ANALYSIS OF STOCHASTIC INFLATION IN THE INTERACTION OF SUPPLY AND DEMAND REGARDING THE ASPECT OF DINAMIC CAUSALITY

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Abstract. *Systematic analysis of the development of understanding the causes of inflation, taking supply and demand conditions as the central axis, offers a deeper insight into the inflation process and its essence. It is obvious that the long-term inflation impacting human, productive and financial resources can in no way be justified by extremely short-term benefits to a country's budget or to monopolistic structures. Analysis of the literature clarifies and confirms the fact that in order for inflation to occur and significantly accelerate, the growth of demand factors must exceed that of supply factors during several years. The research shows that the policy of encouraging the demand, and thus a significant and long-lived inflation, is possible only in non-competitive oligopolistic economies marked by corruption and provoking emigration. On the other hand, adjustment of demand instruments to changes in supply is rather a result of fair competition. Interest rate change as an independent factor is shown to be important for the inflation process, especially for deflation, and therefore for the economy. Moreover, it is not completely clear whether delayed is the cause of inflation or its result, but it is obvious that the negative impact of delayed demand, as delayed human and social well-being, results in weaker supply and thereby also in higher poverty and inflation, all of them encouraging a more thorough examination of this problem. Analysis of the phenomenon of inflation over a historic period provides a realistic picture of this problem and shows the ways how to solve it.*

Key words: *inflation, demand, supply, delayed demand*

Introduction

The current economic crisis is inseparable from the inflation–deflation processes. The economic downturn of Lithuania and of the other Baltic states in 2009 and 2010 was conditioned by the overly rapid economic expansion in the period 2004–2008, which was closely related to inflation. Thus, it is only natural to ask whether inflation, and which type of it, could be the reason for the aforementioned crisis. If yes, then this process has to be approached from a different point of view. In the years under analysis, people persistently tried to grasp which type of inflation – demand or supply – comes first. Modest calculations and evaluations have shown that when a rapid growth of demand is formed while supply is either neglected or suppressed, the resulting inflation should, "like the first swallows before rain, make you restless and prepare" because "the

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situation is taking hold of the country whisk is exacerbated by the approaching clouds of the worldwide economic-financial crisis" (Butautas, 2006, 2008). The significance of expectations and postponed demand have also been acknowledged for inflation, which is very important. But even more important is to recognize and to understand not which type of inflation causes certain events, but how to control the process within the range of 2.3 to 2.5 percent, because inflation is moderately inert (Самуэльсон, Нордхаус, 2007). It is obvious that supply cannot exist separately from demand (through expectations, delayed demand and recognition), and every increase in demand is reflected in supply and price. In the same way, supply requires an adequate demand.

Nowadays, it is accepted that in order to increase the well-being of a person, society and the country and to ensure competitiveness, *low inflation and unemployment are essential* (Phelps, 2007). If these macroeconomic objectives are not met, then there is an increase in poverty and emigration. As prices rise, people need to work more, they reduce consumption and investment, employment levels decrease, and inflation can cause an irreversible depreciation of capital (Keynes, 1936). As one can see, the problem under investigation is relevant to any period of time. Although these objectives are publicly recognised, most often they are not achieved. That might be because of an overly fragmented understanding of inflation, the prioritisation of short-term objectives over long-term ones, the deflation of values such as incorrect price (i.e. inflation) becomes the cause of an economic crisis (Jurgutis, 1993). That is why it is necessary to adapt the scientific argumentation regarding this process to present-day requirements.

Meanwhile, the research has appeared that changes in the interest rate are not the least among the issues that permit the formation of adequate demand and competitive supply.

Objectives: 1. To investigate and approve or reject the reason for the demand of inflation primacy regarding the supply. 2. To examine the significance of monopolistic structures for the dynamics of inflation. 3. To specify the relation between postponed demand and inflation.

Methods: analysis of the scientific literature; analysis, synthesis, interpretation, comparison and generalization of historical scientific data.

The nature of the research required a defined and consequently dynamic hypothesis: 1. How acknowledging the priority of demand factors with regard to inflation can help better reveal supply factors in the stabilisation of price changes? 2. Inflation is only possible under conditions of imperfect competition when the lack of supply means that prices are determined by demand rather than by changes in production levels.

Theoretical foundation. The classical (Smith, Ricardo, Mills and others) microeconomic comprehension of prices had deep traditions (St. Augustine, St. Thomas of Aquino, Diocletian) continued developing in the shelter of the correct comprehension of prices during the transformation of economics from feudal to modern. Say and Senior acknowledged that the price of demand is influenced by saving and higher supply, i.e. a greater and fair competitive market (Smith). Amid the overproduction crises of the 19th century, Malthus (Boisguilbert) pointed out that in order to have an effective economy and stable prices, the problems such as poverty and distribution have to be solved. Mill added the expectations which reflect the relation between the power of monopolies and with the buyer in a perfect competition in supply / demand costs. He also added the post-crisis deflation and the general dependency of prices to the spectrum of different groups of goods depending on the difference in cost variations. He understood that "only in backward countries is the objective of manufacturing the sole priority". This priority also has to be analysed in a way that connects supply and demand (Martisius, 2005). But the question "why do prices rise?" is still here; as a consequence, Walras replied: "*When demand is higher than supply*", and Jevons added: "Because of the lack of information", which interested monopolies to diminish the marginal return on production costs. Wicksell (and Marshall) added more clarity by first connecting the problems of prices, money and economic cycles. Though conditioned by the prevailing gold standard, their analysis is to some extent still valid today. They argue that money causes an imbalance of supply and demand and distorts the equilibrium. They also pointed out the significance of a stable wage and of the interest rate as an independent agent affecting inflation. Marshall (and Wicksell) linked marginal sizes with the unwillingness of monopolies to share the market with its weaker participants. He also pointed out that in order to have economic equilibrium, "there must be a small cause – price", distinguishing the short-and long-term causes of inflation. Notably, Marshall acknowledged that monopolies do not form part of the market economy but are only a deviation from it. Veblen, upon analysing the shortcomings, suggested creating new institutions since the *old, inert* ones only serve the cause of rising prices, while Chamberlin and Robinson again pointed out the effect monopolies have on prices, even halting technological advancement which could reduce production costs.

When the time came to systematise the Prices Theory and connect supply and demand into a whole, the microeconomics of the classics for a good reason became part of Keynes's macroeconomics. The fact that Keynes was interested in business (micro-) and not only in government (macro-) dealings is shown by his deep analysis of supply factors, which refers to the importance of wages, limited capital effectiveness, employment and technologies while speaking about the supply costs in long- and short-term periods. The price is also influenced by expectations, i.e. tendencies to consume and save in the light of changes in wages. A total analysis of the demand and supply factors allowed Keynes to clearly determine the definition of inflation which could be easily applied also nowadays (Phelps, 2007): true inflation begins when the demand increases the price of resources but not the manufacturing volume. Considering that the encouragement of demand is always the market commodity that is always attractive, it needs some boundaries. This was one of the aspects Samuelson reflected on when quite precisely establishing the maximum rate of inflation (3%) above which the inflation processes become harmful. Monetarists have also warned that money is always the cause of inflation, even if it can allow a greater flexibility while reacting to supply shocks. But no due attention was given to these warnings.

Thus, there arose the necessity to reconsider the problem, as there was no effective dialogue between the fields of macro- and microeconomics, supply and demand, through rational expectations. In fact, Samuelson had already given start to such discussion, while the dependence on the demand factors of Mises's *business cycles* as well as Hayek's *price and competition* demanded a more rational underpinning of the inflation problem. But even rational expectations theory, grounded essentially on the mutual significance of expectations for *technological advancement or investments* (supply), i.e. the dialogue with the future, and for demand decisions (by the government and central bank), and stressing the significance for prices of *information and new institutions* (Lucas), does not cover everything as that is not a simple task. Attention is not paid to the great differences of expectations among countries at diverse stages of development or to the scale of the globalisation of inflation, which can be called *imported inflation* (Stiglitz, 2008). In this rift between supply and demand, there arises the problem of postponed demand which, like inflation, is the start of a dialogue between the past and the future. The goal of this modest work is to try once more to relaunch an effective dialogue between the various theories that study inflation, something that, unfortunately, exceeds the limited human capacity. The significance of the interest rate and its link with inflation still remain unclear (Stiglitz, 2008).

Logical basis of the hypothesis. This research aims to confirm that demand factors are the primary cause of inflation, which, as the research has shown, is also significant under conditions of imperfect competition. The more an economy is oligopolised, the starker is the inflation. The question of how the globalisation of the world market affects local economies is not addressed, although this link may deepen in the future. A review of the literature has offered an abundant confirmation of the hypothesis that demand is the primary reason for inflation, and the existence of monopolies is a very influential part of that reason; it revealed that the theories that analyse inflation are closely interrelated and complementary. It is obvious that monopolistic structures, together with the public sector, do not have much interest in increasing competition and supply; that is why economic, legal etc. institutions are employed in order to reduce manufacturing costs, capital tax and to increase the budget deficit, money, price and profit. When there is a lack of competition, the long-term, ineffective demand finally increases the price of supply. When, on the other hand, the inert price of supply exceeds the capability of demand, the economy is misbalanced. In order to remain competitive, enterprises reduce manufacturing costs which involve labour wages and employment. Therefore, the crisis caused by inflation progresses into a deflationary period. Examination of the link between delayed demand and inflation permits the formation of some "financial wisdom" for understanding the significance of such postponement not only for inflation, but also for purchasing, investments and employment. It is obvious that the Inflation Management Model should include the interest rate as an independent variable. It is also important to research the influence that marginal sizes have on inflation and competition.

The article is composed of three parts: an introduction which identifies the problematic field, an overview of the literature, and conclusions. The research part is being prepared as a separate article. In the Introduction, the problem of inflation is presented in general terms, with a sufficient width and clarity to be understandable beyond the circle of specialists in the field (Kardelis, 2005). In the literature overview, I shall examine the dynamism of the problem of the causes of inflation exclusively according to the historicality of the authors in a stochastic sense, employing the latter to explain the inflation process which functions differently under diverse conditions. Such analysis of the inflation phenomenon in the course of history, over centuries rather than year-to-year, highlights and makes understandable the process of coming to terms with the issue in focus. It can also help (Kardelis, 2005): a) to understand the problems faced at present; b) to know what should be changed in the current system; c) to free ourselves from the burden of the past by trying to understand it; and d) to create the conditions for forecasting the current and future price trends. Moreover, "without a constant review of contemporary historical research literature, scientific knowledge could not progress" and "one can review the past more neutrally than one can the present". This research examines the problem of inflation consistently and systematically, and is therefore important for the theory and practice of education (Kardelis, 2005). The conclusions present a brief evaluation of what has been accomplished.

The historical process of the recognition of the stochastic nature of inflation as a precondition for solving the problem

The importance of the link between supply and demand has been known and analysed for a long time. Since the 4th century BC, the reason for the increase in prices was referred to by K. Vishnugupta ("Arthashastra" – teachings about income) as an inadequacy between supply and demand (Čiegis, 2006). It is mentioned that the price is increased by the "competing buyer". Also, it was recognised that the price increases when the supply is low. Xenophon (430–355 BC "Economicos" – about household) pointed out how supply and productivity are important to the price of goods. St. Thomas Aquinas (1227–1274) thought (Jurgutis, 1933) that society, through justice in exchange between individuals and through distributive justice within society, its organizations and persons, has to ensure that the value of an item would be determined by its production cost and its benefit, not by the supply and demand at a certain price, and that each party of a transaction would receive the same value from it (Boisguilbert, Malthus, Say and others). St. Augustine (354–430) also acknowledged the origins of expenditure costs, which are increased by profit and interest (Čiegis, 2006). The Thomistic cost–value supply essentially provides a just, though partially interventionist, price for goods, which is determined by the income received. This means that supply has to accord with demand, and vice versa. In such an economy, no inflation – i.e. unfair price – should arise. Aquinas, moreover, states that a *fair price* must permit a person to live with dignity, and he acknowledges the importance of external intervention of monetary resources, precious metals and jewels for demand and price. As one can see, already in those days the question of which is first, supply or demand, was heartily pondered. Meanwhile, the Thomistic price function of value and benefit was successfully assumed and developed by Jevons and Walras.

P. Boisguilbert (1646–1714, "Ponderings about the origins of wealth, money and taxes"), A. Smith (1723–1790, "On the origin and causes of the wealth of nations", 1776), D. Ricardo (1772–1823, "The principle of political economy and its taxing", 1817) all acknowledged the influence of costs (Jaskelevičius, 2007) on price formation, but did not consider the issue of inflation. However, he was the first to point out poverty as the reason for inadequate demand, while Ricardo pointed out that a short-term increase in prices can be affected by the demand factors, such as the increase in demand, the fall in money value, the increased price of essential goods. The latter also stated that *work while being affected and working through capital demand and through the number of people, the price gets stable* (Šalčius, 1991). But when the price is increased, wages are increased as well, although profit (and capital) is decreased, as is also the demand of work. In this case, while the inflation increases, the population should decrease or emigration increase; that is why advancement in technology and a better Mill distribution are required. In the aspect of supply, A. Smith stated that "the price changes when one of the parts of price composition changes", although he did not mention that these changes can equalize each other. An important position of Smith was that a surplus amount of money "cannot increase the wealth of the country". This can be acknowledged as a non-inflation growth perspective in economics. That is why the natural price of supply is more important than the market price or demand (Čiegis, 2006), while *the demand price becomes equal to supply cost in the long-run* (Šalčius, 1991). Because of this, according to Marshall, the biggest, although temporary, gain (excess profit) is achieved. This classical microeconomic principle concerning prices, later reflected in the rational expectations and the insight of Smith that the prices of supply and demand (expected and actual inflation) cannot be different for a long term, was crucial in this theory.

N. Senior (1790–1864, "Political economy essays", 1836) recognized that fair competition and precious metals have an impact on the value, which Casiel referred to as price (Šalčius, 1991). He analysed the demand through savings, while the supply was considered through the scarcity of goods (Walras). Although the look at the value of money and the reasons for it were simplified, while speaking about the consumption and scarcity of goods, we can actually get in touch with the reasons for inflation in the aspects of supply and demand. A. B. Say (1767–1832, "Tract of political economy", 1803, "Catechism of political economy", 1817) spoke against restrictions and in favour of a bigger supply. He pointed out that supply has to be equal to demand (Čiegis, 2006) and denied that overproduction is bad, because goods can be bought for other goods. However, it is forgotten that wages in different sectors can be different. He agreed that it is important to consider restrictions theory which states that problems of one sector are compensated by another one (Šalčius, 1991), i.e. that when the price of one type of goods increases and of the other type decreases, an equilibrium should be formed in terms of price range. However, the experience has shown otherwise.

T. R. Malthus (1766–1834, "Analysis of political justice", 1793; "Principles of political economy", 1820) agreed with Boisguilbert's revolutionary statement that a man in poverty, although being non-productive, produces "an opportunity for the realisation of capitalist profits", and the shortcomings of supply (Say) are the reasons for a high poverty (Čiegis, 2006). This means that small supply results in small demand. Of course, rephrasing Malthus' idea that "*a wealthy man can buy but does not want, and a poor man wants to buy but cannot* perfectly reflects the broad spectrum of the first hypothesis that not only inflation causes problems in supply and demand (Šalčius, 1991) which, without a better distribution fall into a vicious circle in which supply and demand obtain the same weight. Tiunen regards this problem as a cause of *meagre productivity*, i.e. supply, while Sismondi – of too widespread poverty, i.e. delayed demand (Šalčius, 1991). As one can see, the dialectic problem of those days in terms of economic thinking, contradictions between profit and poverty, which is more important, supply or demand, were the main topics of economic discussions. And that is not all. In the 19th century, because of the inadequate comprehension of the meaning of demand, some years always showed an overproduction crisis – 1825, 1836, 1847 and so on (Čiegis, 2006). These years of crisis formed the need to look at the prices and economics from a different approach than supply, which P. Boisguilbert, T. Malthus, and other scientists gave start to.

J. S. Mill (1806–1873, "On the Definition of Political Economy", 1836; "The Principles of Political Economy", 1848) acknowledged the importance of expenditure costs (Čiegis, 2006) and, together with T. Tooke and J. Fularton, stated that money isn't the primary cause of inflation because "supply of money is a secondary factor, and the amount of it in circulation adapts to the needs of the market", and "prices are followed by the credit, not the other way round", although later he agreed that "the prices of goods are regulated by the amount of money currently in circulation", that is why the amount of currency cannot be higher, after assessing savings, than the amount of deals made (GDP) (Fisher, Keynes). He effectively connected monetary crisis with deflation. He, like Smith, also agreed that the free market is only possible under conditions of fair competition because prices are directly affected by competition, and only when the latter is perfect the market prices comply with supply and demand. Mill stated that the power of monopolies is controlled by the consumer and his expectations, but it is strongly affected by price which is the main power of competition. He pointed out the effect of poverty (Boisguillbert, Malthus and others) and distribution on price, because a poor man cannot afford the goods, and "only in backward countries the rise of manufacturing is the primary objective". A research of Mills on inflation analysis limited the significance of investigation by discerning money market analysis from economics and price as well as manufacturing from distribution (Šalčius, 1991). The price theory requires an insight that in times of crisis the general level of prices drops, and in different range of goods prices rise unequally (Čiegis, 2006). In general, this is an effort to connect supply and demand through expectations, poverty and competition.

V. Jevons (1835–1882, "Theory of political economy", 1871) and L. Walras (1834–1910, "The elements of pure economic theory", 1874–1877) connected the level of market prices with the general and marginal usefulness of goods (Snieška et al., 2005, Čiegis, 2006), through which prices, monopolies and the amount of goods were related (Šalčius, 1991). Of the marginal use for a buyer are the following effects: a) the power that monopolies have to discern the price; b) the buyers' income and power to buy; c) the informativeness of a buyer. The informativeness of a buyer can be considered as a marginal usefulness, which is not useful to monopolies because the buyer increases the ability to bargain, i.e. to buy more and cheaper. It is paradoxical, but when the spending decreases, manufacturing, supply and technical progress decrease as well. That is why prices rise even more. Jevons stated that "one must command mutual information" (Čiegis, 2006), which in turn is obstructed by the imperfect competition; therefore, the marginal returns of production are decreasing (Marshall) and the prices rise. This type of price formation confirms the meaning of both hypotheses. It is understood that marginal usefulness (Šalčius, 1991) is the lowest when the marginal costs are the highest and depend on the prices of goods, while the latter ones depend on the costs of manufacturing (Čiegis, 2006).

Walras stated that the supply of manufacturing factors and demand for finished production have to be analysed through the function of price (Čiegis, 2006). He proved that "*the change in prices directly depends on the excess demand in view of supply*" and suggested, as Mills also did, to consider the general level and not separate levels of prices. In Walras' model, a) price determines demand; b) demand–supply; c) the price itself gives the maximum subjective benefit in terms of equal supply and demand. It is acknowledged that it is still unclear what determines the higher price in the model of Walras. It is also accepted that Walras' economic balance remains conditional, because it doesn't discuss profit and currency. It is obvious that Walras connected marginal usefulness with demand and economic balance, while Jevons did it with supply and monopolies. It is very important to the hypothesis that the price fluctuates when demand is higher than supply and the monopolies are interested in increasing prices, although the reason is not clear. The exploration of inflation is connected with the role of consumer (benefit), i.e. the effective demand of Keynes and the meaning of information, which Lucas acknowledged also.

Deep insights into inflation in the 19th century still left the same unsolved problems. Constant conflicts weren't encouraging to get deeper into the roots of this important subject, or maybe the time just was not right, so the necessity to connect goods, work and monetary markets arose (Martišius, 2005) while the inflation process was analysed within supply and demand.

An important breakpoint in terms of price formation could be considered R. K. Wicksell's (1851–1926, "Value, capital and rent...", 1893; "Interest of capital and prices of goods", 1898; "Lectures in political economy", 1906) concept in which there is an attempt to connect the problems of price, money and economic cycles (Snieška et al., 2005); he also related the research of marginal productivity with changes in capital percentage (Čiegis, 2006). His approach to prices and wages and to the importance of the stability of monetary spending was systemised by J. M. Keynes who distinguished the impact of spending on the growth of economy. R. K. Wicksell pointed out that the consistency of spending and prices has an impact on the balance of economic development and acknowledged that interest is a separate economic factor related to the amount of currency and inflation. In terms of demand, it was agreed that "monetary factors can create inequality between supply and demand, which determines changes in prices and disrupts the economic balance" (Snieška et al., 2005; Čiegis, 2006). Wicksell also integrated currency into Walras' scheme by adding the capital market to the manufacturing and goods market (Čiegis, 2006). He stressed that the fluctuation in currency has an effect on enterprises as well as on savings and investments, while the amount of currency affects decisions on consumerism and investments (Keynes). Differently than before (R. Cantillon, D. Hume), he linked money with prices per standard percentage. The bigger amount of money is thought to increase prices.

In the aspect of supply, he connected Mills distribution with marginal productivity because "*prices only match marginal utility only in effect with fair competition*". That is why real life has to be associated with the forms of "*unfair competition*" (A. Marshall, E. H. Chamberlin, J. Robinson), although free competition cannot fully satisfy the needs of citizens. Therefore, it is safe to state that imperfect competition limits the potentials of supply and demand in terms of ability to ensure stable prices. That is an important trait of Wicksell's price theory.

R. K. Wicksell identifies the importance of the first theory as well as partially reflects the problematic field of the second one. He must have been the first to acknowledge that the level of enterprise is directly dependent on inflation / deflation (value of money) and changes in interest rate. That is an important discovery for the theory of prices.

A. Marshall's (1842–1924, "Principles of political economy", 1890–1920 "Money, credit and commerce", 1923) and his students (Snieška et al., 2005; Čiegis, 2006) analysed theory of prices, which focuses on the economic balance, marginal value, amounts of money, income used in consumerism, pure competition and monopolies. Acknowledging functional analysis, he examined price, supply and demand together while being focused on the way those three aspects affect each other (Šalčius, 1991). It was established that through "*equilibrium price*" (Walras) one can analyse all economic processes of the market, while the economic balance "*is formed for one small reason – price*" (Snieška et al., 2005).

Price is being formed by demand within a short period which is decided by the psychological assessment of goods' value (Veblen), and "*any increase raises the price*", because "supply is more inert and cannot change as rapidly as the ever changing demand" (Čiegis, 2006), because manufacturing takes time to adapt. Prices can also increase because of the rising risk which is created by inflation of money (Šalčius, 1991). That is why, in a long-term period, supply and manufacturing costs become the main factor that determines the price (Čiegis, 2006). It is worth remembering that higher wages are exchanged for a better quality of a product, which in turn allows an increase in prices because of the higher selling quantities (Šalčius, 1991). The marginal gain depends on the development of technologies which, in the economy full of competition, just as do new methods of sales through a bigger supply, decrease the price. The longer the period of analysis, the more important the price of manufacturing in terms of constituting the prices. That is why marginal costs are so important to prices. It was well noted that because of this difference a quasirenta is gained – gain which is higher than the marginal gain of the company or the normal gain (Schumpeter). That is why monopolies are interested in a rapid and massive inflation.

Marshall also acknowledged the importance of monopolies and competition (Snieška et al., 2005) for the fluctuation of prices, because: a) supply and demand depend on price in terms of pure competition; b) the mechanism of pure competition guarantees economic growth; c) through price, all economic powers affect supply and demand, so,

$$\Delta Qgr = f(\Delta Q, P), \tag{1}$$

here ΔQgr is a change in pure competition, ΔP is a change in prices, and ΔQ is the economic growth.

The price in this model is the difference between nominal / monopoly and existing / competitive economics. The latter was described by A. Marshall as a pure (fair) competition. This comprehension of economics is not surprising to anyone nowadays.

It is important to the hypothesis that: a) when the price is higher than the balance margin, all supply increases, and if it is exceeded by supply the prices fall; b) monopolies control manufacturing and determine the prices which not necessarily reflect the limits of supply (Čiegis, 2006); c) that is why monopolies are not considered as part of the market but as a deviation from it (Snieška et al., 2005). It is not considered, however, that prices rise when supply is limited, and that supply is a point of interest for monopolies.

T.B. Veblen is referred to as the father of institutionalism (1857–1929, "Theory of business enterprise", 1904). He denied the model of economic balance while combining supply and demand (Čiegis, 2006), because he thought that big manufacturing companies are not interested in the rational functioning of the market and "*financial sectors are clearly interested in using financial institutions*" to increase their power. T.B. Veblen denied research of neoclassic balance of prices and urged to research it considering "*past and present*". He agreed, as did also Marshal, that changes in human behaviour may have an impact on changes of prices and be influenced by them. In this way, a doubt is created in the sphere of labour hypothesis as a psychological factor for inflation to be formed: when the market undergoes negatives changes because of decreased supply, the companies that use commercials, packaging or other tricks of market companies get more profit. This is known as the non-price competition, which is formed because of irrationality. T.B. Veblen understood that institutions have an impact on prices, but they are hard to change, so they don't follow today's requirements. He stated that technological development (production efficiency + low prices + efficient demand) is not advantageous for governmental institutions and major businessmen. It is agreed that public interest, knowledge and creativity built on the foundation of human values and cultural context can help various institutions and manufacturers to find new points of common interest, which would undoubtedly result in a more effective and cheaper manufacturing process.

As one can see, T.B. Veblen by dynamic supply means: a) technological development, b) creation of new institutions, c) increase in competition (rationality) which encourages to ensure lower prices allowing the economy to have characteristics of prediction dynamics.

The Quantity Theory of Money (1911), i.e. E. Fishers' (1876–1947) equation $MV / Q = P$ was produced; it reflects the dependence of inflation on changes in the demand or value of money in its amount (Šalčius, 1991):

$$P = MV / Q \, , \qquad (2);$$

here P is price; Q is the index of the real value of final expenditures (GDP), M is the total amount of money, and V is the velocity of money.

Since in monetary economy an increase in GDP (Q) is related to the amounts of money M, it is only natural that when these sizes are identical the velocity of money movement V is adequate to inflation. That is why this equation, if analysed separately from supply, does not cover all its potential. In that case, we should ask ourselves whether the change in prices reflects the ratio between demand and supply, or only of demand to demand. That is why the velocity of money movement (V) can be analysed in two ways – when it is lower and when it is higher than inflation. But when the M and Q values are similar, this cannot be done. Besides, Fishers' (Petty, Pigu et al.) proposal to increase indirect taxes instead of income tax (Čiegis, 2006), while the M and V values are not changing, means that the demand Q will decrease and the price P will increase, resulting in a reduced supply and income.

More competent monetarists have later agreed that currency regulates not only the prices, but also manufacturing, unemployment, interest-rate tendencies and changes in possible inflation (Snieška et al., 2005), while the circulation of money is functionally connected with the demand for money (Martišius, 2005). However, the important observation of the monetarist M. Friedman (1912–2006) that "as the amount of money increases so does inflation", not just the economy (Butautas, 2006, 2008), was neglected. That is why we had the 2008–2009 economic crisis in society. It is agreed that the main cause of inflation is the budget deficit and the amount of money in circulation, that the main problem of the economy is inflation and that economic equilibrium is more important than economic growth (Martišius, 2005). Essentially, this is a theory that analyses the reasons for demand inflation, stating that supply (manufacturing and employment), just like the market, regulates itself. Demand for money has to be analysed through the price and demand / supply relation. On the one hand, the monetarist origin of inflation confirms the importance of the main hypothesis; on the other hand, analysing demand separately from supply, low inflation cannot be achieved. The reason is that, in spite of public declarations, the authorities cannot seem to refrain from using the instruments of monetary and budget policy to reduce unemployment, although the budget deficit is acknowledged as the cause of inflation. That is why "the creator of political economy who cares more about unemployment than inflation doesn't reach his goal in lowering it but instead raises inflation, versus the creator of policy who gives priority to lowering inflation prior to lowering unemployment" (Kydland, Prescott, 2005). This means that a systematic money policy (Lucas, 1972, 1973) has no effect, because the related inflation expectations determine changes in price, which in turn eliminate the impact of that policy (Sargent, Wallace, 1975; Phelps, 2007). As one can see, the important objective of monetarists – low inflation – can only be achieved by connecting it with the problem of supply, which just confirms the importance of the second hypothesis.

E. Chamberlin (1899–1967, "Monopolistic competition", 1933) acknowledged the foundations of the second hypothesis because "monopolies mean that supply will be controlled, as well as prices" (Čiegis, 2006; Jaskelevičius, 2007). And "only when the monopolistic state is gone, monopolistic profit will be gone as well" (Šalčius, 1933). Meanwhile, this isn't possible in a purely competitive situation; this is why, when segments of suppliers come into conflict, price limits the amount of goods sold (Čiegis, 2006). These segments are overcome with a differentiation level of product through sale costs such as commercials, brand, packaging and others, which increases the elasticity of price and demand, but decrease supply, resulting in an increase of price. Therefore, it is agreed that demand is the size that can be influenced by a monopolist and that changes because of the manufacturer. The limited number of suppliers or cartel agreements (Šalčius, 1991) also limits the competition. In this case, differentiation loses its sole purpose, and the phenomenon of excess capacity comes into effect (Čiegis, 2006) because "manufacturing capabilities are not being used to their fullest potential". He has acknowledged that demand coincides with sales while supply does it with manufacturing costs. Meanwhile, not knowing the prices decreases elasticity. This means that the lack of information increases inflation and later even the unemployment. He has stated that when price remains static the quality of product can change. Neoclassical theory doesn't analyse this type of price changes. It was also effectively approved that increasing manufacturing increased fixed costs. Some economists (Šalčius, 1933) agree that at a bigger extent and lower costs, prices can remain stable or even fall.

J. Robinson (1903–1983, "The economic theory of imperfect competition", 1933) analysed pricing problems in the light of imperfect competition and noted that this type of economy experiences social and economic stress which results in a less effective manufacturing and a slower technological advancement. This could have been the reason for the scale of the Great Depression. He agreed that monopolies and manufacturers (Snieška et al., 2005) can destabilize all social–economic relations through prices (Čiegis, 2006), even though it wouldn't be their intent. That is why seeking for the perfect competition so that manufacturing elements would get an increase in profits is essential. If such an effect would occur, wages would be higher, even double. Because of the small amount of percent in capital, accumulation rates can make the economy go "into stagnation". Higher wages and lower prices would help to avoid that. Because of monopolies "in which there is little rivalry supervision" (Veblen, Chamberlin), discrimination of prices comes into light (Snieška et al., 2005) because marginal costs are ignored, so mark-ups can differ (Phelps, 2007; Winter) and different markets and segments in consideration of elasticity of demand get different prices (Chamberlin). This means that when consumer wages are high, this should be avoided, and surplus sale costs which increase price but should decrease it could be avoided as well. That is why, when there is not enough income to buy production (Malthus), an effort to influence the demand through people's behaviour, habits and other factors comes forth. This means that because of monopolies' activities (Čiegis, 2006), which "are in conflict with the laws of market", it is not only the supply (of employment) that suffers, but also the demand (income); according to Keynes, an increase in prices is also visible. P.A. Samuelson agreed that "*perfect competition means optimal choices*". It was agreed that imperfect and monopolistic competition theories are important while analysing prices, competition, economy forms and economic structure. Chamberlain and Robinson coloured in black and white the portrait of supply and demand inflation and thus gave it a deeper meaning.

J. M. Keynes (1883–1946, "The general theory of employment, interest and money", 1936) gives the following definition of inflation: *When the further growth of effective demand does not add to the extent of manufacturing growth and is only used to cover the growth of resource unit and progressing proportionally to the growth of demand, at the end of the day we reach a situation that we can call real inflation"* (Keynes, 1936). This means that when the supply exceeds the demand, the real inflation is formed, because the price depends on the ratio between the demand Q and the supply O (Keynes):

$$p = \Delta Q / \Delta O \quad (3)$$

here p is the price, ΔQ is change in the demand, and ΔO is change in supply.

Nowadays, this understanding of inflation surprises no one and confirms the priority of demand in inflation as well as the hypothesis. Keynes analyses supply costs through employment which has an impact on both supply and demand through wages, tendencies to consume and save. Businessmen increase employment but ignore effective demand, which is composed of expected consumption and investments that change only when the following factors change: a) tendency to consume; b) marginal effectiveness of capital, and c) interest rate. Only in this case the income will be lower than the costs of supply, and the business generates a loss. Meanwhile, the demand cost depends on the changing amount of money which affects the demand, and therefore the interest rates are changing as well. This means that supply depends on demand. To rephrase, supply cost depends on demand cost, which is affected by interest rates.

In the short run, if regulated or monopoly prices are ignored, price stability would be ensured by a stable wage, while the price level will change in such an amplitude that changes in employment will affect A. Marshall's *marginal manufacturing resources*. In the long run (Keynes, 1936), changes in prices are directly affected by technological advancements. This means that the money policy is not effective in the long run. So, when in the short run there is a stable wage policy, price stability will comply with the stable level of employment. In the long run two options are possible:

- to allow prices to decrease as the technological advance speeds up the means of production increase, maintaining wage stability,
- or to allow wages to increase while maintaining price stability.

Keynes approved the second choice because when wages increase, it is easier to maintain the level of employment than when the wages decrease. This is also connected with the technological advancement. Researches into price elasticity reveal that when economy is analysed separately from the currency market (classical economics), manufacturing and wage, which changes along the lines of inflation, are on different sides; however, when analysing them together, wages are no longer as significant for prices and essentially depend only on the amount of money in circulation (Keynes, 1936). Elasticity analysis, however, should be carefully considered.

In Keynes' price theory the most important factors are changes in employment, productivity, amount of money, GDP, manufacturing, investments and interest rates. It is of crucial importance that Keynes connects supply and demand with enterprise and points out how changes in interest affect prices.

P. Samuelson (1915–2009, "Foundations of economic analysis", 1947) continued Keynes' theory and pointed out that inflation in demand is formed when the amount of money increases and investments, government expenditures or pure export increase the demand and "shove" manufacturing coverage to the extent that it cannot handle

(Самуэльсон, Нордхаус, 2007). This means that supply, at least for a short period, is very limited. P. Samuelson also pointed out that the reduced unemployment, increasing labour shortage and rising wages caused by demand, accelerate the pace of inflation. This is why an increase in demand, results in a higher than balanced employment and manufacturing costs. This phenomenon is called supply inflation. In this way, the main hypothesis is acknowledged. P. Samuelson states that inflation can increase even if full employment is not reached (nearly 10 percent of unemployment) and even if the manufacturing resources are used to a full extent (Keynes). He also states that an increase in productivity and decreasing prices (deflation) can limit the general demand.

Supply inflation is affected by inertia of the internal process which is hard to stop, and even inert inflation can be impulsive. It is important that inflation would not go higher than 3 percent, to which it is important to adapt, because inflation doesn't remain stable for long (Самуэльсон, Нордхаус, 2007); that is why an effort to keep inflation below 3 percent (recommended 2.3–2.5 percent) is required. Besides, inflation has a mark that could limit its expectations. P. Samuelson has noted that the primary objective of credit – monetary policy – is a small inflation that could be predicted. Then inflation wouldn't be that damaging.

Inflation is affected by its initial tempo and trust (or vice versa) in economics, and sufficient employment can be achieved without inflation (Самуэльон, Нордхаус, 2007). These presumptions had an important impact on the rational expectations theory which states that clear rules and expectations can diminish the possibilities and inertia of inflation. P. Samuelson denied that controlling the currency exchange rate value is a stabilizing means because it imbalances the increase in GPD and decreases consumerism. He has also noted that while decreasing unemployment below the full employment rate, the extent of uncertainty increases and diminishes the temporary welfare.

He agreed that high inflation is related to a difficult macroeconomic situation and damages the growth of economy. As one can see, Samuelson's model of inflation refers to primary demand which moves supply processes, although they can be slowed down by the trust in a clear policy grounded on certain rules. One might say that this is a step forward towards connecting Keynesian and classical theories of inflation, i.e. connecting short-term and long-term periods into a whole. But is it successful?

Representatives of the Austrian school acknowledge that the origin of demand is connected with inflation. L. von Mises (1881–1973, "Currency and credit theory", 1912) recognized the dangers of credit expansion because a temporary boom and a fictitious wealth end up in a downfall or crisis. This is why the interest rates decrease more than they should to, and the habits of saving change (Čiegis, 2006). Businesses then invest more and often wrongly, and prices rise. L. von Mises also reveals an obvious link between inflation and currency, which is affected by the ever growing expenditures of the government. He also agreed that "inflation is politics" because creators of economy often think that “inflation is a better means to fill up the treasury than taxes”. They would not have such an impact on inflation if they were financed at increasing taxes.

The wrong decisions made by the demand policy often create damaging business cycles which, because of inflation, are much more dangerous, because resources are distributed wrongfully and because of the changed spending, supply and demand aren’t able to ascertain the real price (Čiegis, 2006). This is why the structure of the price is constantly changing. Because of this, the microeconomic importance of price is acknowledged. A very important statement is that “different groups of population are affected by inflation differently as well”. This means that poverty is another cause of inflation, and the demand policy is ineffective.

This is why F. A. Von Hayek (1889–1992, “Prices and manufacturing”, 1976) in the aspect of demand agreed that inflation is caused by a meagre control of currency (Čiegis, 2006) which is important to employment and investments, i.e. to supply while time (inertia) is taken into account. He understood that the inadequate correlation between profit and interest rates can have an impact on price changes because when profits are higher than interest rates, investments and prices increase, and if the two were decreasing a deflation would take place. This means that stable interest rates are very important. It is important that he understood how dependent on inflation are the structures of capital, manufacturing and consumption and how they change along with inflation, which “has the ability to register even the smallest changes in the environment” “to the extent of whole society”. This is why information, or rather the lack of it, can be considered as one of the sources of inflation, while the right rules (Čiegis, 2006) that protect from ignorance can be interpreted by clear, rational rules. Von Hayek acknowledges the weight of both hypotheses because the most important aspects of a right market are prices and competition. Which one is more important is “left to be discovered”.

When the monetary economy is depleted in terms of demand, theory of rational expectations agrees that only short-term fluctuations in unemployment can be caused by monetary, fiscal or political means. Later, when the lower than balanced unemployment level is reached, inflation constantly increases. Keeping in mind that employment reflects manufacturing and currency and/or fiscal policy, i.e. demand, it is obvious that demand is considered more important than supply. It has been stated (Prescott, Kydland, 2005) that the more expansive money policy and higher inflation is expected by the companies, the higher prices and wages are established. Thus, supply reacts to demand changes through expectations. It is acknowledged that unemployment increases when real wages are increasing, although it is forgotten that wages are a factor of demand. This means that if one solves the problem of ineffective demand, inflation has to be analysed as a process of supply. This is completely similar to the definition of inflation: *to keep the general demand high enough so that unemployment would be low, but not too low so that a surplus employment and inflation wouldn’t occur*. So, this means that demand is a source of inflation.

In the aspect of supply, it is acknowledged that in the modern model of macroeconomics, shocks of supply are as important as shocks of demand. Technological advancement is important for price, and technological shocks have to be considered a serious reason for the formation of business cycles. It was also understood that the means of supply can limit the ineffective decisions of demand because the behaviour predicated by principles of macroeconomics is more resistant to political means to increase demand.

These statements prove that only by manipulating the factors of demand or the amounts of money (Keynes, 1936), neither higher employment nor lower inflation, nor lower than standard interest rates will be achieved. As one can see, the rational expectations theory agrees with the main hypothesis and gives a broad spectrum of the ways to solve supply inflation, to limit ineffective decisions of demand, although the analysis of competition and monopolies is still missing.

Delayed demand when goods made yesterday are used today and today's tomorrow covers three factors – delayed demand, delayed investments, and inadequate supply (Bubnys, 1991).

It is agreed that when income increases, consumption decreases, and vice versa. A more effective allocation of income (Mill) would increase the tendency to buy as well as investments (Keynes) and accumulate capital. An increase in prices affects the tendency to buy in two ways (Keynes, 1936): a) when supply is low – consumption increases and the postponed demand decreases; b) while prices increase and there is an overflow of them or competetive goods (Bubnys, 1991) consumption decreases, so the delayed demand increases while other conditions remain the same. According to S. Kuznets, the tendency to consume is higher (c = 0.86) than according to Keynes (c = 0.73) because of the different time period. The fact that consumption is higher but not absolute proves that the above statements are true (Snieška et al., 2006).

When the prices and interest rate increase, people tend to invest less (Aleknevičienė, 2005; Snieška et al., 2006), so it is obvious that consumption goes prior to investments, or demand to supply. As savings depend on interest rates (Snieška et al., 2006) and the latter on inflation (although there are those who think otherwise), there is an obvious influence of price on the growing supply. Researches in the EU have proven that. Decreased investments will increase work costs, decrease productivity and influence increase in price in future. That is why Keynes stressed the necessity of stable prices and interest. While the prices increase, consumption along with spending (Snieška et al., 2005) decrease, and investments turn into disinvestments because consumed goods have been produced earlier, while the present manufacturing supplies the future consumption (Keynes, 1936). This is why the renewal of manufacturing slows down (Snieška et al., 2005) as does also the need for capital. This bond lasts long (Hicks, 2003). According to the Solow–Swan model, "the accumulation of capital and technological advances decide the rise in production and consumption". On the other hand, this contradicts the opinion that by further taxing the capital, consumption could be increased even today (Phelps,

2007) because there would be no sense in accumulating it. Wicksell (Čiegis, 2006) has stated that the accumulation of capital tends to turn into reserve. In the Solow–Swan model, capital is saved for investments while technologies, with the help of employment, decrease manufacturing costs.

As one can see, the link between postponed demand and inflation is multi-staged and often indirect, but mutual. So far, a hypothetical link between corruption and monopolies can be seen. It is obvious that the postponed demand, through changes in price, in a close junction between supply and demand, exerts direct and indirect effects on economic growth and the well-being of people. However, this phenomenon needs more detailed research.

Conclusions

1. A review of the scientific literature has fully confirmed the main hypothesis that demand is the primary source of inflation because an ineffective inflationary demand increases the manufacturing cost but not the manufacturing volume. Recognition of this fact is crucial for a successful comprehensive economic knowledge and development. Ignoring the importance of dynamic demand for inflation, we lose any motivation and the possibility to further analyse the broad opportunities that supply can offer to make production cheaper. Therefore, the deflationary economic recession will be stronger.
2. Inflation theories concerning supply and demand do not oppose each other but actually complement each other successfully. When the problem of ineffective demand is solved, inflation management can be analysed in terms of the abundant opportunities offered by supply. A rise in supply price can maintain a one-off character if it does not shift into the stage of inertia – something the avoidance of which requires all available information.
3. The investigated scientific literature shows that it is characteristic of imperfect markets to give society incomplete information; hence, monopolistic behaviour arises, increasing demand and decreasing supply in a short term and causing a strong dispersion of prices. That is why, because of the fluctuation of money value, some additional risk, and changes in the structure of prices and manufacturing appear. Therefore, harmful business cycles constantly take shape because of the inflationary policy. So, the capital can even totally depreciate and lower the entrepreneurship.
4. The monopolistic (oligopolistic) elements in an economy are interested in human and social progress. That is why determined steps are required to free the economy from any excessive tendency toward such a selfish state which does not ensure greater common good, human dignity and thus freedom. For this to happen, good examples as well as more sincere investments into human and social progress are needed. Limiting the power of monopolies and serving institutions would create

more space for supply measures to develop, opening the way for countries' economies toward cheaper production and greater solidarity.
5. The study has shown that poverty undoubtedly reflects poor competition and technological development and thus increases prices and decreases marginal productivity. Poverty should be acknowledged as an important source of inflation, weakening investments, the base of employment and human competencies. Therefore, measures must be taken to minimize poverty as well as social and economic disjuncture.
6. Still much remains to be researched regarding the link between delayed demand and inflation. Further investigations and deeper, more detailed studies could help us understand why and when both wages and prices, as well as the stock of goods increase.
7. The study has revealed an obvious interrelation of the independent economic factor and interest rate; that is why a dynamic economic equilibrium, which accelerates changes, could have a decisive influence on economic recession.
8. The data and conclusions of this modest paper could be used for developing a more constructive and comprehensive information for further research.

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