new equilibrium is reached.

When the cost of production is increased, cost-push theory which is known also as supply shock inflation stating that the producers decreases the supply of goods and services. The main reasons that raise the cost of supplies include increases in input prices of rent, wage, and interest. Another main reason is the cut of subsidies or increase of taxation

Built-in inflation is related to the idea that inflation is expected to increase. Into this expectation, labors demand higher wage. Consequently, the cost of production will cause an artificial raise in the level of price.

Money supply has a crucial importance in determining inflation rate. Comply to monetarist economists central banks don`t control money supply sufficiently. In the case that the money supply grows faster than real GDP, it will put pressure the price level resulting in inflation.

1.6 Money Supply

Money supply is called the stock of currency and other liquid instruments in a country's economy during a particular time. Elements such cash, savings accounts, coins and balances held in checking are included in the money supply. Through controlling interest rates and decreasing or increasing the amount of money flowing in the economy the economists analyze the money supply and develop policies revolving around it. Central bank or country's government is responsible for collecting money supply data, recording and publishing periodically them. The money supply's possible impacts on price level, inflation and the business cycle perform the private and public sector analysis. Referring Albania, Bank of Albania (BoA) policy is the most important deciding factor in the money stock, in the same time called money supply.

In the money supply, are generally classified as M's all the various types of money, for example, M0, M1, M2, M3, regarding its size and its type of the account in which the instrument is kept. Each country may use different classifications, so not all of the classifications are widely used. For example M0 and M1 are called narrow money. In this category are included coins, notes that are in circulation and other money equivalents that are easily to be converted in cash. In other hand M2 include M1 and in addition certain money market funds and short term time deposits in banks.

In the case of an increase of money supply, usually causes decrease in interest rates, this increases the quantity of investments. The increase of money supply gives more money in the consumer's hands, by stimulating their spending. In the same time, businesses respond by increasing production because of ordering more raw materials. The demand for labor will increase automatically because of this increase in business activity. In other hand, the opposite of above situation will occur, if a country economy decreases the money supply, or declines its growth rate.

Below is reflected the main Model of the money supply:

At the quantity theory of money is expressed that changes in nominal money will lead to equivalent changes in the price level if velocity is fixed. By the equation below is expressed the quantity theory of money:

$M * V = P * Y$[1]

In which:

M = belongs to supply of money

V = belongs to money velocity

P = belongs to level of price

Y = refers to real GDP

Nominal money M derives the velocity, which is the nominal income P*Y. On the condition that V is fixed, M and P should move together, when prices adjust and if real output is kept at potential output. Furthermore, is stated by the quantity equation, the total of receipts P*Y must equalize because of changes in total of spending M*V. The assumption of the quantity theory of money is thatvelocity is fixed by the central bank and it remains stable over time. Nominal GDP only is affected by shifts in money supply, P*Y since velocity is stable over time. Shortly, 3% increase in nominal GDP will be caused in case of 3% increase in money supply. As a result, both left and right sides of the equation are going to move proportionally in the same direction.

1.6.1 Model Extensions

According to those assumptions specified above, we can write the quantity theory equation as below:

$$\Delta M + \Delta V = \Delta P + \Delta Y \qquad (1)$$

Moreover, since V is fixed than the equation will be:

$$\Delta M = \Delta P + \Delta Y \qquad (1a)$$

Similarly:

$$\Delta P = \Delta M - \Delta Y \qquad (1b)$$

The theory assumes that economy operates at full output level in the long run. As per result, output level will be constant so, the equation will shift to:

$$\Delta P = \Delta M - \text{CONSTANT} \qquad (1c)$$

The equation above means that changes in inflation rate or price level will be equal to changes in money supply minus CONSTANT (real GDP).

CHAPTER 2

LITERATURE REVIEW

Albania has tried its best to develop due to the fact that it is an under developed country. Deepest attention from respective authorities is given to inflation and money supply as two of the most influential and important aspects of economy. There are given different views and perceptions from writers/authors, regarding these important issues in different periods of time of a country's economy.

Referring the correlation between these two components, almost all of these authors agreed that inflation most accepted definition is "a rise in average aggregate prices of goods in a specific country", while money supply is best described as total quantity of money that is available in a certain country. From the definition, rise in average aggregate prices of goods in a specific country, is described as the inflation. If there is a change in money supply, it will by directly change in inflation rate of a country. In this section we are going to discuss about the relationship among money growth and inflation in their countries by explaining different point of views from different authors. According to Xiao-Lin Li, Tsangyao Chang and Chun Jiang in their research 20" Money growth and inflation in China (2001), money growth rate – inflation relationship is analyzed by making use of wavelet analysis. Inflation - money growth relationship in China has been modeled by both authors in a new approach, different from all previous works.

During time interval taken into account (mid 1990 – early 2000's),Xiao-Lin Li, Tsangyao Chang and Chun Jiang research conclude that the analyzed relationship is statistically important, although not homogeneous. Compared to previous years, since the early 2000s, in terms of inflation management, China's monetary policy has continued to improve. Furthermore, this study showed that in the medium or long run, inflation - money growth relationship is positive, i.e. they move in the same direction.

This is assisted from a frequency-domain view given that it is exposed toward shocks and lag effects. The conclusion that can be gf·∘ them for China is that the modern quantity theory of money (QM) is supported by the proved relation among inflation and Money growth in moment 0, while the modern QTM is based on: (1) Money growth in moment 0 and inflation/ Money growth in moment 2 and inflation; (2) is enhanced in medium-run. However, generally, over the past two decades, China has suffered from the so called transition and from structural changes, so Xiao-Lin Li, Tsangyao Chang and Chun Jiang research results fit well with that.

Their paper provides some positive outcomes for China and a general broad view of monetary policy mechanisms, based on the above analysis. Based on the case study "Money growth and Inflation", regime switches approach a so called "Markov Switching model" which takes in account changes over time, is designed. Two regimes of inflation are characterized by low and high inflation' and depending on money growth the probability of regime changes. By using Bayesian techniques and data during 1960-2000' data they have applied the model to: Germany, the US, the UK and Canada.

This estimation: (1) suggests measuring instrument of money growth, (2) recognizes and account time varying component, (3) account for effect of different inflation regimes over output growth. As a consequence, money growth has resulted to be a crucial factor for anticipating price variability. Referring to the study of Michael Christcnscnv (2008) "The money growth inflation relationship and Real supply shocks" was made the analyze about how monetary policy is affected by real supply shocks. As a result, it was concluded that money growth - inflation relationship varies in terms of time, i.e. (1) in

long term relationship is unitary (one to one relationship), (2) in short terms relationship is characterized by some observed but unexplained deviations. It is empirically confirmed that the long run money growth - inflation relationship characteristic are proved for the United States; but short run money growth - inflation relationship characteristic have not been proved in reality. It is only concluded that theoretically speaking, short run deviations are consequence of real supply shocks. Another point of view is reflected at Igor Pelipas (2006) the study of "Money demand and inflation in Belarus. Evidence from cointegrated WAR". In his paper is analyzed the real money balances (M1) and demand for nominal in Belarus, data for 1992-2003 on the basis of the quarterly. Well satisfied short-run and stable long money demand functions derived by using (1) co integration approach and (2) dynamic equilibrium modeling. The relationship among money demand and supply is based on real money demand functions. Dynamic equilibrium modeling and the velocity of achieving equilibrium steady-state are studied in short term for the market of real money.

In Belarus independent variables that affect inflation are studied through simple equilibrium analysis of real money demand functions. Cointegration method is used also at the study of Georges de Menil, Nina Budina, Wojciech Maliszewski,Geomina Turlea with main title Money, inflation and output in Romania, 1992-2000. Menil, Budina, Maliszewski & Turlea apply Johansen procedure in order to analyze cointegration relationship. According to their results, only exogeneity of output hypothesis is accepted, while all other hypothesis that supposed a statistically significant relationship is rejected.

Of course, works of authors integrate other scholars works, and the study of Menil, Budina, Maliszewski & Turlea has converged with Caganl and even more is considered as a competition of money demand prediction model of Caganl.

One common shortness of these models is that these relationships are proved only in long term. Menil, Budina, Maliszewski & Turlea have tried to model the relationships even in short run, but unexpected residuals of real money has substantially lowered statistical significance, making the relationship irrelevant in short period of times.

ElShagi & Giesen (2013) have studied inflation- money supply relationship in the context of USA. Authors have tried to prove the significance of the relationship in short run. They make use of multivariate statistics. Authors made possible to achieve this objective, by making thus a substantial contribution in field literature. When analyze the effectives of Fed's monetary policies to respond to crisis, they conclude that indeed if Fed's monetary policies are based on multivariate results may be effective and lower inflation. USA economy research data were taken in a time interval characterized by (1) inflation > 396 percent and (2) expansive monetary policies. According to these results, USA had two strategies: (1) Restrictive monetary policies- they would have small negative externalities, and (2) expansive monetary policies- they would have large negative externalities, including an increased inflation.

Wesche & Gerlach (2008) analyzed three variables movement in high and low frequency: (1) Money growth (2) output (3) inflation. According to them high and low frequency is a consequence of different behaviors of banks that may be or may be not interested in impacting monetary supply. Given this, authors' main research question is: "How can money supply influence monetary policies?" Authors suggest that money supply in itself is not sufficient in impacting monetary policies, but it must be strengthen with other macroeconomic indicators. Wesche & Gerlach define (1) low frequencies- periodicity > four years, (2) high frequencies- periodicity < four years, (3) inflation is caused in low and high frequencies.

Authors evaluate Phillips curve by stating that in them it can be tracked factors that are not a regular element that compose of the money supply. Belke &Polleit, have evaluated if "P. Star" model and WECM proves or not theories and empiric patterns in terms of money supply. In their study: (1) only the time interval late 1980s - beginning of 2005 has been studied; (2) money supply is measured by using "price gap" indicator; (3) statistical proves of significance are available, (4) data are taken from Sweden economy. Their analysis indicates that money supply is a catalyst for monetary policies.

Price & Nasim when researching regarding money supply, take into consideration PPP[2]. According to them PPP is a crucial component of regulating price levels and lowering inflation, especially in long – run. Given this fact, authors study inflation by making use of sophisticated statistical apparatus. They predict inflation with a multivariate contegration equation. In this equation purchasing power parity – money demand relationship, in long run has a satisfactory fit level with P-Star model.

This methodology has been successful when implemented in several other authors research work, but it requires (1) big amount of data given that it is valuable only in long run, and (2) quarterly data. In several countries, such as in Pakistan, this amount of data is not available, therefore it is difficult to prove the existence of patterns discovered by Johansen.

In Pakistan it is possible to evaluate a SUR system, in long run and this has a greater probability to prove the desired correlation. Given this advantage, SUR system converts itself in one of the most beneficial models to be implemented in countries that face the same problem as Pakistan: low quantity of data. Of course the objective of research is still: (1) to test money demand relationship, (2) to test if purchasing power parity and M demand are predictors of price level. All the analysis is conducted in long term periods.

Furthermore, beside purchasing power parity, inflation levels may be lowered by exchange rates as well. We have two identities (1) If CPI[3]< PPP =>exchange rate rises, therefore the domestic currency is depreciate toward foreign currency; (2) If CPI > PPP => exchange rate decreases, therefore the domestic currency is appreciate toward foreign currency. All these implicit relationship are of a great importance for monetary policies.
Baumol &Blinder have defined inflation as: "*increase in general level of an economy's prices*". According to them inflation impacts production distribution and lowers PPP in ceteris paribus conditions (i.e. fixed money incomes), by resulting in a finalized effect of increased inflation.

[2]Purchasing Power Parity
[3]Consumer Price Index

This macroeconomic indicator of the economy lowers the sale of several financial securities. Furthermore, inflation impact on foreign trade is as following: given that for some goods inflation with cause them to be expensive in domestic economy, the country will increase imports on goods that have been greatly impacted by inflation and will produce in those sectors that are not so greatly impacted from inflation (domestic price < foreign price).

Anthony (1980, 132) has in depth analyzed inflation causes. According to him two are the most relevant factors: (1) cartels and (2) workers syndicates. The only market structure that has the power to impose high prices without causing decrease in demand is: monopoly. By exploiting the monopolist power, a monopolist has opportunity to increase product prices without even causing a change in both sides of product market: supply and demand. On the other hand workers syndicates tend to demand increased wage, this will increase production costs, resulting in higher sale prices. Even in this case nor product demand nor product supply are changed.

Parkin & Zis (1976, 234) in their study state that general level of money supply is of a great importance to all economic actors of an economy. The importance derives from the fact that general level of money supply impacts economic growth rate. Although it's great importance, authors remarks that literature has not been able to conclude in a general accepted definition of money supply. This gap creates many spaces and different authors may define it in most utile point of view to match their research field. For example, it is acceptable that money supply is composed by financial assets. Financial assets may be of different categories: checking accounts at banks and saving and loan transactions, etc. The sum of these assets produces Money supply: M1.

Miller (2000, 159) has given a broad view of indicators that signalize that an economy is experiencing inflation. Firstly, it can be said that an economy is experiencing inflation if economic actors itself are causing it. Given that prices are a result of demand – supply interaction, price increase is consequence of two events: (1) demand increase (according to demand law) and/ or (2) supply decrease (according to supply law). The more one or

both these happenings continue the more inflation will be raised. This effect is the same no matter the nature of the product market: physical of financial. Secondly, if the market tends to speculate with its securities, than inflation will arise. Furthermore, the more the lending money is used to buy speculative stocks the more inflation wills an economy experience. Fourthly, if investments prices do not justify its value, than this is a clear indicator of inflation presence.

Fifth inflation indicator regards investments portfolio. In case of inflation investments portfolio, start to be dominated by speculative securities, i.e. securities that may be traded with high prices but have little value. Sixth inflation indicator would be to measure the quantity of speculative investment in total market transactions. Seventhly, we may evaluate the demand for speculative securities. Furthermore, it is possible that we may spot inflation by measuring if the demand for old favorites is greater than fundamentals; or by calculating basket goods price indexes. Lastly, inflation indicators may be searched during forecasts, when prediction analysis of past historical data of inflation shows that in the future we will expect growth of inflation.

Milton Friedman (1993)[4]in analyzing money market supply behavior has made clear the distinction between real money and credit. Friedman suggests that Money growth and money supply are dependent from credit demand. Furthermore, Friedman has analyzed inflation – money supply relationship; and has concluded that between the two variables exists a statistically significant correlation. In concluding this chapter it is important to enhance that: (1) interest rate (real interest rate) & inflation rate intersect money growth rate in an economy where its imports = export = 0 ((i.e. closed); (2) PP[5] of money is valuable only if money yield interest; (3) If money growth < inflation then money supply tend to continually decrease; (4) equilibrium in money markets is important to be sustained by affordable prices and/ or sufficient money supply, in order to avoid the decrease tendency explained in point (3).

[4]"Inflation and unemployment"
[5] Purchasing power

CHAPTER 3

DATA AND METHODOLOGY

We need to gather data which must be relevant, in order to test the theory. In this case the data cover the period from 2010 to 2015. At the Albania data is included the Inflation rate, which is measured by using consumer price index, also is included money growth (M2) referring the table 1 and table 3. The same factors are used for the European developed country (Germany) Concerning Germany data, are used money-quasi money growth (M2) and inflation rate (CPI) exhibited at Table 2 and 3.Data for money supply (M2), money-quasi money growth (M2) and inflation rate are provided by IMF web site shown at tables above. We have used an econometric model, through we can make a statistical test of the quantity theory of money. The equation (1c) is resembled from the model that we have used.

We use a regression equation as below, instead of equation (1c) mentioned above:

Inflation = $\alpha + \beta$*ms

In which :

Inflation: the change of percentage price level

α: is the intercept and reflects the constant in equation (1c)

β: express the slope coefficient value

ms: refers to the quantity of money supply, which change yearly.

Upon this equation, we are going to test the hypothesis that "α" or the constant in equation (1c) is negative and "β" or the slope is almost 1.The research consists on taking in consideration an European developed country as sample to test the quantity relationship between change in money supply and inflation rate. However, this country such as Germany is chose as the most developed country, under the same period of time. This is done in order to compare developing country such as Albania, with a developed country such as Germany. This sample includes one of the most powerful countries in Europe. Summary statistics for the sample country in this example are shown in tables above.

3.1 Data

Level inflation (INF) in Albania;
Level inflation (INF) in Germany;
Money Supply (MS); in Albania
Money Supply (MS); in Germany

The variables that are taken in consideration is the Inflation and Money supply in Albania and Germany. The period of data is from January 2010 to December 2015. Data frequency is monthly. All the data mention above are taken from International Monetary Fund, which is a trustful web site.

3.2 Methodology

To get final result for this study we have used two types of models. The first one is Unit Root Test result and the second one is Autoregressive Distributed Lag Mode. **"Unit Root Test** is a feature of processes that evolve through time that can cause problems in statistical inference involving time series models", definition. If 1 is a root of the process's characteristic equation, a linear stochastic process has a unit root. This process does not always have trend but is non-stationary. The first difference of the process will be stationary, if the other roots of the characteristic equation lie the unit circle that is,

have a modulus less than one. Otherwise, to become stationary the process will need to be differenced multiple times.

Trend stationary process confuses sometimes with unit root processes. They are different in many aspects while they share many properties. The mean can be growing or decreasing over time, in both unit root and trend stationary.

It is called **explosive process** if a root of the process's characteristic equation is larger than 1.

The unit root test equation is as below:

yt'= D +zt+εt

In which

Dt - is the component of deterministic (component that is seasonal, trend, etc.)

Zt - refers to the component stochastic

εt- refers to stationary error process

A distributed lag model is a model for time series data in which a regression equation is used to predict current values of a dependent variables based on both the current values of an explanatory variable and the lag values of this explanatory variable. The equation of it is as below:

$$y_t = \alpha + \omega_0 x_t + \omega_1 x_{t-1} + \omega_2 x_{t-2} + \cdots .. + error\ term$$

Where y_t time period value t of the dependent variable y

α refers to the intercept term to be estimated

and w_i is called the lag weight (also to be estimated) placed on the value *i* periods previously of the explanatory variable *x*

CHAPTER 4

EMPIRICAL RESULTS

4.1 Graphical analysis

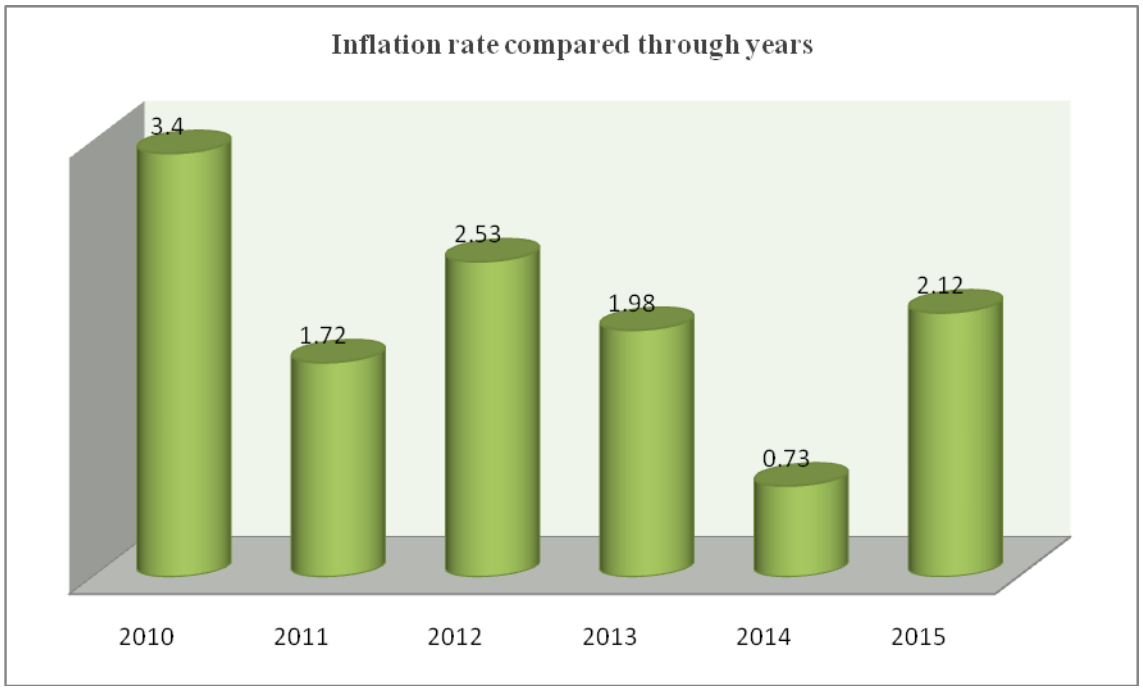

FIGURE 4.1 Inflation rate in Albania over years

TABLE 4.1 Yearly inflation rate in Albania

Year	2010	2011	2012	2013	2014	2015
Percentage	3,33	1,72	2,53	1,98	0,73	2,12

In 2010 the annual inflation rate has reached 0.3 % lower than in the previous year, it reached 3.4 %. During December, the biggest increase occurred to “Food and the beverages without alcohol”, which increased by 4.6 % and within this group the highest increase of 27.0 %, observed in the subgroup “vegetables include potatoes”. Average annual inflation in 2011 stood at 1.72 %. Annual average inflation this year was formed in the mostly by contribution of “processed foods " and " consumables non-food “(78 %). Average annual inflation in 2012 stood at 2.53 %. Fluctuations in inflation during 2012 are related to the increase in fuel prices as a result of the tax to be collected by fuel and a psychological impact on a possible increase in the price of electricity during the year. In 2013, the inflation rate reached 1.98 %, this value 0.55 % lower compared to 2012. The month rate of inflation is high time December, by 1.86 %. As expected, it marks the end of the year an increase often artificial price of goods in the consumer basket.

Focusing on 12 main commodity groups, the group which also marks the highest rate of inflation is that of alcoholic beverages and tobacco by 4.2 %, followed by food and non - alcoholic beverages by 3.5 %. Albania’s inflation rate averaged 1.9 percent in the first quarter of 2014 and in March it decreased to 0,75. Due to the low economy, downward imported inflation and anchored inflationary expectations plus/minus one percentage point Albania inflation rate has remained low. The bank aims to achieve the inflation of 3.0 percent. Clothing and footwear, is the category with the lowest value - 3.4 %.Inflation fell rapidly during the first two months of the year 2015. The average annual inflation rate is 2.12%. Its annual rate down to 0.2 % in February, compared to 2 % level registered in December 2015. Analyzes show that this decline reflects the combined action of three factors : (I) low inflation in food products , particularly food seasonal fresh ; (II) the effect of direct and indirect low oil prices ; and , (III) high comparative base price during the same period a year ago. These three factors explain about ¾ of the decline of inflation during this period.

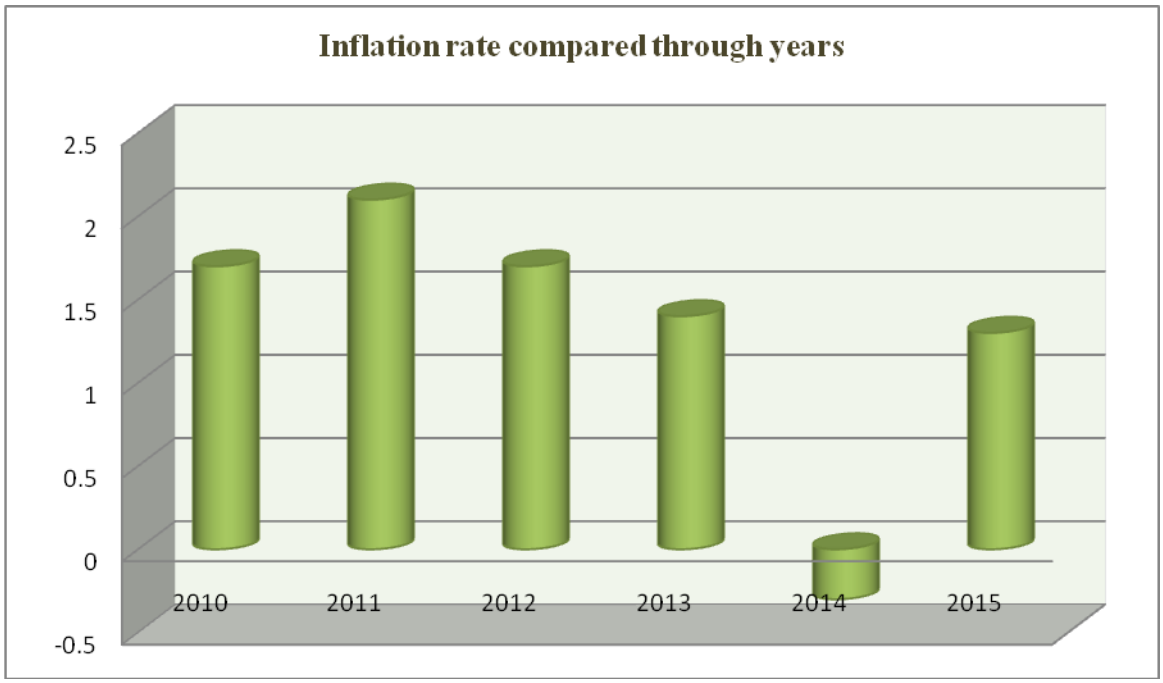

FIGURE 4.2 Inflation rate in Germany over years

TABLE 4.2 Yearly inflation rate in Germany

Year	2010	2011	2012	2013	2014	2015
Percentage	1,70	2,10	1,70	1,40	-0,3	1,30

Often based on the consumer price index or CPI in short terms we refer to the rate of inflation, when we talk about the inflation rate in Germany. The German CPI is compounded by the change in price of a standard package of goods and services which German households purchase for everyday consumption. An assessment is made in order to measure inflation. This assessment is made of how much the percentage terms are risen by CPI in a given period of time in comparison to the CPI in a preceding period. Deflation in other term negative inflation is called the process when prices have fallen. German inflation averaged 1.7 percent in 2010. In more than three years the confidence of German consumer will be closer to the highest level with the decline of unemployment, boosting households' willingness to spend and market research companies. In almost three years in October there was a raise in the retail. In December, sales and the business confidence have started to increase. The food prices increased by

1.2 percent within a month and 3.8 percent within a year, in Germany, in the state of North Rhine- Westphalia. Heating oil was more expensive than a month ago approximately 5.6 percent higher costing 28.7% more than last year in last month. Crude oil price has raised more than 6 percent in the past month. Due to the Christmas holiday season, the package tours price was more than 20 percent in December. "A bigger monthly increase in the consumer price index is normal in a December seasonal patterns" said a statistician Thomas Kraemer at the Federal Statistics Office. Living cost experienced further decrease even when compared with 2012 (2% decrease) and 2011 (2.1 % decrease). Reasons that have stimulated the decrease may be several but as the most important factors are considered: (1) deflation of car fuels (decrease rate in 2013= 3.4%), (2) decreased cost of producing heating oil (6% of decrease); (3) decreased price of several goods: coffee & tea (3.3 %), electronics goods (5.9 %), communication (1.6 %).

On the upside concerning prices were primarily groceries fruit and vegetable, up to 72 and 6.1 percent respectively. The most significant rises were recorded for potatoes, i sing by 28.7 percent, and apples which were almost a quarter more expensive than in 2012.According to economists, in Germany there were no tendencies for a general decrease in price levels, although amid robust employment and steady albeit weak growth. From several forecasting analysis, it resulted that in 2014 German economy growth rate would be increased, but this did not happen in reality. Although predicted inflation in 2014 was said would be 1.7%, Germany faced higher levels. In 2013 is registered the lowest historical economic growth rate of Germany. In 2014 and 2014, prices began it increase (0.2% increase in 2014 and 0.3% in 2015), even though all other European countries had negative economic developments.

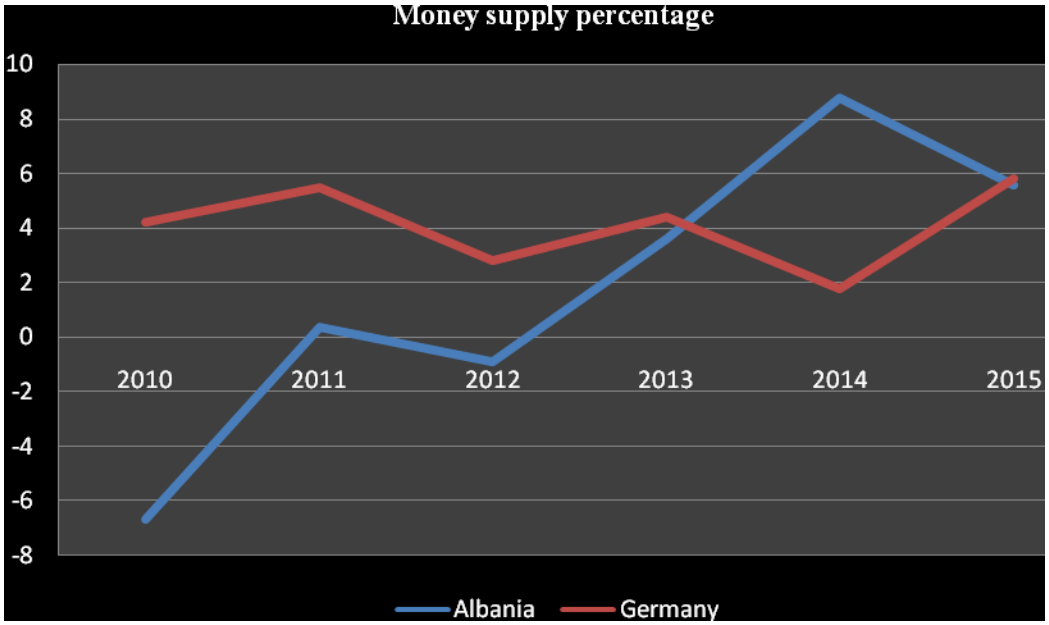

FIGURE 4.3 Money Supply over years

TABLE 4.3 Money supply in Albania and Germany over years

Year	2010	2011	2012	2013	2014	2015
Albania MS in percentage	-6,67	0,39	-0,89	3,62	8,78	5,6
Germany MS in percentage	4,22	5,48	2,80	4,43	1,79	5,82

TABLE 4.4 Money supply in total values for Albania and Germ. during 2010-2015

Year	2010	2011	2012	2013	2014	2015
Albania in milion ALL	2.365.59	2.365.29	2.777.82	2.444.28	2.522.716	2.791.43
Germany in milion EUR	2.499.61	2.723.962	2.736.088	2.810.792	2.828.382	3.036.750

Even if after communism has recovered the economic and social aspects of development, many of macroeconomic indicators have been stable and have achieved

the forecasted values, Albania still remains to be a developing country under progress. On 2006 Bolle and Meyers made a study toward Albania economy. They stated that national currency, as an important indicator for Albania economy. Even if it has been mainly stable, the high levels of dollarization caused a within a month and 3.8 percent within a year, in Germany, in the state of North Rhine- Westphalia. Heating oil was more expensive than a month ago approximately 5.6 percent higher costing 28.7% more than last year in last month. Crude oil price has raised more than 6 percent in the past month. Due to the Christmas holiday season, the package tours price Was more than 20 percent in December. "A bigger monthly increase in the consumer price index is normal in a December seasonal patterns" said a statistician Thomas Kraemer at the Federal Statistics Office. Living cost experienced further decrease even when compared with 2012 (2% decrease) and 2011 (2.1 % decrease). Reasons that have stimulated the decrease may be several but as the most important factors are considered: (1) deflation of car fuels (decrease rate in 2013= 3.4%), (2) decreased cost of producing heating oil (6% of decrease); (3) decreased price of several goods: coffee & tea (3.3 %), electronics goods (5.9 %), communication (1.6 %).

On the upside concerning prices were primarily groceries fruit and vegetable, up to 72 and 6.1 percent respectively. The most significant rises were recorded for potatoes, i sing by 28.7 percent, and apples which were almost a quarter more expensive than in 2012.According to economists, in Germany there were no tendencies for a general decrease in price levels, although amid robust employment and steady albeit weak growth. From several forecasting analysis, it resulted that in 2014 German economy growth rate would be increased, but this did not happen in reality. Although predicted inflation in 2014 was said would be 1.7%, Germany faced higher levels. In 2013 is registered the lowest historical economic growth rate of Germany. In 2014 and 2014, prices began it increase (0.2% increase in 2014 and 0.3% in 2015), even though all other European countries had negative economic developments.

In the above table and graph is visually represented change in money supply (in %)[6] for "for the money supply growth in Germany. The money plus time deposits[7] that are available in a country economy are part of money supply. Money supply growth causes inflation with a high velocity. This Indicator is calculated month by month by Dutsche Bundesbank (EUR Billion). Cash and other assets that may be quickly converted into cash are considered the highest liquidity asset that includes in money supply.

4.2 Unit Root Test result

In the table 4,2 are the results of unit root test. As it is seen the data are stationary. Money supply and inflation in Albania has a P- value of 0. This means that data are stationary in level.

TABLE 4.5 Unit Root Test Results

Variable	*ADF-test*	*P-value*
GMS	-3,42732	0,001
GGINF	-3,7231	0,0005
AGINF	-9,138629	0
AGMS	-8,26196	0

[6]change in money supply (in %)- broad money" / money plus quasi money
[7]checking and savings accounts

4.3 Autoregressive Distributed Lag Model

At the table below are reflected the autoregressive distributed lag model, where dependent variable is Albania Inflation. The samples are taken from monthly data. As it is indentified from the results, for the first month the data are significant. It means that an increase in money supply in Albania, does not gives effect in the first month. The effect is after the second month as the P-value is 0,0059. At this moment data are significant. After the second month that money supply increases or decreases it has a positive impact in the level of the relationship. The coefficient after two months is 0,159599, which means the impact is positive. Giving effect after the second month, means that the economy is moving in slow motion. In all studies that are made from different authors, in most countries, the effect of the money supply on inflation gives effects from the first month are significant.

TABLE 4.6 ARDL Results

Dependent Variable *AGINF*	*Coefficients*	*Standard Error*	*t Stat*	*P-value*
AGMS	0,102148	0,070013	1,458989	0,1495
AGINF(-1)	0,748318	0,142903	5,236559	0
AGINF(-2)	-0,22689	0,13841	-1,63925	0,1061
AGMS (-1)	-0,08989	0,066733	-1,34703	0,1827
AGMS (-2)	0,159599	0,056075	2,846154	0,0059

Lets have look on the Germany results. At the table 4.3.1 is reflected the Germany situation. As it is seen, the impact that money supply gives in this country is immediately. At the moment that has a change in money supply, the impact of inflation is immediate. Also at the second month it is significant, but at the second month it is not significant any more. We conclude that in Germany, money supply impact immediately

the inflation, also in the first month. After the first month it does not affect any more. As it is known, Germany economy is very developed and aggressive. It is named as locomotive economy of the Europe.

TABLE 4.7 ARDL
Test Results for Germ.

Dependent Variable *GGINF*	*Coefficients*	*Standard Error*	*t Stat*	*P-value*
GGMS	0,0479	0,021541	2,227594	0,0294
GGINF(-1)	0,034731	0,120891	0,287294	0,7748
GGINF(-2)	-0,23452	0,099753	-2,35098	0,0218
GGMS (-1)	-0,12519	0,0235	-5,32723	0
GGMS (-2)	0,005936	0,027607	0,215032	0,8304

CHAPTER 5

CONCLUSIONS

5.1 Overall Conclusions

Albania is an under developing European country which is still in transition period from 1990. The geographic position of this country is situated in a perfected place since it is the bridge that connects the East Europe with West of it. Even if it has approximately 26 years that has passed in free market economy, again it is facing serious difficulties. There are a lot of factors that affect the instability in this country, but the most important factors are; high level of corruption, justice reform, informality and property problems. For many years Albania economy is suffering this situation because of the non-solving of these problems.

On other hand, Germany, as one of the most powerful country in world is still driving the economy of Europe. It is one of the most important components of the European Union, since the United Kingdom is leaving the Union. Now it has more responsibilities in the fate of the EU.

All mention above is reflected in this study, and as a conclusion is gained that Albania economy is still moving in slow motions. Referring to the results of unit root test and autoregressive distributed Lag model, is concluded that the money supply gives its effect after the second month. This happens because of the low economy level of Albania; also another reason is the informality.

The same thing has happened in different developing country in the world such as Afghanistan. In Albania, the informality and dirty money are in high levels. A large amount of money in circulation comes from illegal activities such as drugs, prostitution, guns trade, money laundering and fiscal evasion. These factors cause directly the increase of the inflation rate in artificial way. In this moment the correlation between money supply and inflation is not so significant. This is one of the reasons that a change in money supply, gives its effect after the second month in Albania. The opposite situation is reflected in Germany. It is a developed country and has a high controlled economy. For that reason the impact of money supply on inflation is immediate.

5.2 Implications

The two variables that are selected for this study are monthly money supply and monthly inflation in case of Albania and Germany. Regarding to previous studies in different countries about the impact of these two factors, is stated that there is a positive correlation between money supply and inflation. This correlation is confirmed also in our model used for the study, even if in Albania case the impact was after the second month.

5.3 Limitations of the study

As mention before, the data of this study are taken from the web site of IMF. There exist different sources in which many data are available especially for Albania case, but most of them offers different data for the same thing. The sources that are considered as trustful ones, does not serve the real data. As an example can be mention Bank of Albania and Instat. These two institutions are responsible for gathering information and data for Albania economy and publishing them in their web sites. After many researches in this study was gained that the data was not the same in these two institutions. Since Albania has still significant governance problems, these institutions are not free to show the real data and real situation. For that reason we were obliged to trust a foreign source such as IMF.

5.4 Further Studies

This study tried to prove the existence of the relationship between money supply and inflation. It doesn't mean that after this study it is not needed to make other researches in this kind of topic. Especially the case of Albania, which has an economy, that surprises the general economy rules. It is suggested that during all the time to make such kind of study in focus of this topic. For our opinion is better that this studies to be done from the government institutions such Bank of Albania, Ministry of Economy, Ministry of Finance. Since these two economy components are directly in responsibilities of these institutions, they are obliged to make studies in periodic time, in order to reflect the Albania results.

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APPENDIX

Monthly data for Inflation and Money Supply in Albania and Germany

Month	Albania Inflation	Albania Inflation in %	Albania MS in million Eur	Albania MS in %	Germany Inflation	Germany Inflation in %	Germany MS in million Eur	Germany MS in %
December 09'	98,96		216.767,58		99,61		207.693,00	
January 10'	99,89	0,93	207.515,67	-4,27	99,01	0,40	201.828,00	-2,82
February 10'	100,99	1,10	205.552,77	-0,95	99,41	0,50	202.097,00	0,13
March 10'	101,08	0,08	203.282,91	-1,10	99,91	0,10	205.369,00	1,62
April 10'	100,63	-0,45	201.115,15	-1,07	100,01	-0,10	205.635,00	0,13

May 10’	99,44	-1,19	201.752,30	0,32	99,91	0,00	207.488,00	0,90
June 10’	98,73	-0,71	201.869,98	0,06	99,91	0,20	209.239,00	0,84
July 10’	98,23	-0,49	204.850,49	1,48	100,11	0,10	211.415,00	1,04
August 10’	99,00	0,76	206.039,08	0,58	100,21	-0,10	209.752,00	-0,79
September 10’	99,71	0,72	200.112,97	-2,88	100,11	0,10	209.657,00	-0,05
October 10’	99,91	0,20	199.003,24	-0,55	100,21	0,10	210.123,00	0,22
November 10’	100,10	0,19	198.021,52	-0,49	100,31	0,60	210.595,00	0,22
December 10’	102,29	2,19	202.386,72	2,20	100,91	-0,20	216.413,00	2,76
January 11’	103,15	0,86	195.051,23	-3,62	100,71	0,60	211.233,00	-2,39
February 11’	105,51	2,37	194.827,01	-0,11	101,31	0,60	211.000,00	-0,11
March 11’	105,42	-0,09	193.691,38	-0,58	101,91	0,00	212.027,00	0,49
April 11’	104,79	-0,63	195.830,44	1,10	101,91	0,00	214.667,00	1,25
May 11’	103,65	-1,15	196.655,44	0,42	101,91	0,10	215.581,00	0,43
June 11’	102,54	-1,11	197.891,89	0,63	102,01	0,20	217.866,00	1,06
July 11’	101,81	-0,74	198.693,73	0,41	102,21	0,10	220.034,00	1,00
August 11’	102,07	0,27	198.956,71	0,13	102,31	0,20	218.566,00	-0,67
September 11’	102,50	0,42	197.771,51	-0,60	102,51	0,00	220.462,00	0,87
October 11’	102,94	0,44	195.820,28	-0,99	102,51	0,20	222.262,00	0,82
November 11’	103,00	0,06	197.202,19	0,71	102,71	0,20	223.146,00	0,40
December 11’	104,01	1,02	202.906,55	2,89	102,91	-0,10	228.412,00	2,36
January 12’	104,75	0,74	197.613,39	-2,61	102,81	0,70	223.397,00	-2,20
February 12’	106,13	1,38	196.427,34	-0,60	103,51	0,60	223.066,00	-0,15
March 12’	106,52	0,39	195.450,52	-0,50	104,11	-0,20	223.774,00	0,32
April 12’	106,46	-0,05	194.744,47	-0,36	103,91	0,00	224.797,00	0,46

May 12’	105,66	-0,80	194.689,59	-0,03	103,91	-0,20	227.153,00	1,05
June 12’	104,77	-0,89	195.731,76	0,54	103,71	0,40	229.846,00	1,19
July 12’	104,58	-0,18	196.989,41	0,64	104,11	0,40	230.886,00	0,45
August 12’	104,98	0,39	197.469,47	0,24	104,51	0,10	230.548,00	-0,15
September 12’	105,20	0,22	195.667,71	-0,91	104,61	0,00	229.591,00	-0,42
October 12’	105,41	0,22	193.494,63	-1,11	104,61	0,10	229.346,00	-0,11
November 12’	105,61	0,20	194.855,60	0,70	104,71	0,30	228.945,00	-0,17
December 12’	106,55	0,93	200.898,67	3,10	105,01	-0,50	234.739,00	2,53
January 13’	107,58	1,04	193.000,12	-3,93	104,51	0,60	227.139,00	-3,24
February 13’	108,76	1,18	192.517,22	-0,25	105,11	0,50	226.528,00	-0,27
March 13’	109,04	0,28	195.056,00	1,32	105,61	-0,50	230.654,00	1,82
April 13’	108,90	-0,14	198.302,66	1,66	105,11	0,40	232.008,00	0,59
May 13’	107,83	-1,07	204.408,09	3,08	105,51	0,10	233.016,00	0,43
June 13’	107,18	-0,65	212.177,69	3,80	105,61	0,50	234.530,00	0,65
July 13’	106,29	-0,89	210.750,55	-0,67	106,11	0,00	235.536,00	0,43
August 13’	106,20	-0,09	211.326,89	0,27	106,11	0,00	235.793,00	0,11
September 13’	107,02	0,82	208.196,11	-1,48	106,11	-0,20	235.599,00	-0,08
October 13’	107,17	0,15	205.093,52	-1,49	105,91	0,20	237.046,00	0,61
November 13’	106,66	-0,51	205.666,14	0,28	106,11	0,40	237.863,00	0,34
December 13’	108,52	1,86	207.792,72	1,03	106,51	-0,60	245.080,00	3,03
January 14’	109,36	0,84	203.945,93	-1,85	105,91	0,50	228.260,00	-6,86
February 14’	110,84	1,48	203.205,39	-0,36	106,41	0,30	228.649,00	0,17
March 14’	111,41	0,57	203.057,70	-0,07	106,71	-0,20	230.000,00	0,59
April 14’	110,75	-0,66	201.702,97	-0,67	106,51	-0,10	232.373,00	1,03

May 14’	109,53	-1,21	203.418,65	0,85	106,41	0,30	233.556,00	0,51
June 14’	108,79	-0,75	207.779,33	2,14	106,71	0,30	234.947,00	0,60
July 14’	108,23	-0,56	211.218,89	1,66	107,01	0,00	237.394,00	1,04
August 14’	108,32	0,09	215.549,82	2,05	107,01	0,00	237.783,00	0,16
September 14’	108,61	0,29	215.653,52	0,05	107,01	-0,30	237.830,00	0,02
October 14’	108,73	0,11	213.788,43	-0,86	106,71	0,00	238.759,00	0,39
November 14’	108,41	-0,31	216.961,23	1,48	106,71	0,00	240.142,00	0,58
December 14’	109,25	0,84	226.434,14	4,37	106,71	-1,10	248.689,00	3,56
January 15’	110,73	1,47	224.009,70	-1,07	105,61	0,90	244.101,00	-1,84
February 15’	113,36	2,63	226.134,30	0,95	106,51	0,50	244.894,00	0,32
March 15’	113,83	0,47	225.389,52	-0,33	107,01	0,00	247.195,00	0,94
April 15’	113,27	-0,55	225.810,98	0,19	107,01	0,10	249.649,00	0,99
May 15’	111,47	-1,80	231.281,96	2,42	107,11	-0,10	251.008,00	0,54
June 15’	110,28	-1,19	236.301,16	2,17	107,01	0,20	253.399,00	0,95
July 15’	109,54	-0,74	239.515,59	1,36	107,21	0,00	256.980,00	1,41
August 15’	110,38	0,84	239.098,57	-0,17	107,21	-0,20	256.390,00	-0,23
September 15’	111,04	0,66	235.535,10	-1,49	107,01	0,00	255.904,00	-0,19
October 15’	111,04	0,01	234.678,13	-0,36	107,01	0,10	256.314,00	0,16
November 15’	110,69	-0,36	234.461,25	-0,09	107,11	-0,10	257.510,00	0,47
December 15’	111,37	0,68	239.218,06	2,03	107,01	-0,10	263.406,00	2,29