

T.C.
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SOSYAL BİLİMLER ENSTİTÜSÜ
İKTİSAT ANA BİLİM DALI
İKTİSAT (İNG) BİLİM DALI

**PRODUCTION, PROFIT AND MONEY:
CLASSICAL THEORY OF INFLATION AND ITS APPLICATION TO
EUROPEAN COUNTRIES**

MA Thesis

OKTAY ÖZDEN

İstanbul, 2020

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Supervisor: Dr. Öğr. Üyesi M. NEDİM SÜALP

İstanbul, 2020

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ABSTRACT

This thesis aims at analyzing the dynamics of the inflation. It explains driving and resisting sources of inflation. In this thesis, methodology of economic analysis depends upon one of the crucial scientific laws, known as the law of emergent property. In economics, this law requires focusing on interactions of economic agents. In the literature, classical theory of inflation, bases on this ex-post foundation, is the most recent theory in which emergent property is taken into account. This theory in this thesis is tested for 26 European economies during the period 2007-2018. Using data from Eurostat and European Central Bank, ARDL type of dynamic fixed effect model is estimated for the testing driving and resisting sources of inflation. Findings are consistent with the theory. Results demonstrate that inflation is influenced positively by newly created purchasing power; negatively by unutilized growth capacity; and positively by rate of profit. An important point in the findings is that profit rate influences positively to inflation instead of negatively effect of rate of profit, which drives production. For 26 European economies during the period 2007-2018, this important finding shows that inflation is influenced positively (rather than negatively) by rate of profit as a result of existing credit expansion (especially until 2015) exceeded maximum rate of growth. So, newly created purchasing power was not sufficiently absorbed by supply dynamics of the inflation.

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ÖZ

Bu tez, enflasyon dinamiklerini çözümlemeyi amaçlamaktadır. Enflasyonun itici ve direnç kaynaklarını açıklamaktadır. Bu tezde kullanılan iktisadi analizin methodolojisi, kritik öneme sahip olan bilimsel kanunlardan biri olan belir fenomen yasasıdır. İktisatta bu yasa, iktisadi aktörlerin etkileşimlerine odaklanmayı gerektirmektedir. Klasik enflasyon teorisi literatürde bu hakiki temele dayanan, beliren fenomen yasasının dikkate alındığı en güncel teoridir. Bu teori, 2007-2018 yılları boyunca 26 Avrupa ekonomileri için bu tezde test edilmiştir. Avrupa İstatistik Kurumu ve Avrupa Merkez Bankası'ndaki veriler kullanılarak ARDL türü dinamik sabit etki modeli, enflasyonun itici ve direnç kaynaklarının test edilmesi için tahmin edilmiştir. Bulgular teori ile tutarlıdır. Sonuçlar, enflasyonun yeni yaratılan satın alma gücü tarafından pozitif; kullanılmayan büyüme kapasitesi tarafından negatif; ve kar oranları tarafından pozitif etkilendiğini göstermektedir. Enflasyonun, üretimi dürtüleyen kar oranları tarafından negatif etkilenmesi yerine pozitif etkileniyor oluşu, bulgulardaki önemli bir noktadır. 2007-2017 yılları boyunca 26 Avrupa ekonomisi için saptanan bu önemli bulgu, özellikle 2015'e kadar, var olan kredi genişlemesinin maksimum büyüme oranını aşmasının sonucu olarak enflasyonun, kar oranları tarafından negatif yerine pozitif etkilendiğini göstermektedir. Dolayısıyla, yeni yaratılan satın alma gücü, enflasyonun arz dinamikleri tarafından yeterince emilememiştir.

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LIST OF ABBREVIATION

rr'_I	Net Profitability
AC	Average Cost
$ACSS$	Automated Clearing Settlement System
AFC	Average Fixed Cost
$ARDL$	Autoregressive Distributed Lag
AVC	Average Variable Cost
BC	Bank Credit
C^D	Credit Demand
C^S	Credit Supply
CL	Corporate Levy
DFE	Dynamic Fixed Effect Estimator
ECB	European Central Bank
ERC	Engineer-rated Capacity
FC	Fixed Cost
g_{YR}	Actual Output Growth
GDP	Gross Domestic Product
GMM	Generalized Method of Moments
$GOSR$	Gross Operating Surplus
H	Monetary Reserves
$HICP$	Harmonized Index of Consumer Price
IGR	Gross Real Investment
LD	Loan & Deposits Line
$LVTS$	Large-Value Payment System
MA	Monetary Aggregate
MB	Monetary Base
MC	Marginal Cost

<i>MG</i>	Mean Group
<i>MIER</i>	Components of Money Multiplier
<i>NOS</i>	Net Operating Surplus
<i>P*</i>	Normal Price
<i>PGM</i>	Pooled Mean Group
<i>pp</i>	New Purchasing Power
<i>r'</i>	Rate of Growth Utilization
<i>SOR</i>	Standard Operating Ratio
<i>Target2</i>	European Automated Real-time Gross Settlement Express Transfer System
<i>TC</i>	Total Cost
<i>TFC</i>	Total Fixed Cost

1. INTRODUCTION

Inflation have been one of the main concerns of economics. So, price stability policy is central and primary target in almost all of modern economies. In the education of economics, inflation have been taught as it is always monetary phenomenon since especially 1980. This emphasis was firstly plugged into economic literature by Milton Friedman. According to Friedman (1963), inflation is a monetary phenomenon every time in everywhere. This point of view ignores supply and demand dynamics of inflation. Its main concern is money supply. However, inflation is not just about printing money. There are driving and resisting forces, which determine motion of price. This thesis, in a sense, intends to examine these forces.

In order to understand supply dynamics, we give general view about capitalist mode of production in the next chapter. We explain respectively how does capitalist system work, what are the gears of the production, and what is the fuel of system. We portray the general mechanism of economy. We begin to express briefly how production realizes and explain what are the dynamics of production. In this point, labour and capital inputs are becoming importance. So that, production function comes into main concern. Then, we state where neoclassical economics is located in the explanation of production in an economy. We tell what they concern. Lastly, we express post-Keynesian explanations. In this part, aggregation problem in which Cambridge Capital Controversy is about, is coming into picture. So, we explain scientific rule, which is also scientific foundation of this study. This is an emergent property. In this scientific rule, interaction, which is completely ignored by mainstream economics is a central phenomenon to understand both nature and society. After that, in the third chapter, we investigate formation of price, cost and profit. Therefore, we survey the literature. There are three important theoretical explanations of the issue: I. Neoclassical theorem, II. Post-Keynesian theorem, and III. Fixed technical coefficient or classical theorem. Then, we express three theories of competition. Perfect and imperfect competitions are widely known. We also explain Shaikian theory of real competition in which emergent property is central. Until this chapter, we try to understand the supply dynamics of inflation.

In the chapter four, we start to explain the demand dynamics of the inflation. In this chapter, monetary theories of both mainstream and heterodox economics. We briefly explain three mainstream theories of money. Then, we pass heterodox theories in which post-Keynesian and European circuitist theories are central. We focus more on circuit theory of money and then extend circuitist monetary theory of production. In this chapter, we emphasize that there is no limit for monetary expansion under the fiat money system. In this money system, credit is a form of purchasing power, is also form of money in which it exists without reserve. This is called “loan creates deposit” in the literature. And more, one of the crucial things is that central bank cannot determine and control all of money supply. It just affects growth of money supply. Moreover, this is, in most of the time, an attempt that they do not prefer to do. In the fiat money system, approximately 93 percent of money supply is credit, which is created by banking sector. In addition, we explain difference of point of view between mainstream and heterodox economics. In this chapter, we try to understand roles and interactions of the agents within the process of money creation or purchasing power of money.

Chapter five summarizes classical theory of inflation. This also called “demand pull & supply resistance theory of inflation”. It depends upon both supply and demand dynamics of inflation that we cover previous three chapters. This is quite new theory of inflation. Then, in the chapter six, we present sample of this research and its data sources. Sample are consisting of 26 European economies during the period 2007-2018. Also, we report summary statistics of sample. Then, chapter seven includes some methods of explanatory data analysis in order to understand general structure of sample. In the chapter eight, panel data methodology is presented. ARDL type of dynamic panel model is used in this study. Requirement tests of stationarity and cross-sectional dependence are reported in the chapter nine. In this chapter, empirical results are presented. According to the empirical results, inflation is positively influenced by credit and profit variables, whereas it is influenced negatively by growth utilization variable. Important point in here is that effect of rate of profit on inflation is normally expected negative as a result of that production is driven by profitability; so that, inflation is expected to decline when output increases. However, it can

be positive in some condition in which demand dynamics as a result of stimulus policies become more dominant on inflation. This means that newly created purchasing power is not absorbed by supply side of economy. Another reason is that profitability is main concern for banks to approve firms' credit demand. So, profit rate may affect indirectly positive to inflation via total credit. This point is also the connection between classical theory of inflation and circuit theory of money.

In sum, thesis aim to contribute literature on the two important points. First one, in the classical theory of inflation, we consider that Anwar Shaikh did not give a sufficient explanation of money creation. We present wide explanation on the process of money creation and circulation. In a sense, we link especially circuitism with the classical theory of inflation. This completes some of absence or insufficient parts of demand dynamics in the classical theory of inflation. My aim is contributing Shaikh's theory with wide explanation of the processes of money creation and circulation. On the other hand, econometric part of this thesis presents new findings, which support classical theory of inflation. These findings are also presented for the aiming to understand the supply and demand dynamics of the 26 European economies during the period 2007-2018.

2. CAPITALIST PRODUCTION

Capitalist mode of production is the system of organizing production and distribution, which depends upon wage labour and private property of the means of production under the production technology. In this mode of production, people are dispossessed from means of production. So, wage labour is compulsive reality of people in society in order to sustain their life. Essence of the system is extraction of surplus value. Realizing the surplus value as profit in money form is a process, which belongs to exchanges in market. Profit is requirement of capital accumulation for firms. Capital accumulation is strictly connected with profitability. Marx' formulation of circuit of capital $M-C-C^*-M^*$ is useful method for identification of capital and purpose of production. (Marx 1977, chap. 4). Typical accumulation process begins with money (M). Group of people called capitalists spend their money by buying labour force and commodities (C), which represent machine, equipment, raw materials, and other facilities. After production process, capitalist, who is owner of business, obtains bigger value (C^*) than the value (C) which represents labour force and commodities in the beginning of production. According to the Marx, this surplus comes from the value, which is not paid back to worker for his labour activity. (Marx 1977, chap. 5). Then realizing bigger value (C^*) in market creates extra amount of money (M^*), which is contained by profit. This money (M^*) is bigger than the money, which capitalist starts with. This is the purpose of the whole production process. So, profit is fuel of the capitalism. In this form of production, things are transformed into capital not because of its qualification but because process that it operates. For instance, as taste of fruit is prominent and main feature for the purpose of consumption, profitability of fruit is central and importance of its taste means just that end in circulation of capital. (Shaikh 2016, chap. 6). Capitalism is the system of production in order to obtain profit. Therefore, production process aims to acquire profit. So, produced commodities has to be sold for realizing profit, which is money form of surplus value. Capitalism is most of time perceived as a system of exchanges in appearance. But, production is the essence or content beneath the appearance.

On the other hand, in mainstream economic theory, exchange is the central organization of capitalism. It focuses on market process. In the Neoclassical textbooks, general equilibrium theory is the central model, which was developed to explain system. It depends upon pure exchange economy that members of society do not have production opportunities. So, economic agents have initial stock as endowments of commodities. It means that commodities are already produced. (Mas-Colell, Whinston, and Green 1995: p. 515-516). However, classical theory¹ called by Anwar Shaikh is different. It takes into account both production and market processes. Before the distribution of produced commodity, in fact, there are many possibilities of conflict in the production process. Production takes time (Davidson 2011, p.22, p.142) So, it has to exist before distribution of social commodities. Production must be fed by labour force and other commodities continuously. So, capitalist has to reinvest on labour and means of production. Purpose of this process is making profit. This intention causes that commodities turn into capital. In the Marx' notion $M-C-C^*-M^*$, surplus between initial money (M) and money (M^*), which is obtained in the end of the process comes from production. This is a process that capital expands. It is consisting of labour force, machines, equipment and other facilities. Marx distinguished capital into two; I. labour force as a variable capital. Because, it is unique commodity in market that its usage creates value. II. Means of production (raw material, machine, equipment and other facilities) as a constant capital. And, main difference between Marx and Ricardo is that Marx explained that where this surplus comes from is variable capital or labour force. Because, wages, which is capitalists' monetary payment to workers for their used labour in production process, are always less than monetary equivalent of what they create in production. It comes into capitalists' pocket as profit if surplus realizes and converts into money in market. On the other hand, constant capital cannot create extra value. Their values are what they are. They are depreciated in production and their values are

¹ Classical theory is not related to neoclassicals. Classical theory is called by Anwar Shaikh: it is approach, which benefits from and depends upon Smith, Ricardo, especially Marx and subsequently Keynes and Kalecki. These are the historical social scientists, who directly aimed to grapple organic, real system. They tried to understand real dynamics. So, it is different from Neoclassicals, who do not aim directly observed system, who interested in idealizing the system and then evaluate real dynamic by depending upon idealizing system. (Shaikh 2016, chap. 1, p. 4-7)

transferred into output by merging labour force. This is briefly what labour theory of value is. (Marx 1977, chap. 3; Foley 2009, chap. 3; Fine 1989, chap. 2-3).

Shaikh (2016) states that according to the neoclassical theory, labour and capital as input entry to production process with a production function. Then, output is suddenly appeared. Input-output analysis is also focusing on relationship outputs and inputs (Leontief 1987). But, labour usage process and production process are disappeared too. In addition, neoclassical production function and aggregation of it are required more explanation. It is focused more in the next subsection. On the other hand, Neo-Ricardian approach built on input-output framework. It focused on prices rather than output. Therefore, labour becomes importance. Because, wage is significant factor for the determination of prices and profit. (Sraffa 1960). And lastly, Keynes and Kalecki concentrate level of effective demand, which drives production. So, it reacted and derived from variation on demand (Keynes 1936; Kalecki 1990; Eichner & Kregel 1974; Eichner 1976).

2.1 Aggregation and debate on production function

Aggregation problem is needed to explain more. Because, it is important to construct thesis on the scientific methodology. As we mention before, capital and labour are inputs for production process. Moreover, production function or technique is also aggregated in neoclassical economics. This theory assumes that almost all of phenomenon in production and market mechanics are identical. They are called in base representative agents. They are ad hoc assumptions in order to link micro and macro phenomenon. As individual firms maximize profit, hyper-rational consumers maximize utility by consuming commodity. They are both homogeneously summed to connect with macro perspective. Aggregated behaviors are summing of representative individual behaviors that it is fundamental of mainstream macroeconomics. However, aggregation causes to a significant problem. Summation of individuals means that individuals are not influenced by other phenomenon such as politics, religion, nationality, patriotism, especially what others think and do, and so on. In reality, aggregated society and firms as a whole have different properties than summation of its identical parts. For instance, whole firms in economy includes interactions of firms.

Interactions create new properties. In today's terminology, aggregates have emergent properties. It is distinguishing whole and summation of its identical parts (Shaikh 2016, 84). It is elementary point of science that it is well-known by physicist, and also classics such as Smith, Ricardo, Marx, and subsequently Keynes and Kalecki.

Emergent properties can be understood clearly with Ideal Gas Law:

$$P.V = n.R.T \quad (2.1)$$

Multiplying pressure (P) and volume (V) of ideal gas is equal to universal ideal gas constant (n) times multiplying quantity of gas particle (R) and its temperature (T). Gas is composed of particles which move perpetually. As long as it becomes widespread, physicists have tried to adapt new micro approach to this macro law. Scientists considered that numerous and irregular particles, which move around within a container, where particles collide with each other and wall of container. Detecting individual pattern is almost impossible because of complexity. However, number of particles, strike macroscopic fields on the container's wall, is statistically equal at given interval time. Pressure is occurred by particles' hitting to container's wall. Number of collision on container's wall rises as long as number of particles and gas volume increase within constant given container. And, speed and collision of particles increase as long as temperature rises. So, aggregate gas law is composed of emergent properties that interactions of particles generate within shaped aggregate. It cannot be inferred from individual representative particle (85). So, it can be applied only a whole within constrained or shaped structure. It is widely-known. So, this result is implied on economics as classics have done. In summarize, average agent as a product of aggregate interactions produces result, which is exactly different than representative agent.

In addition, in the literature, Cambridge capital controversy is exactly about this reality. Robinson (1953-54) refused the measurement of aggregate capital, which is proper to aggregate production function (as cited in Shaikh, 2016, 85). Samuelson (1962) resisted Robinson's attack by producing neoclassical production function, which is compatible with Sraffian type of production system. But it requires an assumption that the ratios of capital to

labour within all industries must to be equal. Subsequently, Garegnani (1970,421) proved this result. Therefore, competitive price of Samuelson has to fit with labour theory of value. So that, Samuelson forsook this result in face of undesirable historical irony (Shaikh 1973, 11-14). Then, Samuelson took shelter in General Equilibrium Theory.

3. DYNAMICS OF THE SYSTEM

After previous chapter, which is consisting of general view of production process in which its explanations of various economics approaches and also scientific base of study, in this chapter, I focus on the supply dynamics of inflation. In order to comprehend resisting source of inflation, formations of cost, price and profit have to be understood.

Inputs are perceived as cost in the view of capitalist. Cost is an important thing in the mind of capitalist because profit is simply difference between price and cost. Main dynamic of capitalism is profit. In fact, profitability is almost everything for firms. In every economic tradition, firms are motivated by profit maximization. Profit is an obligation for sustainable capital accumulation process. In short, understanding of determination of cost, price and profit is crucial to capture motion of the system.

3.1 Formation of cost, price and profit

In the economic theory, there are three main traditions, which explain cost, price and profit. These explanations also are strictly connected with competition. They are Neoclassical, Post-Keynesian and Constant Coefficient Theorems.

3.1.1 *Neoclassical theorem*

Neoclassical theory defines profit, which is precisely total revenue minus total cost. Total cost consists of variable cost and fixed cost. (Mas-Colell, Whinston, and Green 1995, p.135; Varian 2014, p.345). In this abstraction, fixed cost means depreciation of capital stock, K . Simple formulation is:

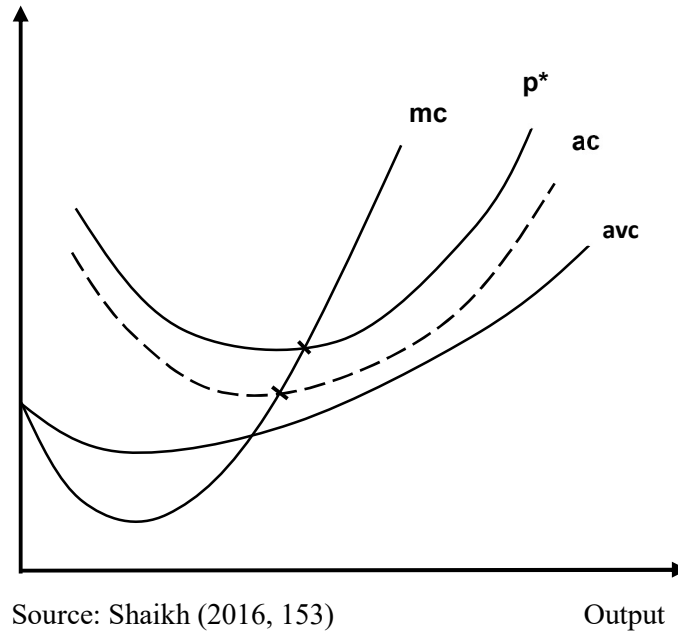
$$D = \delta \cdot K \quad (3.1)$$

Therefore, according to the neoclassical approach, it expands fixed cost by adding normal profit. Mathematically formulated this is:

$$P_n \equiv r_n K \quad (3.2)$$

In this identity, r_n represents rate of normal profit. This attempt brings out measurement of total fixed cost (TFC), total cost (TC), average fixed cost (AFC), and average cost (AC) rather than measurement of average variable cost (AVC) or marginal cost (MC). In this basis, neoclassical average cost means is a form of production price of it. Classical economics define this in just normal capacity usage. (Shaikh 2016, chap 4. P. 151). Bloated cost measurement by profit is separated from real costs. It is marked with star. Marginal cost, average variable cost and average total costs are assumed as U-shaped in neoclassical theorem. Figure 1 shows these curves. Cost sharply decreases till the bottom of the U-shaped curve. And then, it begins to increase from there.

Figure 1
Cost Curves of Neoclassical Theorem



Varian (1993) states that normal price curve, P^* , down to the least point under the output, which is higher than real average cost. This variation is marked in the figure. As price is equal to marginal cost ($P=MC$), short term price is determined on the top point of profit. In the long term, entry factor of new firms is considered that it forces firms in market to move to the bottom point of long term price on the production price curve. It means that marginal cost in long run is equal to production price. So, this means adaptation of rule of the long term price. (as cited in Shaikh, 2016, p.151-152)

Varian (1993) stated that production is determined by production function based on technologically most efficient to produce output. In the standard production model:

$$Y = f(K, L) \quad (3.3)$$

Capital stock and labour are function of output. Hornstein (2002) states that effective use of resource requires usage of all of machines. This is nothing but full capacity utilization. Because, inactive capacity lead to inefficiency. So, firms try to employ worker to increase their production to higher capacity. In other words, this means also that employment decision should cause maximum level of output. This is result of higher capacity production. (as cited in Shaikh, 2016, p. 137-138). In short, firms in neoclassical theory try to maximize profit by making quantity decision to produce.

3.1.2 *Post-Keynesian theorem*²

Post-Keynesian theory of cost, profit and prices has extensive and polyphonic ground, where Godley, Taylor, Eichner, Kregel, Lee, Dutt, Lavoie built on. Lavoie (2006, 44) states that models resemble on the mark-up above cost. Another similarity in models is focusing on capacity utilization. (as cited in Shaikh, 2016, p. 361). Post-Keynesian theory defines profit, which is size of mark-up above average cost. Monopoly power is significant phenomena to determine the size of mark-up. It focuses on oligopolistic type of imperfect

² In this subchapter, Eichner's model is explained that it is presented on the article (Eichner & Kregel, 1975), which is manifestation of Post-Keynesian Theory as a new paradigm. Theory in this subchapter also depends upon Eichner's book, which is "The Megacorp and Oligopoly: Micro Foundations of Macro Dynamics".

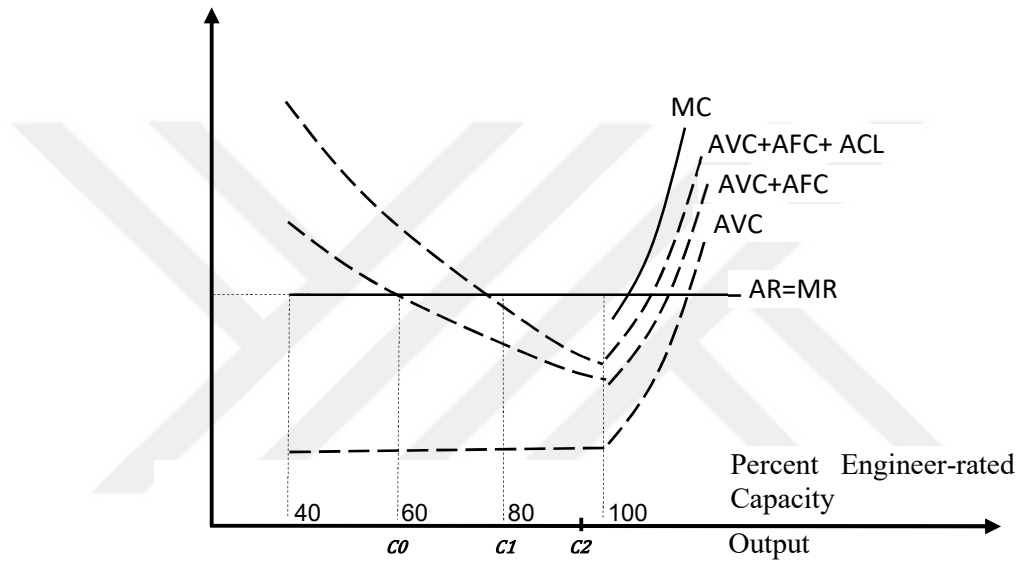
competition, which it means that firms have a monopoly power to push up or down price. So, firms are price maker rather than price taker as in neoclassical approach. Firms can gain extra profit by means of monopoly power that it is more than normal profit. Origin of this idea based upon Kalecki (1968). Theory depends on fixed technical coefficient in short run that firms face constant direct cost to the full capacity. (Davidson 1972, p. 37; Eichner & Kregel 1975, p 1305; Eichner 1976, chap. 2, 28-37). Eichner (1976) assumes that standard operating ratio is 80, which is indicated C_1 in Figure 2. C_0 is 65 percent and C_2 is 95 percent of engineer-rated capacity. According to Eichner (1976, 46), C_0 and C_2 represent range, which megacoprs customarily operate. In this range, marginal revenue and marginal cost are both constant. The rule of short-run maximization of net revenue, which the equivalent of marginal cost and marginal revenue cannot be validated. Firms have always reserve capacity to react demand shocks. So, operating ratio of firms fluctuate around 80 percent of standard operating ratio, Eichner (1976, 57) formulates absolute price level in oligopolistic industry:

$$P = AVC + \frac{FC+CL}{SOR \cdot ERC} \quad (3.4)$$

where P is absolute price level, AVC is average variable costs, FC is fixed cost, CL is corporate levy, SOR is standard operating ratio, and ERC is engineer-rated capacity. Multiplication of SOR and ERC is best way to estimate anticipated rate of output or sales or output. In this construction, industry price leader tries to raise price for internal financing of planned level of investment. It can decline price to expand its market share if it wants. Because, it has lowest average cost among firms in industry. However, empirically behavior of oligopolistic firm's pricing is increasing price as it was shown in Hall & Hitch (1939). Oligopolistic firms can change price. But it has also cost that new pricing decision may trigger cash flow to reduce because of sales drop. According to the Eichner (1976, chap. 3), pricing decision has three constraints. They are substitution effect, entry factor and the possibility of meaningful government intervention, which affect sales to decline in medium and long-run. Figure 2 shows geometric presentation of the model³.

³ It is presented by Eichner (1976, 64).

Figure 2
Cost Curves of Post-Keynesian Theorem



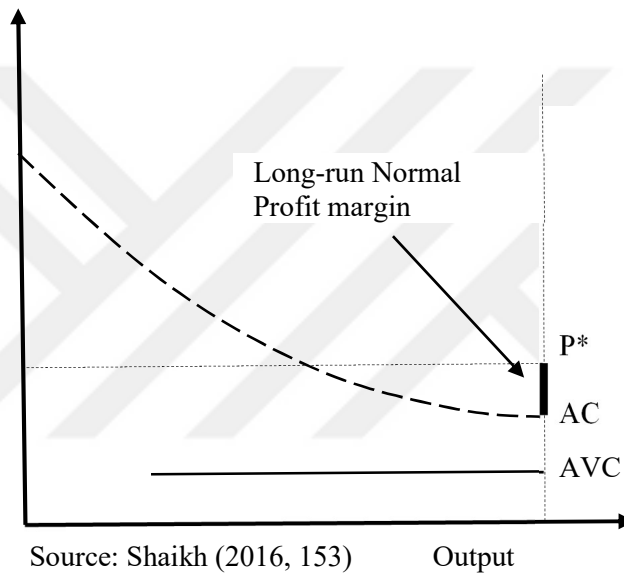
Source: Eichner (1976, 46)

3.1.3 Classical theorem

According to Shaikh (2016, 153), classical approach focuses on long-term competitive price, which consists of normal profit that it is added above average cost, which consists of prime and overhead costs. “Normal” means two important things in here. Firstly, normal profit means the profit, which provides competitive average capital returns. Secondly, normal average cost is cost in bottom point of average cost. It is assumed that bottom point exists when firms operate at the engineer-rated capacity. Figure 3 represents standard cost curve under production with constant coefficient. Shaikh (2016) states that contrary to neoclassical case, normal price, P^* , indicates single price-point, which is equivalent of normal profit per unit of output at the output level corresponding to normal costs. So, marked

gap between normal price (P^*) and average cost (AC) is representing of long-term normal profit margin.

Figure 3
Cost Curves of Classical Theorem



3.2. Competition in economic theory

In classical economics, especially Smith, Ricardo, and Marx, methodology is that it concentrates directly observed real and organic system. Common point of these philosophers is trying to understand the dynamics of the capitalism depending upon what they observe. Through the mid-19th century, a new school of thought took a stage. They began to interest in idealized capitalism rather than real system dynamics. In history of economic thought, they are named neoclassical economists.

In brief, according to Smith, competition is central mechanism, which gravitates market wages, rents, and profits to the normal level. If market parameters exceed or fall the normal level of market, mechanism of demand and supply regulates them through the natural

level (Shaikh 2016, p.330). Moreover, Smith (1973, 151) separates cost and profit. As cost consists of price of raw materials and labour wages, profit is a difference of price and cost. It is completely different from neoclassical thought that profit is component of production cost as I mentioned before. Secondly, Ricardo defines competition almost similar with Smith. Competition equalize wages, profit, and rent. It is a central force, which pulls these into natural level. Ricardo said that market prices cannot stay the level in long term that it is over or under much more than natural level. Ricardo distinguished raw material, labour, cost of depreciation and profit. Main contribution of Ricardo on competition theory is separation of average and regulating condition of productions in his analysis of rent, which is a specific payment of portion from the production in that land to landlords in order to use indestructible and original power of earth. (Ricardo 1951, 67). Shaikh (2016, 333) emphasizes Ricardian assumption that incremental share of rent in total surplus leads to decline profit share.

According to Marx (1967, 95), firms determine their own prices. They continuously try to decrease prices in order to compete with each other. Intention of capital is gain more profit in accumulation process. This is expansive process, which creates conflict among industries. These frictions are naturally antagonistic and competition is a war that firms fight each other (356). So, firms try to expand their market share in order to obtain more amount of profit. This means displacing of rivals (Marx 1968, 484). Shaikh (2016, 333) states that price cutting bases on cost reduction. So, firms always try to decline costs. Furthermore, Marx defines cost as raw materials, costs of labour and depreciation of fixed capital. Profit and interest rate are not components of cost of production (Marx 1967 chap. 8). In capitalist mode of production, capitalists do not have guarantee, which gains profit. In fact, loss is common and small businesses are destroyed because of competition (626). Marx extended application of Ricardian differential rent into the production as a differential profitability in all industries. His emphasis on continual technical change means existence of persistent difference among individual labour value and unit costs within every given industry (Shaikh 2016, 336). Therefore, in the firm base, distinction between average and regulating capital comes into the picture. This is Marx's contribution to classical economics. In the rent analysis of Marx, regulating conditions are prominence. Marx (1967b, chapter 10) exemplifies it by

comparing with factories, which derive their energies from stream engines and natural waterfalls (as cited in Shaikh, 2016, 337). He tries to analyze competition among industries by depending upon differential production conditions. So, regulating capital is central role in his analysis of competition.

3.2.1 *An antagonistic controversy*

Smith, Ricardo, and Marx interested in dynamics of real system. So, their theories built on competition as a general organizational characteristic of capitalism that is the idea, which directly observed in market. Through the mid-19th century, a new school of thought was developed as we know Neoclassical economics today. This school of thought stopped to struggle understanding of real dynamics of capitalism. They began to idealize it. And then, they tried to understand real and organic world by looking idealized and unrealistic worlds. This idealization spread theory of firm and especially competition. Firms turned into passive firms, which is price taker and quantity adjuster that firms face horizontal demand curve. (Cournot, 1838). Jevons (1871) developed the Cournot's idea of unlimited competition. Perfect competition was based on full market information of producers and consumers. And, Edgeworth (1881) defined all conditions of perfect competitions. These theoretical development process reached peak point with Leon Walras (1874, 1877). Walrasian theory is still at the center of micro and macro theories of neoclassical economics. Walras' studies did not know in the countries where people spoke English. Elements of Pure Economics was translated into English at 1954. In England, Marshall responded Cournot's call of mathematization of economics. He started with theory of exchange just like Cournot, Jevons, and Walras. Initially, Marshall's thought on competition was similar to classicals. He rejected perfect competition. In his book, is Principles of Economics, firms face downward sloping curve of demand rather than horizontal demand curve. But he shifted the ideas of horizontal demand curve and price taker assumption of firm after third edition of book (Shaikh 2016, 343). Crucial thing in here is that downward sloping curve of demand means that firms are sensitive to the demand. This is nothing but violation of assumption of full information in the theory of competition. Assumptions of identical firms and homogeneous production provide the idea, which individual firm cannot significantly affect market prices in perfect

competition. This belief means existing of horizontal demand curve. So, full information provides correctness of this sense. Shaikh (2016, 347) refuses the story and emphasizes discrepancy is that a little information is sufficient to notice identity of whole firms if firms are homogeneous. So that, every individual firm knows that other firms react immediately at the same time and at the same volume when it responses signal of market. That is, if it increases its production, it knows that market price will fall because others do what it did same thing. This means that every individual firm knows existing of downward sloping demand curve in the conditions of perfect competition. So, assumption of horizontal demand curve for firms is not proper in this base. Therefore, perfect competition is endogenously inconsistent. Because it requires irrational expectation of firms. On the contrary, if coherent expectation of firm is assumed, theory of perfect competition will collapse. So, forsaking sense of demand conditions and horizontal demand curve is one of the ad hoc assumptions to survive theory of perfect competition.

Shaikh (2016, 343) explains centrality of Walras at neoclassical economics. First one is idealization of competition and capitalism, which is ground of whole theory. Second one is that a phenomenon can be explained only in economics by referring previous choice of individual acts that it means methodological individualism and economic subjectivism. Third one is generalization of the ideas, which are diminishing return and principle of scarcity within all factors of production. Fourth one is redefinition of cost term, consists normal profit and thus convert equality between cost and market prices in equilibrium into equality between market prices and production prices in general equilibrium. Fifth one is concept of dynamic equilibrium that it takes place itself automatically whenever it is disturbed. Sixth one is an assumption that economic activities can be realized only in the equilibrium point. Because, agents have to commit only in equilibrium point. Seventh one is consequence that full employment always exists because actual employment only realizes in equilibrium point. Last one is that all agents are price takers. It is maybe most important requirement, which is essence of Walrasian equilibrium model. Prices are always given, so that individual agents decide only to quantity. Price taking behavior is one of the most important requirements for marginalist foundation of theory. It provides derivation of individual demand and supply

functions, marginal utility, marginal rate of substitution, marginal rate of transformation. That is, passive price taking behavior is a requirement for marginalism.

In the beginning of first quarter of 20th century, first punch was given on the foundation of neoclassical economics. Sraffa (1926, 539-541) showed that diminishing return or increasing cost cannot be existed in long run. On the other hand, increasing return or infinitely diminishing cost is not compatible with neoclassical equilibrium. So, fixed cost, means equality of marginal cost and average cost, is only consistent condition of production in the long run. Anticipated demand curve in long run passes through the minimum point of average cost curve. And, demand curve p has to move along with average cost and the marginal cost curve as a result of latter, is flat. That is, through the marginal cost, $p=mc$. It means that $p=mc$ condition of profit maximization is consistent for all type of production scale: production scale cannot be determined (as cited in Shaikh, 2016, 358). This is also one of the crucial fragments of classical theory of competition. This paper showed that limit of production does not exist in cost of production because production realizes in the condition of increasing return or diminishing cost. As a result of downward sloping curve of demand for individual firm, price cutting behavior can be inferred in here because firms must continuously diminish cost of production in order to sell more. Therefore, Sraffa opened a door, which gets out of perfect competition to monopoly. This result was very pleased by economists of Cambridge. Lots of economists were initiated to construct the alternative theory of competition. Chamberlin (1933) published a book, is called "Theory of Monopolistic Competition". Robinson (1969) and Chamberlin (1933) focused on monopolistic competition as Kalecki (1933) and Sweezy (1939) tended to analyze degree of monopoly. Studies of Hall & Hitch (1939), Sitgler (1947), Markham (1951), Bain (1949; 1956), Fellner (1951), Labini (1969), Eichner (1973; 1975; 1976) established a wide range of alternative theory of competition. These long-lasting conversations contributed to foundation of post Keynesian economics. These economists aimed to establish a new theory of competition, which reflects what happened in reality. They intend to capture reality and its dynamics. So that, theory of imperfect competition was derived from theory of perfect competition. It intended to reshape misrepresentation of perfect competition in order to

establish real theory, which has ability to explain reality. For that purpose, respectively; price taker assumption was converted into price setting, assumptions of homogeneous production and identical firms were turned into heterogeneous production and firms so that firms face demand inelasticity in short run, infinitely small firms and perfectly competitive market were replaced by mega corporations and oligopoly. As markup pricing that firms added a markup above average cost, is general consensus, size of markup is determined by degree of monopoly.

Antagonism between theories of perfect and imperfect competition has continued today.

3.2.2 Real competition

Modern classical approach emphasizes competition, which drives economy by equalizing profit rates among industries. In this point, the concept of regulating capital becomes importance. It is a different from standard understanding of capital. In the standard textbook, capital is homogeneous. But, in here, there are average capital, is inclusion of newer and older capitals, and regulating capital, is consisting of newest capital. So, returns of these capitals are different. According to Shaikh (2016, 298-300), the profit rate of total capital is the ratio of total profits to the current cost value of the capital stock. Numerator and denominator are in the terms of current dollar. So, it is real rate of return.

$$r_t = \frac{P_t}{K_t} \text{ [Average rate of profit]} \quad (3.5)$$

Real rate of return includes different types of capitals in overall stock such as newer and older capitals. Newer capital is nothing but marginal efficiency of capital (Keynes 2018, chap. 11). Let us rearrange (3.5):

$$r_{I_t} = \frac{P_{I_t}}{K_{I_t}} \text{ [Rate of profit on new capital]} \quad (3.6)$$

So, Keynesian “marginal efficiency of capital or current rate of return on recent investment capital (r_{I_t}), is equal to the profit of most recent investment capital, divided by,

cost of newer capital in terms of current dollar. At a moment of time, current profit, P_t , of firm is combination of current profit of most recent investment capital and current profit on all the other former capitals.

$$P_t = P_{I_t} + P'_{K_t} \quad (3.7)$$

In the equation, (3.7), units are in term of current value. Using P_t , current period of profit and P_{t-1} , previous period of profit, $P_{t-1} \left(\frac{p_t}{p_{t-1}} \right)$ can be transformed of last period profit into current value. So, we can rearrange the equation (3.7) to clarify the profit on new capital. It is sum of increment of total profits in terms of current value and adjustment term, which includes the effect of change of factors such as capacity utilization, scale, price, wage, efficiency etc:

$$P_{I_t} = \left(P_t - \left(\frac{p_t}{p_{t-1}} \right) P_{t-1} \right) + \left(\left(\frac{p_t}{p_{t-1}} \right) P_{t-1} - P'_{K_t} \right) \quad (3.8)$$

If we use this transformation into current cost value of new capital, which contains investment flow, I_{t-1} , of past period, we can obtain:

$$K_{I_t} = \left(\frac{p_t}{p_{t-1}} \right) I_{t-1} \quad (3.9)$$

Therefore, using equations (3.8 and 3.9), the profit rate of new capital is

$$\begin{aligned} r_{I_t} &= \frac{P_{I_t}}{K_{I_t}} = \frac{\left(P_t - \left(\frac{p_t}{p_{t-1}} \right) P_{t-1} \right) + \left(\left(\frac{p_t}{p_{t-1}} \right) P_{t-1} - P'_{K_t} \right)}{\left(\frac{p_t}{p_{t-1}} \right) I_{t-1}} \\ &= \frac{\left(\frac{P_t - P_{t-1}}{p_t} \right)}{\left(\frac{I_{t-1}}{p_{t-1}} \right)} + \frac{\left(\frac{P_{t-1} - P'_{K_t}}{p_{t-1}} \right)}{\left(\frac{I_{t-1}}{p_{t-1}} \right)} \end{aligned}$$

$$= \frac{\Delta PR_t}{IR_{t-1}} + \frac{PR_{t-1} \left(1 - \frac{PR'_{K_t}}{PR_{t-1}} \right)}{IR_{t-1}} \quad (3.10)$$

where $PR_t \equiv P_t/p_t$ = real profits and $IR_{t-1} \equiv I_{t-1}/p_{t-1}$ =lagged real investment. Calculating current profit of new capital can be reduced to division of real profit of older capital stock to real profit of this same set of capital stock in the previous period, $\left(\frac{PR'_{K_t}}{PR_{t-1}} \right)$ (319). Let $YR_t, wr_t, t_t, L_t, yr_t = YR_t/L_t$ represents respectively real output, real wage, indirect business tax rate, employment and productivity. And, variables, belongs to older capital in terms of current period are denoted by YR'_t, L'_t , and so on. They are also denoted by YR'_{nt}, L'_{nt} , corresponding to economic capacity, where is the point, is desired by competitive market in long-run (Kurz 1986). Lastly, let $u_t = YR_t/YR_{nt}$ indicates rate of capacity utilization. Therefore, we can rewrite equation (3.10) as relative profit of older capital four different term, which is product of four different terms.

$$\frac{PR'_{K_t}}{PR_{t-1}} = \frac{YR'_{K_t}(1-t_t)-wr'_t L'_t}{YR_{t-1}(1-t_{t-1})-wr_{t-1} L_{t-1}} = \overbrace{\left(\frac{u'_t}{u_{t-1}} \right)}^{\pm} \overbrace{\left(\frac{YR'_{nt}}{YR_{nt-1}} \right)}^{-} \overbrace{\left(\frac{mr'_t}{mr_{t-1}} \right)}^{\pm} \quad (3.11)$$

$mr'_t = \left(1 - t_t - \frac{wr'_t}{yr'_t} \right)$ is the real profit margin of older capital in terms of current year.

$mr_{t-1} = \left(1 - t_{t-1} - \frac{wr_t}{yr_t} \right)$ is real profit margin of older capital in terms of previous year.

So, first term of equation, (3.11), is the ratio of current and previous year's capacity utilization for older capitals. So, u_t/u_{t-1} represents gross rate of change of capacity utilization if capacity utilization of this year and previous years are almost same. Second term is ratio of current real capacity of older capital to their own real capacity in previous year. And last term shows ratio of real profit margin. So, these terms are likely to be close to 1. And formulation of profit rate of new investment in equation (3.10) reduces to the ratio of

changing real profit to the real investment of last period or “real incremental profit rate”. So, we can obtain this equation:

$$r_{I_t} \approx \frac{\Delta PR_t}{IR_{t-1}} \approx \frac{\Delta GOSR_t}{IGR_{t-1}} \quad (3.12)$$

[Current profit rate of new capital $\approx$ real incremental profit rate]

In order to avoid difficulty of calculation, Shaikh uses gross operating surplus (GOSR) and gross real investment (IGR), which are directly observed in database. This can be easily interpreted as marginal return of capital. Shaikh (2016, 303) investigates the distinction of average and incremental rates of profit on the world scale. In the appendix, Figure 15 on the top demonstrates average rates of profit on total capital in the manufacturing industries of world from 1970 to 1990. Data is smoothed three year centered moving averages. Some lines are clustered and motion of industries is stable. They move persistently above or below. There is not significant fluctuation among firms. This can be directly interpreted by schools of Post-Keynesian and Marxian Monopoly Capital as it is result of monopoly power among industries. However, in the classical construction as I examine, distinction between overall and regulating capitals shows that reality is now what it seems in the figure on the bottom. Figure on the bottom displays three year moving average of incremental rates of profit for corresponding industries. Dynamic fluctuation process of profit equalization is clearly seemed. These fluctuating patterns support to classical theory of equalization of profit rate.⁴

Another important notion of modern classical approach is price formation. As in theory of imperfect competition, firms are setting price rather than price taking. For instance, post Keynesian theory focus on price setting behavior that firms set price depending upon degree of monopoly in order to fund their investment. In this way, investment demand function is derived. Firms can increase price in short-run. Intention of price setting is obtaining more profit or fund for planned investment. However, the modern classical

⁴ For details, look at Shaikh (2016, 301-305)

explanation about price setting is different. In fact, competition is a war in which firms fight with each other. So, distinction is that firms exhibit price cutting behavior in modern classical approach (Shaikh 2016, 366). Although firms set price, they try to cut price in order to expand market share. Cutting prices mean to destroy rivals by getting market share of them. In short run, firms' profit rate can reduce as a result of price cutting. But, expanding market share and failing rival cause to increase profit in long run. It means also surviving in the war. Cutting prices is strictly about cost. So, each industry has lowest cost leader, which can decrease price and sells at prices, which rivals will not able to sell at this price point. So, firms should perpetually reduce cost in order to cut prices. Choice of technique trigger cost and then prices to down. Technical development or cost reduction and price cutting behavior are important factors in process of profit equalization. In the classical theory, there are two fundamental prices; production price and market prices. Production price is consisting of production conditions as cost and technique. It is gravitational field, which pulls market prices to the normal level. Because, market prices fluctuate continuously to up and down around production price. Profit equalization process is reflection of pricing dynamics of the competitive firms.

Lastly, as we entered a bit before, competition cannot be understood by looking concentration or number of firms in an industry. There can be mercilessly competition even if market structure is oligopolistic or monopolistic. So, this point is other issue, which distinguishes modern classical approach from theories of imperfect competition as in post Keynesian theory. Modern classical theory investigates competition on market share in the historical and dynamics process (367-379).

4. MODERN THEORIES OF MONEY

In order to understand demand dynamics of the system, creation and circulation of money has to be understood. Because, money is a purchasing power in which credit is dominant form of money in the modern fiat money system. Hence, comprehension of credit

creation and circulation becomes important. And, role of economic agents in the process of money creation and circulation has to be also understood.

In the standard economic textbooks, three mainstream theories or mixture of them are covered. These are Monetarist, New Keynesian and New Consensus theories of money. Mainstream economics define money as an exogenous phenomenon controlled and pumped into economy by central bank through the monetary policy. Monetarism was developed by Milton Friedman and his followers. It focuses on money supply, which is primarily and main driver of economic growth. On the other hand, New Keynesians follow monetarism by enlarging it via credit channel. They take into account asset management of commercial banks. New consensus view is classified in new Keynesian framework. It was developed by John Taylor. He derived a policy rule for central bank within the short-run and long-run. Demand factors are considered in the short-run. And, role of central bank in the money market is reinstalled. On the contrary, monetary theories of post Keynesian economics has been located into demand side of money. Money is an endogenous phenomenon, which is widely agreed in the post-Keynesian framework.

4.1 Monetary theories of mainstream economics

Standard monetary theory has been constructed upon the idea, which central banks are dominant in the process of money creation; so that they have entire control on money supply. This idea requires some of other assumptions. First of all, banks are passive in this consideration. That is, they have ability to create loans if central banks allow them through providing new monetary reserves. This is nothing but the idea of money multiplier, which means that central banks control the money supply over it. So, central banks can set monetary reserves just as they setting reserve price by setting interest rate. We will discuss later how impossible to set both of them. Now, we go into more details.

The mainstream monetary theory is evolved from the views of monetarist and new Keynesian approaches. Friedman (1968) and Brunner (1968) states that any exogenous increase in monetary aggregates (MA) may expand GDP in only short term. However, in the

long term, it will cause inflation ($MA \rightarrow GDP$ and MA is not equal to real GDP). Therefore, money supply should be under control and increased with respect to potential economic growth. This story defines money as an exogenous phenomenon. It is created by monetary base (MB). So, direction of causality is from monetary base (MB) to monetary aggregate (MA). In this consideration, banks credit (BC) expansion must be realized under the growth of monetary aggregate via money multiplier process ($MB \rightarrow BC \rightarrow MA$) (Panagopoulos & Spiliotis, 2008). So, monetarist approach enlarges absolute power of central bank within financial institutions, and thus of the money creation. On the other hand, credit channels have been revived by New Keynesians within the orthodox economics. De long (2000) states that New Keynesians injected the idea of credit channels into orthodox monetary theory. Gordon (1990) emphasizes that they focus on asset management of commercial banks. However, New Keynesians underline loan supply rather than loan demand ($BC^{supply\ driven} \rightarrow GDP$), which put forwarded by Post Keynesians (as cited in Panagopoulos & Spiliotis, 2008). According to New Keynesians credit money is supply driven. It means that New Keynesians accepts money multiplier process; so that, direction of causality from monetary base to monetary aggregate ($MB \rightarrow BC$ and so $MB \rightarrow MA$). In short, New Keynesian approach contributes just idea of loan supply to orthodox view as different from monetarist view.

In the 90s, Taylor (1993) developed initially the new consensus view. Clarida et al. (1999) states that it is classified into New Keynesian framework. According to the Fontana and Palacio-Vera (2003), this view emphasizes that money stock variables are unable to capture causal relation with output; so that, quantity issue is not centrality anymore within new consensus view (as cited in Panagopoulos & Spiliotis, 2008). So, crucial point of New consensus is that quantity theory of money was rejected (Fontana, 2006). Taylor interest rate rule aims to repair the prestige of central bank by reinstalling on the centrality of money channels. Panagopoulos & Spiliotis (2008) explains that the idea beneath three equation system of new consensus view is that economy, within the short run, diverges from its Wicksellian natural level. Therefore, if central bank follows Taylor policy role by intervening money market depending upon its centrality and administrative role in the money channels, economy will converge through the equilibrium in long run. In sum, aggregate demand

factors manipulate economy by pushing it through out of the equilibrium in short-run. This is nothing but loan demand idea of New Keynesian approach. If demand factors cause inflation, which demand-pull inflation emerges, central bank takes position by manipulating interest rate in order to stabilize economy within the long run. So, as cited in Panagopoulos & Spiliotis (2008), Rochon's argument that money multiplier and reserve constraint for money channels are held within New Keynesians (moderates or new consensus) is agreed in the literature in spite of not clearly remarked by new Keynesians (MIER $\rightarrow$ BC).

4.2 Monetary theories of heterodox economics

Theoretical spectrum of heterodox monetary economics is wide and substantially various. In the essence of heterodox position is aiming to understand form of money in modern days; so that creation and circulation of this form are becoming more important. So, fiat money system is the modern system of money. And, credit money is main part of fiat money that it is equivalent to more, average for economies, than 92 percent of money in the system. Therefore, first focal point in heterodox theories of money is credit.

In the heterodox monetary literature, there are some theories, which synthesize orthodoxy with a mind, which does not have purpose of understanding fiat money form and its dynamics, but somehow these theories are called Heterodox. They are out of this chapter. In the heterodox side, there are three main monetary theories; I. Horizontalism, II. Structuralism, and III. Circuitism. First issue that importance of credit money and its endogenously creation is widely accepted and agreed within these theories. Therefore, the idea that central bank determines and controls money supply exogenously is refused. Second one is that loans make deposits that demand factors is crucial point, which its importance is comprehended among these three theories. So, market forces control endogenously money supply.

Horizontalism and Structuralism are interrelated with a conversation on money supply curve. They have of course different focal points. On the other hand, Circuitism takes

a stage from different ladder. Its main focal point is circulation of money within the system rather than how it is created.

4.2.1 *Horizontalism*

In the theory of horizontalism, which is also called accommodationism”, first of all, it is accepted that purpose of banks is selling credit. One of the most underlying issue is that loans create deposits rather than orthodox theory in which deposits create loans. According to the Moore (1988), bank credit is derived by business firms. Companies borrow credit from banks in order to fund their working capital. Companies need credit because they have to pay factors of production such as labour wages, raw materials and office expenditures (Moore, 1983). So, loans are demand-determined. According to the Moore (1988), the idea of quantity theory of money that banks cannot make loans without sufficient reserves is not true. In his notion, existence reason of the central bank is last resort; so that, central banks must provide reserves whenever commercial banks meet. Hence, it has to fulfill deficiency of reserves in the system via nonborrowed reserves. This is called fully accommodative central bank. Moore (1998) do not refuse also that Central banks may use option of open market operation. However, current bank lending and deposit creation affect next period required reserves of banks. That is, banks selling credit and then look for reserves (Lavoie, 1984). So, attempting of central bank, which obtains nonborrowed reserves of banks by selling bonds, causes in opposite direction identical effect in borrowed and excess reserves, which are free reserves. Hence, this attempt causes rising discount rate (Palley, 1996, 592). This is what none of central banks want because this kind of liquidity ejections suffers market forces and so increase risk of financial panic (Lavoie, 1996). And also, according to the horizontalist view, using open market operation of central bank may mean that it delayed to accommodate. Therefore, it has extra cost for economy. In the regime of flexible exchange rate and free capital flows, banks can even obtain reserve from foreign supplier at a supply price set by foreign central bank (Moore 1988, 383). Some banks may have excess supply of reserve. Commercial banks may also obtain reserve with each other. In sum, banks expand total amount of money in the system by making loans derived by demand factors. Therefore, central bank accommodates this expansion. Theory of endogenous money sometimes is

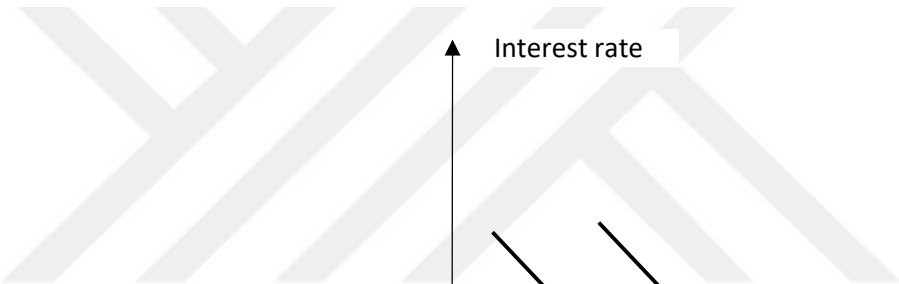
interpreted as applying that central banks are passive and have no ability to control money supply growth. This is obviously misunderstood. According to the Moore, an endogenous theory of money supply denotes that money supply is demand-determined and central bank sets the level of short-term interest rate exogenously (384).

According to the Moore (1988), loans and deposits are significantly correlated with each other. They move together and they are created at the same time in the balance sheet. How? When credit demand of a firm or household is approved, bank official opens a new account to borrowers. Hence, credit is written to borrower as a liability. It is also written to bank's balance sheet as an asset at the same time. Banks are quantity taker and price setter in both of their loan and deposit markets (Moore, 1988, 381-382). So, there is no need for additional interest rate as a result of increase in bank lending. Because, banks create money without sufficient reserves; so that money supply curve is horizontal within the short term. So, there is no need that credit supply curve should be upward sloping (382). This means, by the way, that horizontalists refuse components of money multiplier (Panagopoulos & Spiliotis, 2008). Pollin's test supports to idea that central banks cannot set both price and quantity of reserves (Moore, 1991; Pollin 1991). Short term interest rate is exogenously determined by central bank. And central banks cannot determine long-term interest rate. It is depending upon future expectations. So, market forces have substantial role to derive long term interest rate (Moore, 1991, 411-412).

Palley (1994, 1996) illustrates Moore's model in graphically. Figure 4 represents this graphical presentation of Horizontalist model. Upper right panel shows credit market in which credit demand, C^D , is negative function of discount rate or loan interest rate. Credit supply, C^S , is perfectly elastic and horizontal at the discount rate, i^* , which embodies markup above federal funds rate, i_0 , is exogenously determined by central bank. Intersection of credit demand and supply, is point A, reflects total quantity of credit money. The lower right panel demonstrates balance sheet of banking sector. There is a linearly relation between credit and deposits. Deposits are created whenever banks loan because banks create loan even if they don't have sufficient reserve because they look for reserves in the next period. This means

The diagram illustrates the effect of an increase in the interest rate on the IS-LM model. The vertical axis is labeled "Interest rate" and the horizontal axis is labeled "Output". The IS curve is downward sloping, and the LM curve is upward sloping. An arrow points from the initial equilibrium point to a new equilibrium point, indicating a decrease in output.

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Horizontalism. Important point in here is that monetary authority sets federal funds rate exogenously and accommodates monetary expansion of banks. That is, central bank is price setters but not quantity setter. This reflects, by the way, the well-known claim of post-Keynesian against mainstream monetarists that central bank cannot hold both price and quantity.

4.2.2 *Structuralism*

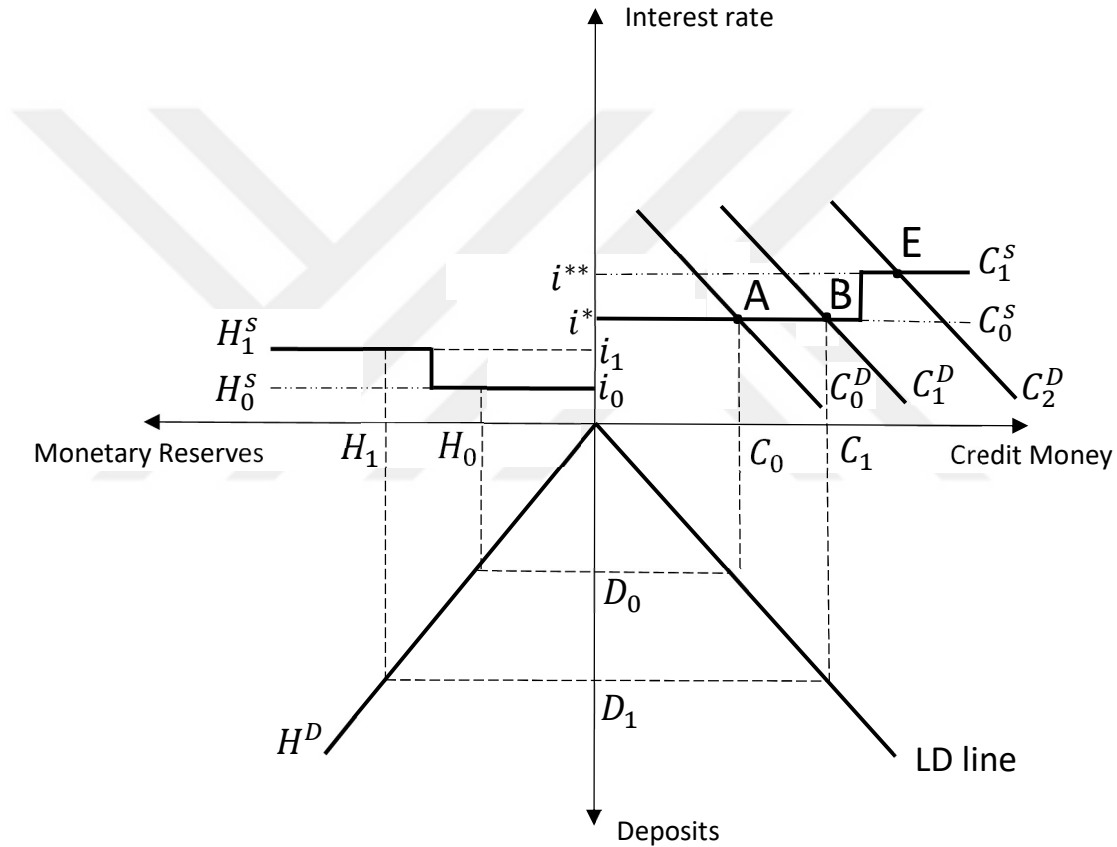
Structuralists in the literature are located as oppose to horizontalists. First of all, they have same idea about money endogeneity with horizontalists. They agree that working capital of firms drives credit money supply, hence they accept that demand driving mechanism that loan creates deposits. However, Structuralists raise objections to horizontalist portrait of loanable funds theory (Fontana, 2003). First disagreement is that they oppose to idea that central bank takes fully accommodative position when banks demand reserves. Palley (1996, 592-593) points out that central bank may not only set interest rate but it may conduct quantity based policy in sense of structuralism because slope of credit supply is importantly affected by central banks' policy. So, partial accommodation is more relevant. For this reason, they defend less perfectly elastic supply (Fontana 2003, 302). So, credit supply function is positively slope (Palley, 1991, 398). Structuralist idea in which central banks may conduct reserve based policy is somewhat understood that Structuralists accept some component of money multiplier. Second disagreement is that Structuralists charge Kaldor and modern horizontalists with their insufficient consideration about liquidity preference theory. They consider that liquidity preference theory should be central for endogenous money (Fontana, 2003, 297). Wray (1990, 1992, 1995) puts forward this point (as in cited by Fontana 2003, 301). Behavioral functions of households, firms, banks, and central banks are included in the scope of liquidity preference. Theory of liquidity preference expands endogenous money by taking into account interaction of agents. Liquidity preference of agents affect money supply process (298-300).

Depending upon graphical presentations of Palley (1994, 1996) and Fontana (2003) structuralist model is represented in Figure 5. Upper right panel shows credit market. Credit

supply, C^S , is determined by level of discount rate, i^* , which is markup above federal funds rate, i_0 , is set by central bank. It is gradual structure because of expected reserve based policy of central bank. Credit demand, C^D , is negative function of discount rate or loan interest rate, i^* . Interaction of credit demand and supply, is denoted by A, gives us total quantity of credit money, C_0 . Lower right panel shows balance sheet of banking sector. LD line denotes loan demand line. There is a linear relationship between credit or loan and deposit. This reflects that loans create deposit. So, the level of deposit, D_0 , is associated with total quantity of credit money at the level of C_0 . Then, lower left panel demonstrates link between demand deposits and demand for monetary reserves. This linear relationship is denoted by H^D . So, H_0 is the level of monetary reserve associated with level of demand for deposits, D_0 . Finally, upper left panel represents federal funds market. Monetary reserves supply or central bank's reaction function is also gradual structure at varying federal funds rates, i^*, i^{**} . So, there are two monetary stances in here.

Therefore, in this figure, if credit demand rises, ($C_1 > C_0$), at the level of discount rate, i^* , this causes that credits increase level of deposit, ($D_1 > D_0$). Then, banks look for reserves after deposits are created. According to the structuralists, central bank may conduct reserve-based policy in which it follows partially to accommodate rather than fully accommodate (Palley, 1991, 1994, 1996; Fontana, 2003). So, central bank raises federal funds rate from i_0 to i_1 that it means contractionary policy, which is new stance. It raises supply of monetary reserves, H_1^S . Then, H_1 is the new level of monetary reserves associated with level of deposits, D_1 . In the next period, new federal funds rate, i_1 , pushes discount rate up from i^* to i^{**} because banks are business of selling credit in which they adjust discount rate by adding markup to federal funds rate. So, difference between i^{**} and i_1 is the new level of profit margin for banking sector. According to the sense of structuralists, credit supply is affected by new stance of central bank because of rising discount rate. If credit demand increases from C_1^D to C_2^D , E is the new interaction point between credit demand and supply at the new level of discount rate denoted by i^{**} . In the following periods, both reserve supply, H^S , and credit supply, C^S are derived as positively slope. In a way that central bank conducts reserve-based policy, it can control both quantity and price according to the structuralists.

Figure 5
Determination of credit rate, credit-money, deposits,
and the monetary base in the structuralist model



4.2.3 Circuitism

Circuitism has a different source than both Horizontalism and Structuralism. Circuitism originated in Italian-French economists whose homeland is continental Europe. They have been kept intact by virtue of British monetary development. Circuitism has been fed and enriched by the especially Keynes' treatise, his post General theory articles, Kalecki, Wicksell, Schumpeter and Marx. Prominent economists of this Circuitism are Alain Parguez,

Augusto Graziani, Bernard Schmitt, Michel Aglietta, Louis-Philippe Rochon, Mario Seccareccia, Sergio Rossi, Marc Lavoie.

Horizontalism and Structuralism are conflicted with emerging point of money. They do not agree on how money enter the system and where is the source of it. According to Marc Lavoie (1984, 778), money is an endogenous phenomenon in spite of central bank's stance whether it is dynamic or not. Moreover, Lavoie (1996b, 553) makes clear that degrees of accommodation, liability, and financial innovation whether they are lack or not, are not primarily phenomena to comprehend crucial causalities within the circulation process that begins with credit or debt and ends up with payment of debt (as cited in Rochon, 1999, 3). Circuitists have taken into account the money from starting point to its destruction. In the circulation process, Graziani (2003, 25-26) formulates the economy including four main agents, are central bank, banks, firms and wage-earners. He remarks that money enters into market via bank credit and its role makes possible commodities' circulation (16). He explains briefly monetary circuit as following propositions. First of all, money is a form of credit in modern economies. Credit form is presented by bank credit. Second is that credit money is produced by bank whenever an agent decides to spend money. It is granted by bank. And, money is destroyed whenever an agent repays; so that bank credit is debt at the same time. Third one is that money is created endogenously and it is introduced into market as a result of negotiation between banks and firms⁵. Fourth one that society is consisting of producers and wage earners. Producers access banks to get credit, which is not constraint by the level of income or wealth. They need purchasing power of money in order to carry out production. On the other hand, wage earners spend money, which already earned income. Fifth one is that purchasing power is not granted on the same footing by banks. It seems obviously that firms have great ability to access bank credit. Therefore, money cannot be neutral. Six is that money circulates within the system. It begins with a moment, which bank grants credit to

⁵ Rochon (1999, 5) states one of the main difference between circuitists and post-Keynesians. Circuitists focus on interaction between firms and banks whereas post-Keynesians make more effort to understand the relationship between money, contract and uncertainty (Davinson 1972). And one more important point is that fundamental role of banks which are firms, is active profit seeker and compete with each other. Graziani (1990, 9) emphasises that post-Keynesians still ignore this issue (as cited in Rochon, 1999, 10)

firm. And then, it goes back to bank for the purpose of repayment, which is destruction of money granted before. Its movement within the system is described as a circuit. Last one is that macroeconomic analysis clarifies how money creation affects production, which is consisting of consumption and investment goods. Monetary circuit theory explains also distribution of income between wages and profits. It shows that role of money and its accessibility to a social group give us very important information at the social and economic levels.

Monetary circuit starts with bank's decision to grant credit to firms. Commercial banks do not need to have preexistence of liquidity while they are creating credit for firms. So, loans make deposit (82-83). Accordingly, in the circuit theory, firms are only agent to access to bank credit. Firms have to pay wage bill to wage-earners; so that bank credit is demanded when firm decides to hire workers in order to produce. As Eichner (1979) and Lavoie (1984, 779) argue that production must be carried out by emission of loan. Firms need loans because they have to hire worker and buy raw materials and capital goods (Saccereccia, 1996). So, amount of granted credit and interest rate may affect by negotiation between firms and banks (27). Important point in here is that banks cannot response whole credit demand of firms. They take into account several factors such as economic stability and future expectations of the industry, financial status of firm, its past relations with banks, firm's total market worth, capitalization, debt and cash flow, and most importantly potential profitability of the firm. These are determinations of credit worthiness of firm. Bank may tighten or loosen these requirements for loan (Rochon, 1999, 10-11). Circulation starts with granted credit by bank. Then firms decide to level of output and employment by hiring wage-earners. Wage-earners can only decide to distribute their earnings between consumption and purchase of firms' securities or saving as a bank deposit. So, wage-earners spend their money income in the commodity market or buy firms securities in the financial market. Then, firms take back the money, which was paid before. They can use these sales income in order to pay their debt. This means nothing but destruction of money that monetary circuit is closed. So, new production cycle will begin with new credit money that bank decides to grant to firm. However, if wage-earners decide to save some portion of their money income as a bank

deposit, money does not flow back to the firms. Therefore, firm's debt increases as much as wage earners save. Credit money granted by bank cannot be destroyed entirely. So, monetary circuit is closed with losses. This causes to deteriorate creditworthiness of firm (Graziani, 2003, 29-30). And, it is clear that production is a process of debt formation (Rochon, 1999, 9). This description can be expanded by introducing government sector as a fifth agent. Omitted point above description is problem of interest payment to the banks. Firms cannot pay total amount of interest payment because they can only pay the money, which flows back to them. Even if wage earners spend all of their money income in the commodity market, firm can only pay the money, which is equal to initial money granted by bank. Interest payment may be obtained by bank as a form of firm's equities. And, government deficit may be another solution for interest payment, but this creates problem of government debt payment which also has to be paid back (31).

In the monetary circuit, central bank as an agent is located, into the monetary circuit theory, to perform at least two main roles. Firstly, it has to be sure of constraints of that commercial banks follow their constraints. Secondly, central bank has a defensive role to prevent liquidity crisis within the system. It monitors monetary cycles and interfere with rapid credit expanding (63).

This theory is not only about creation of money. As description above makes clear, it is also theory of accumulation and distribution. As Lavoie (1992, 159) states that retained earnings of firms are falling if wage earners decide to save more. Hoarded money that wage-earners decide to save some portion of their money income means drain on firm's profit (Rochon, 1999, 13). This creates debt as banks grant firms' new credits in order to refund their debts.

4.3 Augmented version of endogenous money theory

Graziani's basic model builds on triangular base, which consists of banks, firms and wage earners. He explains relation among agents. His model seems to accept horizontalist notion of money. In my view, especially function of central bank is not explained well

enough. Let me begin with role of central bank in the augmented version of monetary theory of production, as we see in the Figure 6, Central bank links to banks in the system. Clearing and Settlement process of banks and other financial institutions is conducted by central banks. It can be different among countries or regions. It is more comprehensive if I exemplify the process.

In the Eurozone, payment system is Target2 created by Banque de France, Deutsche Bundesbank and Banca d'Italia. It is real time gross settlement system and all of transactions are settled by central bank. All banks must to have account in the central bank. And their transaction is settled with central bank money. For instance, when an Italian person purchases a bag from French web store, payment process starts with her bank account in a commercial bank – i.e., the Modiolbanca of Italia. Modiolbanca has a bank account in Banca d'Italia, which is central bank of Italia. By reducing her deposit, her payment moves digitally from Modiolbanca, she works with, to Banca d'Italia. In this stage, Modiolbanca has a debit position at the Banca d'Italia. Target2 is a European Central Bank's common payment system which conducts payment process of Banca d'Italia and Banque de France, which is central bank of bag seller's country. Bag seller's bank – i.e., BNP Paribas- has a credit position at the Banque de France. So, money moves from balance sheet of Banca d'Italia to balance sheet of Banque de France thanks to settlement process of Target2. Then, Banque de France transfers money to balance sheet of BNP Paribas that bag seller has bank account in. If bag seller demands this money as a cash, money is obtained in his pocket. All process lasts in a minute. And, important point in here is that money flows from a country to another one by cancelling the numbers within balance sheets of banks. In order to realize this kind of payments, banks need a liquidity as a central bank money in their central bank account. They may face lack of deposit and their balance sheet may go below zero. They have to find a liquidity until the end of business day. There are two interest rates in this process. If a bank has lack of liquidity, it can borrow money at the rate of marginal lending facility. On the other hand, it has to face deposit facility rate, which has been negative since June 2014, if a bank deposits money in the central bank. So, in Eurozone, Target2 system gives opportunity to banks to manage their liquidity. They can set limit for payment. And also, they can manage payment ques and

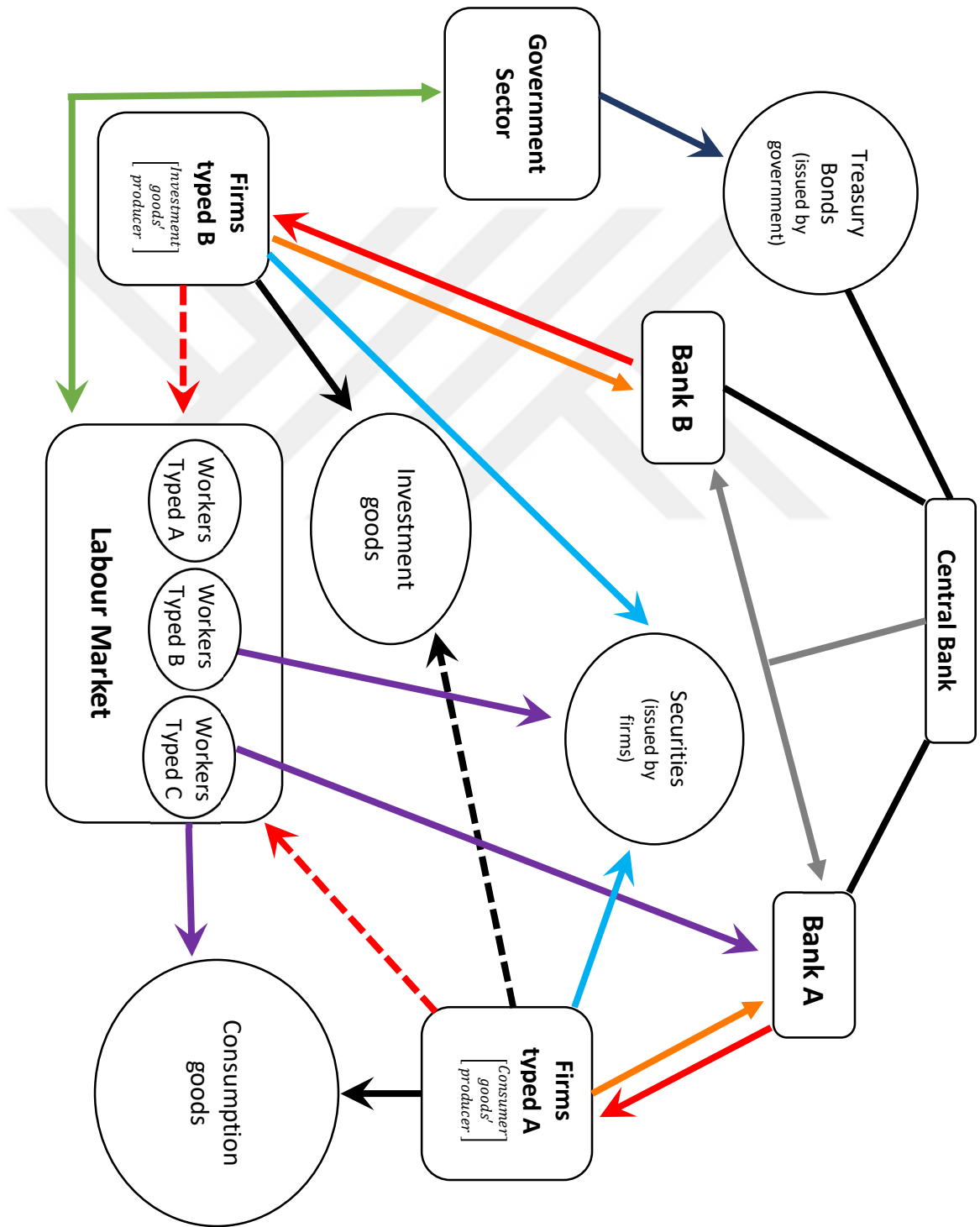
priorities certain payments. Another important example is Canadian system. Lavoie (2019) states that system is operated with zero reserves. Canada has a clearing system, which is Large-Value Payment System (LVTS), contains foreign payments and Automated Clearing Settlement System (ACSS) which is for smaller amount of payments (4). Banks has to settle with LVTS clearinghouse at the end of the business day and must to do on the book of Canadian Central Bank which is settlement agent. There are 17 direct participants in LVTS: I. six big banks in Canada, II. two large credit union, II. a large insurance company, II. a number of small banks, and IV. Some branches of foreign banks as BNP Paribas (5). All of these financial institutions must to have a settlement account in the Canadian Central Bank which is direct clearer. So, sum of LVTS balances of financial institution cannot be differ from zero (7). And, main role of Canadian Central bank monitors the system and to sustain zero sum of supply and demand of settlement account by accommodating the system. LVTS is highly efficient that it is proven (11). And last, monetary authorities can set and control short-term rate of interest no matter what the level of reserve is even if it could be zero (13).

Therefore, as in my explanations of ECB's Target2 system and Canadian LVTS system, role of central bank is ensuring the security of all transaction in the economy. In order to do that, it has to accommodate the expansion of the system. It may affect the level of money supply growth. However, it cannot determine the level of money supply. It can raise the rate of marginal lending facility, as in the example of European system, in order to raise the cost of liquidity. But, this is not a situation, which central bank wants most of the time. Because, defensive nature of central bank causes to avoiding liquidity crisis and sustaining healthy conditions for transactions. As cited by Lavoie (2019), this role is underlined, in post-Keynesian literature, by Rochon and Rossi (2007), Fontana 2009) and Lavoie (2010). In this base, augmented version of monetary theory of production is consist of central bank, which accommodates system and manages process of clearing and settlements. Red arrows denote that firms are granted credit by Banks in order to produce. They purchase labour power in the labour market as it is denoted by dashes red arrows. Labours earn wages. By the way, wages are paid through banks; so that all of wage-earners have a bank account. This is pure credit economy. There are three types of workers in the

augmented model. Workers typed A spend all of their money income by purchasing consumer goods. Workers typed B use of some portion of their money income by purchasing securities issued by firms that it is denoted by blue arrow in the Figure 6, as workers typed C save some portion of their money income as a bank deposit. Decisions of wage-earners how to use their money wages are denoted by purple arrows in Figure 6. So, money which flows back from wage-earners to firms consisting of three form: I. direct flow via buying consumer goods, II. securities that wage-earners purchase, III. Deposits of wage-earners that banks refinance firm with. In the model, there are two kind of firms. Firms typed A are producers of consumer goods as investment goods are produced by firms typed B. So, firms need to investment goods in order to reinvest their capital because of depreciation and change in production technology over the time. Therefore, Firms typed B produce and provide these machines and equipment to all of firms. So that, consumer goods' producers demand investment goods as it is denoted by dashes black arrow while firms typed B provide them that is denoted by black arrow. When firms typed A purchase investment goods from a firm of firms typed B, payment are actualized between Bank A and Bank B via clearing and settlement process of Central Bank. Payment goes through central bank's system of clearing and settlement. Then, it occurs a credit on bank account of a firm of firms' type B which sold investment goods. So, in this stage, Bank A has a debit position at the central bank because his customer makes a payment as Bank B has a credit position at the central bank. This transaction is settled with central bank. It actualizes transaction by providing liquidity if bank A needs. This process between banks is denoted by green arrows. Lastly, firms paid the credit money back to Banks that it is denoted by orange arrows. If they have not enough money to paid their debt. That is, monetary circuit closed with loses and money cannot be destroyed entirely. So, level of firms' debt increase because of refinancing debt by banks. In this model, I assume that firms typed A work with Bank A as firms typed B work with Bank B; and also there is no difference between interest rates among banks. In addition, paradox how firms pay interest rate, as in Graziani's model, solve in this model. It can be paid by refinancing debt, which increases level of firms' debt as I mentioned before. And, government sector may also solve this paradox with increase in deficit. In the Figure 6, green arrow means that

labour demand of government sector and tax payment of wage earners. All of wage earners pay tax for some government services. Navy blue arrow means treasury bonds issued by government to finance government sector. I assume that all of treasury bonds are purchased by just central bank for simplification, otherwise Figure 6 would become very complex. Other agents of course can buy treasury bonds as in reality. In Canada, central bank automatically purchases %10-20 of treasury bonds (Lavoie 2019, 2). Therefore, paradox of how firms pay interest rate is solved in this model thanks to create new money income by expanding government sector. Moreover, it can be solved by also adding foreign market. It is solved directly if current account surplus of economy is assumed.

Figure 6
The monetary circuit



5. CLASSICAL THEORY OF INFLATION

Shaikh (2016, 702) explains classical theory of inflation that theory begins with initial arguments. It is that net profitability (rr'_I) and actual output growth (g_{YR}) are positively related. There are two important factors to induce relation. Their difference determines the sign of effect. First one is that banks' new credit demand of private business is so sensitive to potential profitability as it's explained in Circuitism in chapter 4. Second one is that actual production is driven by profitability. Shaikh said that second factor is more dominant to determine sign of net profitability to inflation. Then, as it exceeds existing level of output growth, the new purchasing power (pp) is also positively related to actual output growth. However, rate of growth-utilization⁶ (r') responds negatively to actual output growth when some critical level is passed. Interactions are logically nonlinear.

$$g_{YR} = F\left(\underbrace{pp}_{+}, \underbrace{rr'_I}_{+}, \underbrace{r'}_{-}\right) \quad (5.1)$$

Inflation rate is equal to the growth rate of nominal output minus growth rate of real output.

$$\pi = g_y - g_{YR} \quad (5.2)$$

Then, Shaikh put forward a general theory depending upon these arguments. In the fiat money system, new purchasing power is positive function of inflation because some portion of new credits is not absorbed by current supply dynamics. This forces to push inflation to up. Net profitability is negative function of inflation because real output rises if net profitability increase. And, growth utilization rate is positive function of inflation,

⁶ On the ground of that maximum balanced rate of growth is the profit rate ($r = P/K$). Growth utilization rate is accumulation rate, which is share of investment in profit ($r' = I/P$). It can be index of growth potential of economy (Shaikh 2016, 695). Accumulation rate is inhibited by maximum rate of growth just like Keynesian theory that full employment limits real output. In the Keynesian theory, aggregate demand drives real output till the point of full employment. If it exceeds full employment, it causes to rise price level. So, economy is more inflation-prone if actual growth rate closes to maximum rate of growth. That is, it approaches to some critical values.

however, it limits real output growth if it goes beyond some critical value. In this foundation, fiat money inflation is determined as it becomes path-dependent; so that there is no normal price level (702).

$$\pi = f\left(\underbrace{pp}_{+}, \underbrace{rr'}_{-}, \underbrace{r'}_{+}\right) \quad (5.3)$$

Capacity utilization and employment are logically similar, in essence, to growth utilization rate. Parallel with Phillips curve, which depend upon the unemployment rate can be made by rewriting the growth utilization rate as one minus capacity utilization ($1-r'$), which is unutilized growth capacity. So, increase in unutilized growth capacity means more unemployment and thus to reduce inflation.

$$\pi = f\left(\underbrace{pp}_{+}, \underbrace{rr'}_{-}, \underbrace{(1-r')}_{-}\right) \quad (5.4)$$

In this theoretical foundation, economy becomes more inflation-prone if disproportionate increase of new purchasing power may lead to fall actual rate of profit. That is, if rate of growth declines sufficient amount than the rate of profit as a result of accelerating stimulus from creation of new purchasing power, then, stagflation would be occur. Because, pumping demand lead to increase growth utilization and employment. This causes that labour market gets tighter. Therefore, wage rate may increase. If actual rate of profit falls because of accelerating demand, newly created purchasing power would not be offset by supply factors. Process ends up increase in both unemployment and price level (703).

Lastly, Shaikh (2016, 703) emphases that if there is positively correlation between net profit and rate of growth utilization, sign of growth utilization (r') would become ambiguous, which causes to the more restricted function in the equation (5.5).

$$\pi = f\left(\underbrace{pp}_{+}, \underbrace{r'}_{+/-}\right) \quad (5.5)$$

6. DATA

For the empirical estimation, I construct panel data for 26 European economies during the period 2007-2018 from the following sources: I. Eurostat database; II. European Central Bank statistics. First of all, in the sample, indicator of demand side for economies is credit variable, which is obtained from European Central Bank statistics. Sample is consisting of three main types of credit variable: I. total credit to domestic households (Households Credit); II. total credit to non-financial corporations, (Private Enterprise Credit); III. Total credit, which is sum of I, II, and total credit to the government sector. These are measured in millions of euro. Then, I denote $\ln credit$, $\ln credit_{pe}$ and $\ln credit_{hh}$ as natural logarithms of them. Secondly, indicators of supply side for economies are variables of profit rate and inactive capacity in the sample. Profit rate is Gross Operating Surplus, GOSR, in this sample. It is provided by Eurostat database and measured in millions of euro. I denote $\ln gos$ as natural logarithm of Gross Operating Surplus. Although Shaikh suggests Net Operating Surplus, NOS, to control profit rate, there is no exact NOS data for European economies. In this point, I check correlation between GOSR and NOS for United States of America. Correlation coefficient is equivalent to 0.99. It illustrates in Figure 16 of appendix. So, it is not a wrong choice to use GOSR as a proxy. Inactive capacity is equivalent to 1 minus current level of capacity utilization. It is a ratio, which parallels unemployment to connect the notion of Philips curve. It is seasonally adjusted and quarterly data which is presented by Eurostat statistics. I use first quarter for each year in this study. On the other hand, dependent variable is harmonized index of consumer price (HICP), which is provided by European Central Bank. $\ln inf$ is natural logarithm of HICP. Summary statistics of total sample is reported in Table 1. Inactive capacity values of Cyprus for the years of 2008-2009 are not available. So, 2 observations are missing. And also, 2018 value of Bulgaria is not available. Therefore, an observation is missing and there are 311 observations for GOSR.

Table 1
Summary statistics of the sample

	Economies	Years	Observation	Mean	Std. Dev.	Min	Max
Inflation	26	12	312	4.568	0.063	4.284	4.682
Total Credit	26	12	312	5.800	0.904	4.118	7.810
Gross Operating Ratio	26	12	311	4.878	0.687	3.403	6.095
Inactive Capacity	26	12	310	22.658	6.954	10.3	47.8
Households Credit	26	12	312	11.861	2.111	7.928	16.19
Private Enterprise Credit	26	12	312	12.546	1.996	8.796	17.07

lncredit, lnredithh, lncreditpe, lngos are measured in logs of millions of euro; inactivecap is equivalent to 1 minus capacity utilization ratio

7. EXPLANATORY DATA ANALYSIS

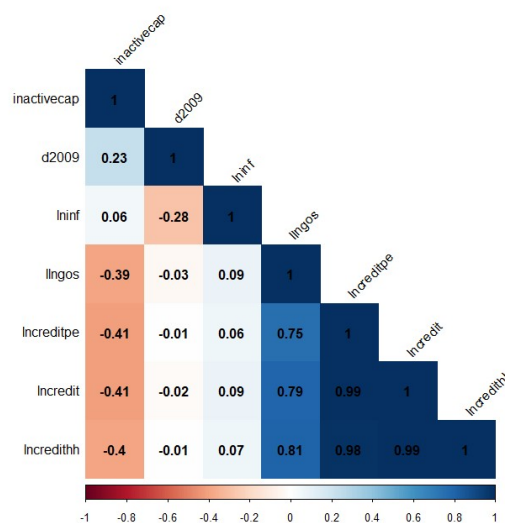
Explanatory data analysis is an approach, which aims to understand structure of data by summarizing main characteristics of it with visual methods. It is statistical approach, which is exactly useful to adapt data into estimation. I use correlogram to visualize correlation matrix and box plot for each variable.

7.1 Correlogram

Correlogram is visual technique to help us visualize correlation matrix. Spectrum of deep brown and dark blue denotes correlation sign between -1 and +1. As it seems, credit variables (lncreditpe, lncredit, and lnredithh) are highly correlated with each other. Their correlation coefficients are around 0.98-99. And, there is positive correlation between profit rate and credit variables (lngos and lncredit, lncreditpe, lnredithh). Log of total credit to

domestic household and log of gross operating surplus are correlated by 0.81 coefficient with each other. There is a 0.75 correlation between log of total credit to non-financial corporations and log of gross operating surplus. And, natural logarithm of level of total credit (lncredit) within the economy is positively correlated by 0.79 with log of gross operating ratio. lninf is a natural logarithm of dependent variable. Its correlation coefficients with independent variables are low and even if it is high, this would not be problem because lninf is dependent variable. It is negatively correlated by -0.25 with dummy variable, which controls 2008-9 financial crisis. This negative correlation is result of contraction of European economies within the crisis. Then, inactive capacity is positively correlated by 0.23 with dummy variable. This makes sense that 2008-2009 financial crisis caused to reduce capacity utilization for economies. And then, inactive capacity is negatively correlated with other independent variables: -0.39 with gross operating surplus (lngos); -0.41 with level of total credit (lncredit); -0.41 with total credit to non-financial corporations (lncreditpe); -0.40 with credit to domestic household (lncredithh). All of these coefficients are illustrated in Figure 7.

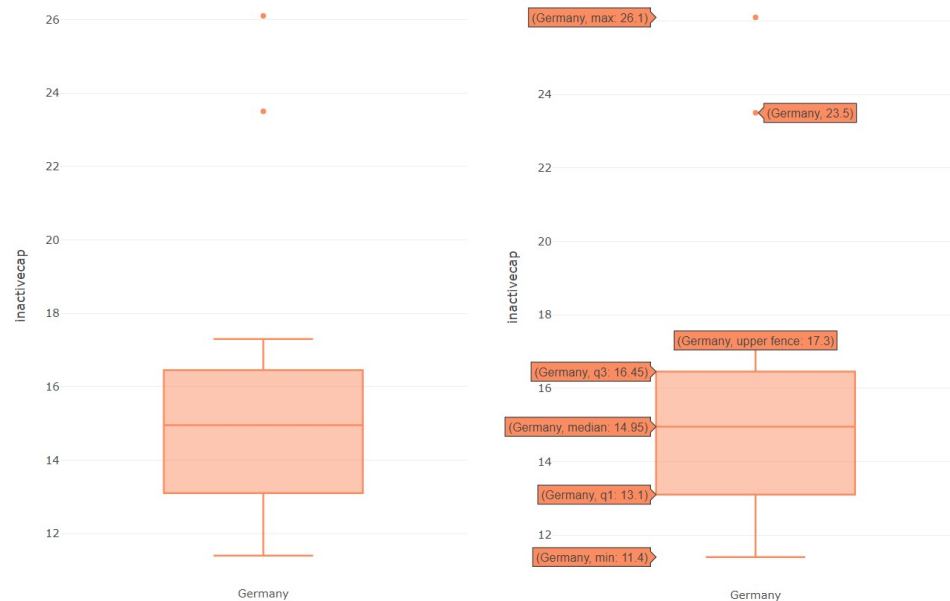
Figure 7
Correlation between variables: Correlogram



7.2 Box Plot

Box Plot, called by Tukey (1997), represent visually quantiles, minimum, maximum, median of data. It summarizes structure of data. And also, it reflects distribution of sample (Chambers et al 1983, 21). In the Figure 8, top and bottom of rectangle represent upper and lower quantiles of the data. Median is horizontal line inside the rectangle. It is central location of data. 50 percent of data distributed inside of rectangle (22). And also, there are lines from top and bottom points of rectangle. And, there are two horizontal line in end of these lines. These are minimum and maximum point of data except for outliers. Therefore, data are distributed in the range between these two lines. Lastly, two outliers are located out of the box plot as it seems clearly in the left graph of Figure 8, which is box plot for inactive capacity of Germany during the period 2007-2018

Figure 8
Box Plot for Inactive Capacity of Germany



Natural logarithms of inflation for European countries are illustrated Figure 9 as box plots. In this figure, four outliers seem clearly in the box plots of Bulgaria, Greece, Latvia and Lithuania. These are values in 2007 for each economy. And, for Estonia, Hungary, and Romania, inflationary process may be felt more than other. Variances of their samples are higher than others because their box plots are larger. For instance, range of minimum and maximum points of Ireland's box plot is low. Therefore, it is not wrong to say that Ireland experienced the slightest inflationary process among 26 European economies. All of the medians of box plots are around 9 which is the logarithmic value of inflation index.

Figure 9
HICP of European Economies: Box Plot

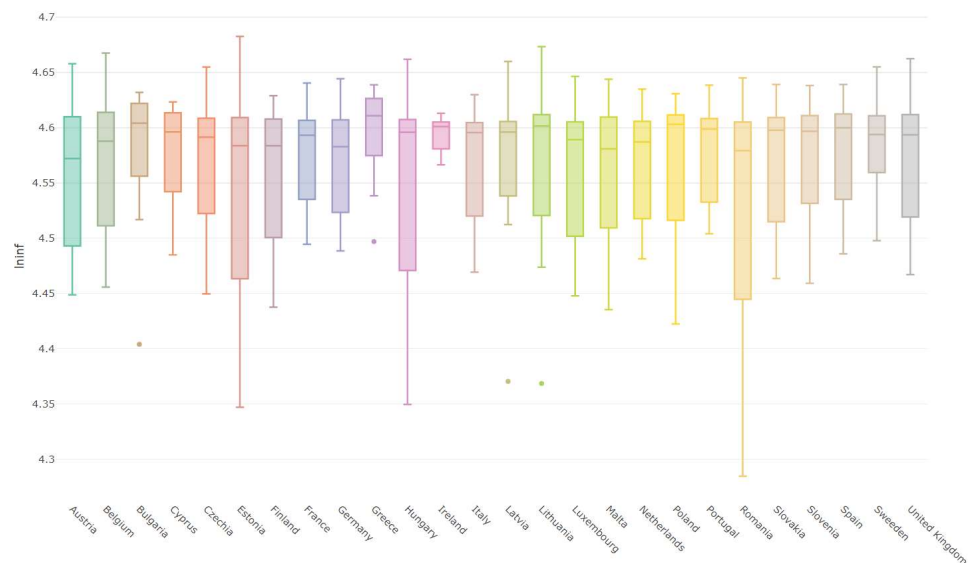


Figure 10, 11 and 12 represent box plots of natural logarithm of total credit, credits to households, and credits to non-financial corporations. Economies have different levels of credit. Hungary seems clearly that it has the highest credit level among 26 economies. Sweden, United Kingdom, Spain, Italy, Germany, France. and Czechia are also higher credit level as it seems in Figure 10. And also, Households credits in Germany and Bulgaria are higher than credits of non-financial corporations if Figure 11 and 12 are compared.

Figure 10
Levels of Total Credit of European Economies: Box Plot

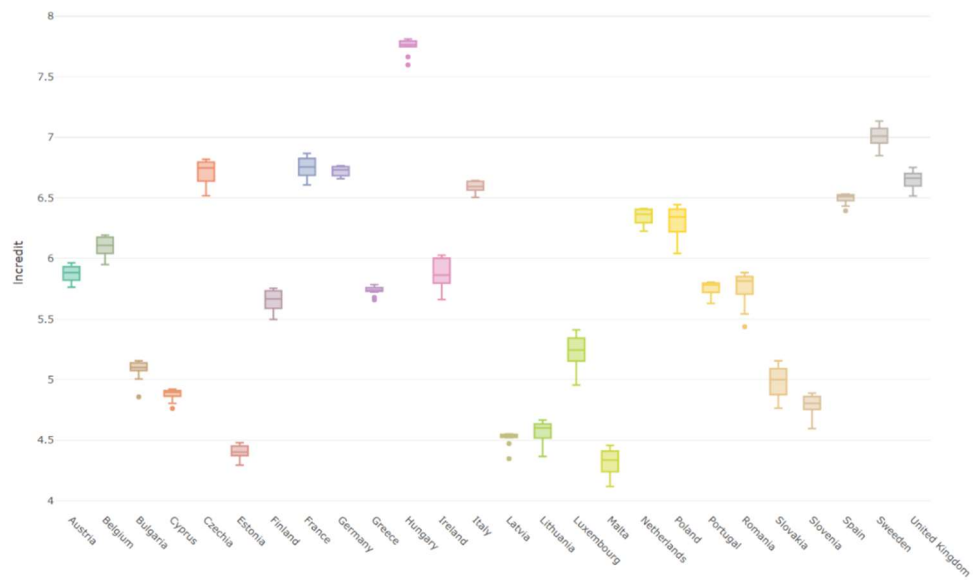


Figure 11
Household Credits of European Economies: Box Plot

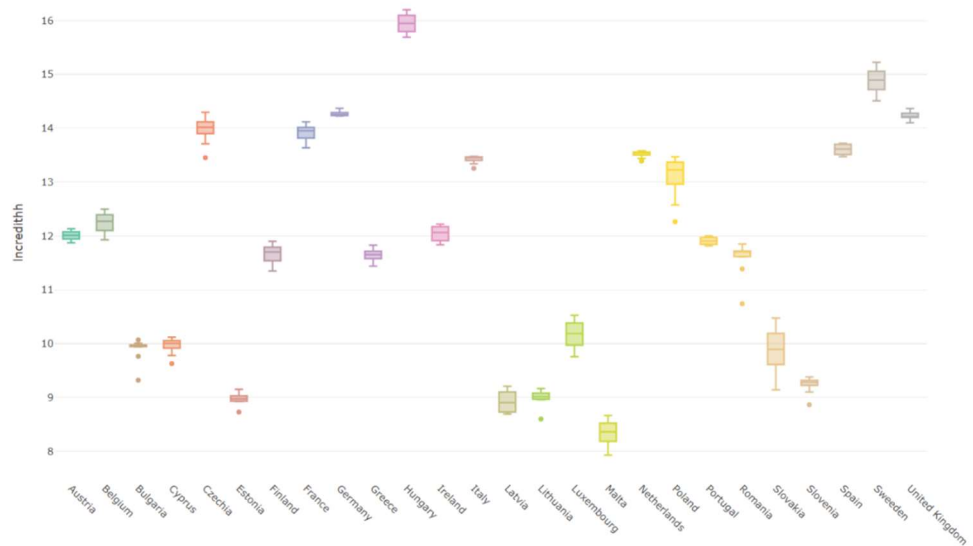


Figure 12
Non-Financial Corporations Credits of European Economies: Box Plot

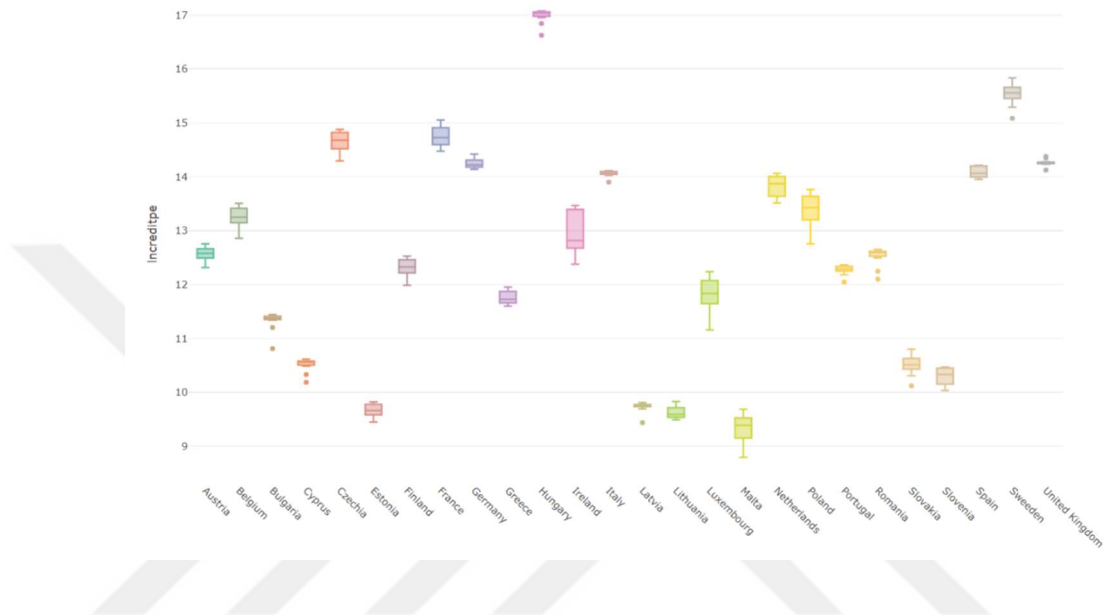


Figure 13 shows box plots of inactive capacity of European economies. Cyprus is a country in which its industries are operated under the lower capacity. There are 17 outliers in the total sample. It most probably is result of 2008-9 financial crisis, which causes to reduce capacities of industries. Luxembourg's box plot is the highest range; so that its variance is larger than all other economies. It is not wrong to say that range of box plox and economic stability are negatively correlated. Because, large range of box plot of inactive capacity means that economy does not endure well against the crisis within the period. And also, we may assume that industrial stability causes to operate optimal level of capacity. By the way, it is also strictly connected genre of crisis and structure of economy. Because, some countries may be affected much more than other. It chances with regard to genre of crisis.

Figure 13
Inactive Capacities of European Economies: Box Plot

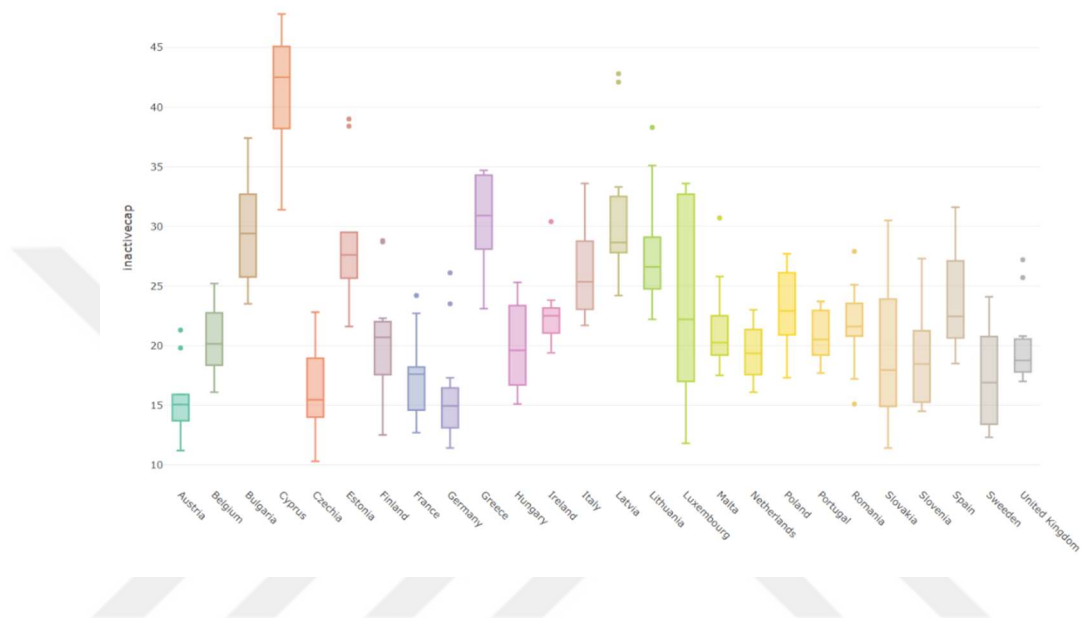
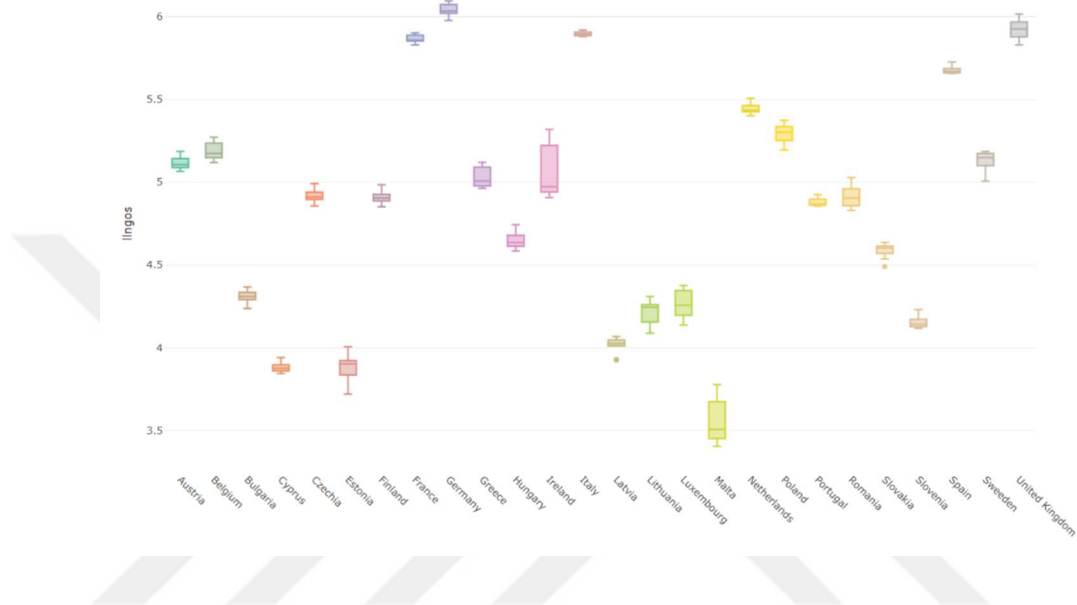


Figure 14 represents box plots of natural logarithm of gross operating ratio for European economies. United Kingdom, Spain, Italy, Germany and France have higher amounts of surplus than other. Germany is the highest one. Except for United Kingdom, ranges of box plots of these economies are so low. It is relatively high for United Kingdom, if it is compared with other four greatest economies of Europe. This may be result of Brexit and its effects to United Kingdom. By the way, these five economies are already main engines for European economy.

And also, ranges of box plots of Malta, Ireland, and Estonia are relatively larger than others. This means higher variance for samples of these economies. Also, profit rates in these economies may fluctuated more than others within the period.

Figure 14
Gross Operating Surplus of European Economies: Box Plot



8. METHODOLOGY

In the recent years, panel data econometrics has become more popular in literature. It provides some advances to improve working small range of time dimension. Panel data is a methodology, which facilitates to work both of cross sectional and time series observations together. Its structure consists of number of time series observations and number of cross-sectional observations. Its implication depends on estimators of fixed or random effects. Arellano & Bond (1991) advanced this methodology such as generalized method of moments estimator. It has been known difference and system GMM.

The panel data methodology requires that individual groups are pooled and only intercepts can be differed across the groups. Blackburne & Frank (2007) states that one of the central finding in this point is that assumption of homogeneity for slope parameters is not appropriate. Pesaran, Shin and Smith (1997, 1999) suggest two important model for estimating nonstationary dynamic panels, which allow heterogeneity across groups. These

are the pooled mean group (PGM) and the mean group (MG) estimators (Blackburne & Frank 2007, 198). Heterogeneity of short run dynamics is allowed in pooled mean group estimation. It is consisting of long run estimators and averaged short run estimator. But, mean group means that estimation includes unweighted mean of N individual regression coefficients. On the other hand, in the dynamic fixed effect estimator (DFE), similar to pooled mean group estimator, the coefficient of cointegrating vector is restricted to be fixed across all panel. Moreover, it restricts that the short-run coefficients and speed of adjustment coefficient are equal. And also, it allows intragroup correlation for calculating standard errors (206). Hausman test is used to decide whether fixed effect is more appropriate or not.

Depending upon formulations of Blackburne & Frank (2007), classical theory of inflation can be modelled in panel data econometrics as following equations:

$$\pi_{it} = \theta_{0t} + \theta_{1t}pp_{it} + \theta_{2t}rr'_{it} + \theta_{3t}(1 - r')_{it} + \mu_i + \epsilon_{it} \quad (8.1)$$

where the number of economies $i = 1, 2, \dots, N$; the number of years $t = 1, 2, \dots, T$; the log of inflation is π_{it} ; the log of total credit is pp_{it} ; the log of gross operating surplus is rr'_{it} ; and unutilized capacity (one minus capacity utilization) is $(1 - r')$. If the variables are stationary in I(1) and cointegrated, error term is I(0) for all i, economy (202). The ARDL (1,1,1) dynamic panel modification of (8.1) is

$$\pi_{it} = \delta_{10} pp_{it} + \delta_{11i}pp_{it} + \delta_{20i}rr'_{it} + \delta_{21i}rr'_{it} + \delta_{30} (1 - r')_{30i} + \delta_{31i}(1 - r')_{31i} + \varphi_i\pi_{it,t-1}\mu_i + \epsilon_{it} \quad (8.2)$$

The error correction re-parameterization of (8.2) is

$$\Delta\pi_{it} = \gamma_i[\pi_{i,t-1} - \theta_{0i} - \theta_{1i}pp_{it} - \theta_{2i}rr'_{it} - \theta_{3i}(1 - r')_{it}] + \delta_{11i}\Delta pp_{it} + \delta_{21i}\Delta rr'_{it} + \delta_{31i}\Delta(1 - r')_{it} + \epsilon_{it} \quad (8.3)$$

where $\gamma_i = -(1 - \varphi_i)$, $\theta_{0i} = \frac{\mu_i}{1 - \varphi_i}$, $\theta_{1i} = \frac{\delta_{10i} + \delta_{11i}}{1 - \varphi_i}$, $\theta_{2i} = \frac{\delta_{20i} + \delta_{21i}}{1 - \varphi_i}$, and $\theta_{3i} = \frac{\delta_{30} + \delta_{31}}{1 - \varphi_i}$.

As γ_i is adjustment parameter for error correction, the long run coefficients are θ_{1i} , θ_{2i} , and θ_{3i} . Long-run coefficients are not primarily interest of this study because time dimension is not wide enough to reflect long-run effects. So, cointegration is not issue for this study. Error correction coefficient, γ_i , is expected to be negative.

9. EMPIRICAL RESULTS

In the appendix, Table 4 reports results of unitroot tests. These are first generation unitroot tests, which assume cross sectional independence. Table 4 is consisting of three unitroot tests: I. Im-Pesaran & Shin (1997, 2003); II. Levin, Lin & Chu (1992, 2002); III. Harris & Tzavalis (1999). Im-Pesaran & Shin (1997, 2003) test shows that variables are stationary except for inactivecap variable. On the other hand, Levin, Lin & Chu (1992, 2002) and Harris & Tzavalis (1999) require balanced dataset. So, NAs occur because of unbalanced data. However, lninf, lncredit, lncreditpe, and lncredithh are stationary at the I(1) according to tests' result. But they are not stationary at the same order. lncredit is already stationary at I(0). This causes problem. Moreover, these tests assume cross sectional independence (CD). So, it has to be checked whether CD exists or not.

In the appendix, Table 5 shows result of average correlation coefficients & Pesaran (2004) CD test. Test result shows clearly that there cannot be cross sectional independence. Therefore, stationary test, which assumes cross sectional dependence has to be used. This type of test is known as second generation test in literature. In the appendix, Table 6 reports result of Pesaran (2006) unitroot test. According to the test's result, lninf lncredit and inactivecap are not stationary at I(0) as lngos lncreditpe and lncredithh are stationary at I(0). At the I(1), variables are stationary. This causes also problem. As a result of non-stationarity in the same order, fixed or random panel data analysis cannot be used because of non-stationarity and cross-sectional dependence. This may most probably lead to violate homogeneity of panel data method. Therefore, nonstationary heterogeneous panel is required.

Table 2 demonstrates results of error correction forms of mean group and dynamic fixed effect (DFE) estimations. It includes also Hausman test result at the bottom. It says that DFE model is more appropriate. So, I concentrate results of DFE estimations. There are three independent variables in this first presentation. Upper side, LR, represents long-run effects as lower side, SR, shows short-run effects. Time range is 12 years. So, short-run effects are more focused than long-run effects. Yet, if we look at LR part, natural log of total credit is statistically significant at 10 percent significance level as inactive capacity ratio is statistically significant at 1 percent significance level. Then, signs of them are appropriate with theory. Natural log of gross operating surplus is not statistically significant. In the SR part, all of variables are statistically significant. Sign of error correction term, (ec), is negative and it's statistically significant at 1 percent significance level. This is coherent with methodology, which says error correction term should be negative. Natural log of total credit, $\ln credit$, is statistically significant at 1 percent significance level. Its sign is positive. So that this is appropriate with classical theory of inflation. Unutilized capacity or inactive capacity, $inactivecap$, is also statistically significant at 5 percent significance level. Sign of variable is negative, which is appropriate with theory. Constant is statistically significance at 1 percent significance level.

On the other hand, it may be most important finding in this thesis that sign of natural log of gross operating ratio, $\ln gos$, is positive. It's statistically significant at 10 percent significance level. Positive sign of profit rate in this sample means, according to classical theory of inflation, that correlation between rates of profit and growth utilization may cause that sign of supply dynamic becomes ambiguous as I mentioned before in the last of the chapter five. Correlation between inactive capacity and gross operating surplus is -0.39 in Figure 7. Inactive capacity is one minus capacity utilization, which is similar to growth utilization in spirit as I mentioned before. This means that there is positively correlation between growth utilization and profit rate a bit in this sample. Positive sign of natural log of gross operating surplus may be result of this notion. In the Figure 17 and 18 of appendix, there are two graphs, which show rates of average growth and total credit growth of European economies and difference of these two. These graphs support hypothesis in which credit

creation, which is proxy of stimulus policies, exceeds average growth of 26 European economies especially until 2015. This may be result of positive sign of gross operating surplus variable.

Table 2
ARDL model of the MG and DFE estimations for 26 European economies
during the period 2007-2018

	MG estimation (Error Correction Form)	DFE estimation (Error Correction Form)
<i>LR</i>		
<i>lncredit (L1.)</i>	0.018 (0.03)	0.152* (1.75)
<i>lngos (L1.)</i>	0.628 (1.45)	0.135 (1.42)
<i>inactivecap (L1.)</i>	-0.002 (-0.21)	-0.003*** (-3.58)
<i>SR</i>		
<i>ec</i>	-0.390*** (-4.26)	-0.260*** (-9.95)
<i>lncredit (D1.)</i>	-0.186 (-1.18)	0.107*** (2.61)
<i>lngos (D1.)</i>	0.272*** (2.67)	0.059* (1.71)
<i>inactivecap (D1.)</i>	-0.000 (-1.00)	-0.001*** (-4.62)
<i>constant</i>	1.209** (2.43)	0.825*** (8.57)
<i>Hausman Test</i>		0.2537
<i>(MG - DFE)</i>		(4.07)

LR represents effect of variables in long-run as SR shows effect of variables in short-run. In the LR part, first lags of variables are run as model requires. Z statistics are in parentheses. ec is error correction term. In addition, result of Hausman test says that Dynamic Fixed Effect model is appropriate. In the parenthesis, 4.07 is a chi2(3) coefficient. *p<0.10, **p<0.05, ***p<0.01

Another reason may be indirect effect of profitability. As I mention in the beginning of chapter 5, Shaikh states that potential profitability is main concern for banks to approve firms' credit demand. Therefore, profit rate may affect positively to inflation in some circumstances. By the way, this is explained in Circuitism in chapter 4. So, Circuitists' explanation of credit creation and circulation is somehow linked to classical theory of inflation. Result shows that this indirect effect is more dominant than direct effect that actual production is driven by profitability.

Table 3 shows the ARDL model of dynamic fixed effect estimations in which left hand side includes dummy for 2008 financial crisis as right hand side contains cluster option for intragroup correlation in the standard error calculation and a dummy for 2008 financial crisis too. Upper side for both of models, LR, results of long-run effects show that natural log of gross operating surplus, lngos, is statistically significant at 10 percent significance level as inactive capacity, inactivecap, is statistically significant at 1 percent significant level. However, total credit, Incredit, is not statistically significant for both of models in the right and left hand sides.

On the other hand, in the lower side, SR, results of short-run effects demonstrate that natural log of total credit, Incredit, is statistically significance at 10 percent significance level. And, it affects positively inflation like what classical theory of inflation says. Log of gross operating surplus, lngos, is not statistically significance. By the way its sign is negative. And also, inactive capacity utilization, inactivecap is not statistically significant. This is most probably result of adding dummy variable to control effect of 2009 Financial Crisis. Because, dummy variable, d2009 is statistically significant at 1 percent significance level. This is relevant in logic because, in the 2008 financial crisis, industries were damaged deeply. This can influence capacity utilization exactly to down and unemployment rate to rise. Lastly, constants are statistically significant at 1 percent significant level for the both of models.

Difference between two model, which right hand side contains cluster option for intragroup correlation in the standard error calculation reflects coefficients as significance of

natural log of total credit. Its significance level falls from 1 percent significance level to 10 percent significance level in the SR side.

Table 3
ARDL model of the MG and DFE estimations for 26 European economies during the
period 2007-2018: cluster option and 2009 Financial Crisis dummy

	(DFE estimation Error Correction Form)	(DFE estimation Error Correction Form) cluster option
<i>LR</i>		
<i>lncredit (L1.)</i>	0.104 (1.29)	0.104 (1.06)
<i>lngos (L1.)</i>	0.163* (1.88)	0.163* (1.85)
<i>inactivecap (L1.)</i>	-0.002*** (-3.01)	-0.002*** (-2.90)
<i>SR</i>		
<i>ec</i>	-0.267*** (-11.06)	-0.267*** (-7.07)
<i>lncredit (D1.)</i>	0.121*** (3.19)	0.121* (1.95)
<i>lngos (D1.)</i>	-0.012 (-0.37)	-0.012 (-0.26)
<i>inactivecap (D1.)</i>	-0.000 (-1.30)	-0.000 (-1.45)
<i>d2009</i>	-0.025*** (-6.63)	-0.025*** (-8.04)
<i>constant</i>	0.882*** (9.88)	0.882*** (8.71)

LR represents effect of variables in long-run as SR shows effect of variables in short-run. In the LR part, first lags of variable are run as model requires. Z statistics are in parentheses. *ec* is error correction term. In the right hand side of table, model includes cluster option, which allows intragroup correlation in the standard errors' calculation. *p<0.10, **p<0.05, ***p<0.01

In the appendix, there are two tables: Table 7 and Table 8. Table 7, differently from previous models, shows estimation of model in which credit variable is natural log of credit to households. Table 8 represents estimation of model in which credit variable is natural log of credit to non-financial corporations. Results are same direction with previous ones. Important point is that coefficient of log of households' credit is higher than coefficient of log of non-financial corporations' credit. It is most probably that households' credit is generally used for consumption. So, consumption effect of households' credit reflects obviously results.

And lastly, I checked robustness of result. I separate sample as core and periphery European economies. Austria, Belgium, Czechia, Germany, Estonia, Finland, France, Lithuania, Latvia, Netherlands, Poland, Sweden, Slovenia, Slovakia, and United Kingdom are classified as core European economies. On the other hand, Bulgaria, Cyprus, Greece, Spain, Hungary, Ireland, Italy, Luxembourg, Malta, Portugal, and Romania are classified as periphery European economies. In the appendix, Table 9 and Table 10 report results of robustness check. In the first table, it is clearly shown that results are more robust. Standard errors are reduced. This means that periphery countries in sample worsen results by increasing error terms. Therefore, estimations in this thesis is appropriate with theory.

10. CONCLUSION

In this thesis, we concentrate on inflationary dynamics of the supply and demand sides of economy. Interaction among agents is crucial to understand the motions of dynamics of system. Therefore, in the chapter two, we begin with mode of capitalist production in order to give general view about system. And, we emphasize, in this chapter, interaction among economic actors. It is located into the center of the thesis. That is, approach of economic analysis in this thesis depends upon a significant law of science, which is emergent properties. It says that interaction creates idiosyncratic property. In other words, aggregates have emergent properties because of interaction. So, aggregate behavior of economic agents

is completely different than summation of identical agents. By following this law, in the third chapter, we try to understand formation of cost, price and profit. Then, we pass to theory of competition. These are important to comprehend the production dynamics of inflation. That is, these create supply possibilities of inflation. In this chapter, we also try to understand three important paradigms in economic theory: I. Neoclassical theory; II. Post-Keynesian theory; III. Classical theory. Then, in the fourth chapter, we examine monetary theories such as monetarist, new Keynesians, new consensus, horizontalist, structuralist, and circuitist. We elaborate monetary theory to understand credit and its creation, which create demand possibilities of inflation. Then, we extend circuit theory of money. And, we present augmented version of Grazinai's model of monetary theory of production. In detail, all of agents in monetary creation are explained as commercial and central banks. After we survey supply and demand sides of the inflationary dynamics, we present classical theory of inflation, which is constructed upon these grounds in the chapter five. Then, data and explanatory data analysis are followed in this chapter. In the chapter eight, we explain ARDL type of dynamic fixed effect estimation. We present and evaluate results of the estimation in the chapter nine. Result is appropriate with classical theory of inflation. In the 26 European countries, inflation during the period 2007-2018 is positively influenced by credits, which represents demand side of inflation; negatively influence by inactive capacity utilization, which makes parallel with Phillips curve and thus to link unemployment; and positively affected by gross operating ratio, which is supply side of inflationary dynamics with inactive capacity. Result, which is positive effect of gross operating surplus is one of the important finding of this research.

Perhaps positive effect of profit rate on inflation is the most important finding in this thesis. We consider that positive impact of profit rate is a reason of demand-pull stimulus policies especially until 2015. Stimulus policies are implied over the credit channels. So, if newly purchasing power is not absorbed by the supply dynamics, economy may be more prone to inflation. In order to support this idea, we check the average rate of growth of 26 countries and total credit expansion between 2008-2018 in the Figure 17 and 18 of the appendix. Rate of credit expansion seems higher than average rate of growth for 26 European

economies until 2015. In the last three years of sample (2016, 2017, 2018), it seems lower than average rate of growth of 26 countries. So, it means deflationary process in these three years.

There is another less possible reason why sign of profit rate is positive. In the beginning of chapter 5, there are two factors, which determine sign of profit rate. First one is that banks' new credit demand of private business is so sensitive to potential profitability as it's also explained in Circuitism in chapter 4. Second one is that actual production is driven by profitability. In this thesis, second one may be more dominant than first one, despite Shaikh's emphasis, which first one is dominant for determining sign of profit rate.

In this thesis, we consider to contribute literature two important things. First one is that we expand the demand dynamics of inflation. Mostly post Keynesian and also European circuitism are investigated in the context of classical theory of inflation. We link circuitism and its explanation of monetary creation with classical theory of inflation. In the Shaikh's book, we think, he did not enter monetary creation enough. So, especially chapter four completes some of the absence parts of classical theory of inflation by detailing demand side dynamics of inflation due to understand money creation and circulation in the fiat money system. We aim to expansion of monetary creation in order to strengthen classical theory of inflation in this thesis. Second one is econometric part of the theory. We use ARDL type of dynamic fixed effect estimation for 26 European economies. Differently from Handfas (2012), who tests this theory with vector error correction model, we present new findings, which is reached with different methodology and sample. Findings are appropriate to classical theory of inflation. These findings reveal also the supply and demand dynamics of the 26 European economies during the period 2007-2018.

11.APPENDIX

Figure 15

Manufacturing average and incremental rates of profit

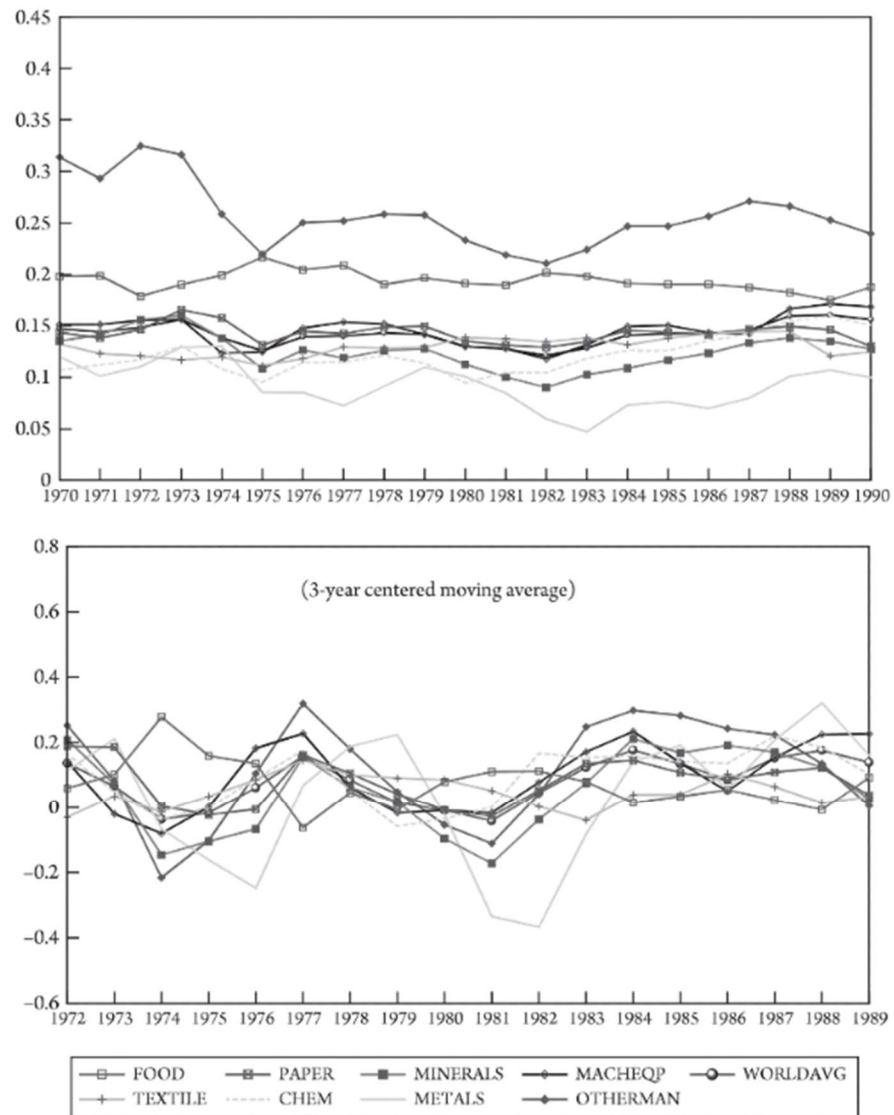
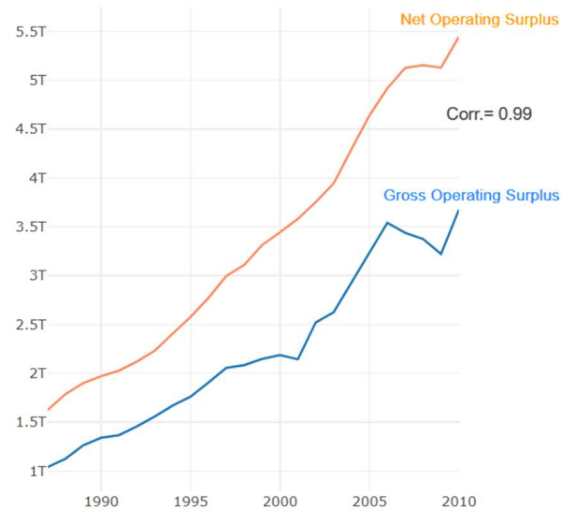


Figure 7.13 World Manufacturing Average and Incremental Rates of Profit, 1970-1989
Source: Shaikh 2016, 303.

Figure 16
Gross and net operating surplus of United States of America



Source: U.S BEA

Table 4
Unitroot tests with the assumption of cross sectional independence

	<i>Im- Pesaran & Shin</i> (1997, 2003)		<i>Levin, Lin & Chu</i> (1992, 2002)		<i>Harris & Tzavalis</i> (1999)	
<i>Variable</i>	<i>I(0)</i>	<i>I(1)</i>	<i>I(0)</i>	<i>I(1)</i>	<i>I(0)</i>	<i>I(1)</i>
<i>lninf</i>	0.000***	0.000***	0.528	0.000***	0.717	0.000***
<i>lncredit</i>	0.000***	0.000***	0.000***	0.000***	0.632	0.000***
<i>lngos</i>	0.001***	0.000***	NA	NA	NA	NA
<i>inactivecap</i>	1.000	0.000***	NA	NA	NA	NA
<i>lncreditpe</i>	0.000***	0.000***	0.144	0.000***	0.364	0.000***
<i>lncredithh</i>	0.001***	0.000***	0.459	0.000***	0.270	0.000***

These are tests, which check stationarity. NAs are result of unbalanced panel. In addition, these tests assume cross sectional independence. *p<0.10, **p<0.05, ***p<0.01

Table 5
Average correlation coefficients & Pesaran (2004) CD test

<i>Variable</i>	<i>CD-test</i>	<i>p-value</i>	<i>corr</i>	<i>abs(corr)</i>
<i>lninf</i>	57.62	0.000***	0.931	0.931
<i>lncredit</i>	53.70	0.000***	0.868	0.870
<i>lngos</i>	42.17	0.000***	0.682	0.795
<i>inactivecap</i>	38.88	0.000***	0.623	0.677
<i>lncreditpe</i>	30.90	0.000***	0.498	0.623
<i>lncredithh</i>	21.67	0.000***	0.349	0.655

Data is consisting of 26 panel and 12.24 average of observation. Panel is unbalanced. Null hypothesis is cross-sectional independence. *p<0.10, **p<0.05, ***p<0.01

Table 6
Pesaran (2006) unitroot test
with the assumption of cross-sectional dependence

<i>Variable</i>	<i>I(0)</i>	<i>I(1)</i>
<i>lninf</i>	0.008***	0.000***
<i>lncredit</i>	0.000***	0.000***
<i>lngos</i>	0.817	0.000***
<i>inactivecap</i>	0.003***	0.000***
<i>lncreditpe</i>	0.113	0.000***
<i>lncredithh</i>	0.866	0.013**

Null-hypothesis assumes that all series are non-stationary. *p<0.10, **p<0.05, ***p<0.01

Figure 17

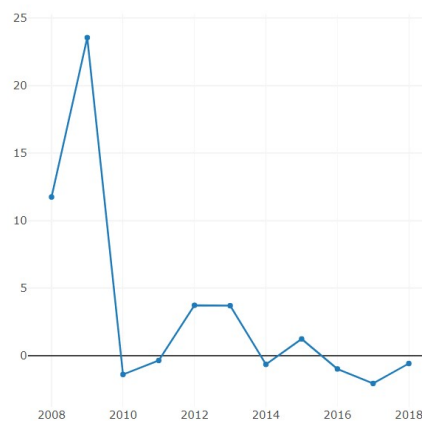
Rates of average growth and total credit growth of 26 European economies



Source: ECB, Eurostat

Figure 18

Difference between rates of average growth and total credit growth of 26 European economies



Source: ECB, Eurostat

Table 7
ARDL model of the DFE estimators for European economies in which
credit variable is households credit

DFE Estimation Error Correction Form			
<i>Households Credit</i>			
<i>LR</i>		<i>D2009</i>	<i>D2009 & cluster option</i>
<i>lncredithh (L1.)</i>	0.122*** (4.21)	0.105*** (4.23)	0.105*** (3.35)
<i>lngos (L1.)</i>	0.101 (1.14)	0.102 (1.33)	0.102** (2.00)
<i>inactivecap (L1.)</i>	-0.003*** (-2.98)	-0.002** (-2.37)	-0.002** (-2.20)
<i>SR</i>			
<i>ec</i>	-0.213*** (-9.35)	-0.227*** (-10.80)	-0.227*** (-7.99)
<i>lncredithh (D1.)</i>	0.087*** (5.36)	0.087*** (6.00)	0.089*** (2.80)
<i>lngos (D1.)</i>	0.089*** (2.68)	0.015 (0.46)	0.015 (0.42)
<i>inactivecap (D1.)</i>	-0.0009** (-3.94)	-0.0001 (-0.54)	-0.0001 (-0.53)
<i>d2009</i>		-0.024*** (-6.86)	-0.024*** (-8.40)
<i>constant</i>	0.589*** (6.01)	0.669*** (7.36)	0.669*** (8.26)

LR represents effect of variables in long-run as SR shows effect of variables in short-run. In the LR part, first lags of variable are run as model requires. Z statistics are in parentheses. ec is error correction term. In the right hand side of table, model includes cluster option, which allows intragroup correlation in the standard errors' calculation. *p<0.10, **p<0.05, ***p<0.01

Table 8
ARDL model of the DFE estimators for European economies in which
credit variable is non-financial credit

DFE Estimation Error Correction Form			
<i>Non-Financial Credit</i>			
<i>LR</i>		<i>D2009</i>	<i>D2009 & cluster option</i>
<i>lncreditpe (L1.)</i>	0.068** (1.98)	0.058** (1.96)	0.058 (1.32)
<i>lngos (L1.)</i>	0.09 (0.87)	0.101 (1.10)	0.101 (1.01)
<i>inactivecap (L1.)</i>	-0.004*** (-3.11)	-0.002** (-2.39)	-0.002** (-2.06)
<i>SR</i>			
<i>ec</i>	-0.238*** (-12.17)	-0.254*** (-13.98)	-0.253*** (-10.30)
<i>lncreditpe (D1.)</i>	0.044*** (3.31)	0.053*** (4.25)	0.053*** (2.80)
<i>lngos (D1.)</i>	0.047 (1.36)	-0.031 (-0.93)	-0.031 (-0.59)
<i>inactivecap (D1.)</i>	-0.0012*** (-4.75)	-0.0003 (-1.35)	-0.0003 (-1.38)
<i>d2009</i>		-0.026*** (-6.91)	-0.026*** (-8.34)
<i>constant</i>	0.813*** (8.84)	0.876*** (10.31)	0.876*** (8.23)

LR represents effect of variables in long-run as SR shows effect of variables in short-run. In the LR part, first lags of variable are run as model requires. Z statistics are in parentheses. *ec* is error correction term. In the right hand side of table, model includes cluster option, which allows intragroup correlation in the standard errors' calculation. *p<0.10, **p<0.05, ***p<0.01

Table 9
ARDL model of the DFE estimators for core European economies:
A robustness check

DFE Estimation Error Correction Form			
<i>Core European Economies⁷</i>			
<i>LR</i>		<i>D2009</i>	<i>D2009 & cluster option</i>
<i>lncredit (L1.)</i>	0.255*** (3.86)	0.227*** (3.30)	0.227*** (2.99)
<i>lngos (L1.)</i>	0.382*** (3.11)	0.370*** (3.00)	0.370** (1.96)
<i>inactivecap (L1.)</i>	-0.002*** (-2.27)	-0.0025** (-2.09)	-0.0025** (-2.16)
<i>SR</i>			
<i>ec</i>	-0.342*** (-8.18)	-0.337*** (-8.14)	-0.337*** (-4.95)
<i>lncredit (D1.)</i>	0.277*** (4.70)	0.264*** (4.52)	0.264*** (2.70)
<i>lngos (D1.)</i>	0.203*** (4.21)	0.155*** (2.96)	0.155* (1.74)
<i>inactivecap (D1.)</i>	-0.001*** (-2.97)	-0.0006* (-1.66)	-0.0006 (-1.57)
<i>d2009</i>		-0.011** (-2.13)	-0.011 (-1.60)
<i>constant</i>	0.431*** (2.71)	0.500*** (3.12)	0.500** (2.18)

LR represents effect of variables in long-run as SR shows effect of variables in short-run. In the LR part, first lags of variable are run as model requires. Z statistics are in parentheses. ec is error correction term. In the right hand side of table, model includes cluster option, which allows intragroup correlation in the standard errors' calculation. *p<0.10, **p<0.05, ***p<0.01

⁷ Core European Economies: Austria, Belgium, Czechia, Germany, Estonia, Finland, France, Lithuania, Latvia, Netherlands, Poland, Sweden, Slovenia, Slovakia, United Kingdom

Table 10
ARDL model of the DFE estimators for periphery European economies:
A robustness check

DFE Estimation Error Correction Form			
<i>Periphery European Economies⁸</i>			
<i>LR</i>		<i>D2009</i>	<i>D2009 & cluster option</i>
<i>lncredit (L1.)</i>	0.007 (0.04)	0.011 (0.07)	0.011 (0.06)
<i>lngos (L1.)</i>	0.15 (0.97)	0.172 (1.29)	0.172 (1.44)
<i>inactivecap (L1.)</i>	-0.002 (-1.35)	-0.001 (-1.09)	-0.001 (-0.94)
<i>SR</i>			
<i>ec</i>	-0.239*** (-6.05)	-0.256*** (-7.37)	-0.256*** (-5.48)
<i>lncredit (D1.)</i>	-0.00005 (-0.00)	0.051 (0.93)	0.051 (1.05)
<i>lngos (D1.)</i>	0.0071 (0.12)	-0.065 (-1.23)	-0.065 (-1.42)
<i>inactivecap (D1.)</i>	-0.0007* (-1.75)	0.00008 (0.22)	0.00008 (0.21)
<i>d2009</i>		-0.0299*** (-5.64)	-0.0299*** (-10.23)
<i>constant</i>	0.936*** (6.67)	0.971*** (7.90)	0.971*** (8.35)

LR represents effect of variables in long-run as SR shows effect of variables in short-run. In the LR part, first lags of variable are run as model requires. Z statistics are in parentheses. *ec* is error correction term. In the right-hand side of table, model includes cluster option, which allows intragroup correlation in the standard errors' calculation. *p<0.10, **p<0.05, ***p<0.01

⁸ Periphery European Economies: Bulgaria, Cyprus, Greece, Spain, Hungary, Ireland, Italy, Luxembourg, Malta, Portugal, Romania

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