

## CHARACTERISTICS OF THE CURVES OF AGGREGATED DEMAND AND OFFER IN COMPETITION ECONOMY

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**ABSTRACT.** Aggregated demand and aggregated offer are fundamental concepts of macroeconomic theory and decisive elements of the analysis of the goods and services production, of inflation and economic growth as well as of elaborating economic policy. As fundamental variables of concurrent market, aggregated demand and offer and their interdependence determine both the balance level of the general index of prices and the balance level of national production. This paper focuses upon a series of characteristics of the correlation between aggregated demand and aggregated offer having significant consequences. Among them one can notice the following: aggregated demand does not change while aggregated offer increases – the offer's curve moves towards right, the general index of prices decreases, the balance quantities of demand and offer increase; aggregated demand does not change while aggregated offer decreases – the general index of prices increases, balance quantities decrease, the prices of production factors increase and costs grow; aggregated offer is constant – the general level of prices and of the real gross national product is lower, people buy and invest less, government's expenditures for goods and services increase. In order to grasp and demonstrate all these phenomena we have proposed the use of certain graphic representations of the curves of aggregated demand and offer, of Phillips curves, and of IS curves.

### ХАРАКТЕРИСТИКИ НА КРИВИТЕ НА ТЪРСЕНЕТО И ПРЕДЛАГАНЕТО ПРИ КОНКУРЕНТНА ИКОНОМИКА

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**РЕЗЮМЕ:** Търсенето и предлагането са основни понятия в макроикономиката и имат решаващо значение при анализа на стоки и услуги, инфлация и икономически растеж. Като основни променливи на пазара, търсенето и предлагането и тяхната взаимна връзка балансират нивото на цените и националния продукт. Статията фокусира своето внимание върху корелационните характеристики между търсене и предлагане и последиците от това. С интерес може да се наблюдава следното: търсенето не се променя с увеличаване на предлагането-кривата на предлагането се движи надясно, общият индекс на цените пада, балансиращите количества на търсене и предлагане нарастват; търсенето не се променя при намаляване на предлагането-общият ценови индекс расте, балансиращите количества намаляват, цените на производствените фактори растат, а оттам и общите разходи; предлагането е постоянно-общото ниво на цените и брутният вътрешен продукт е по-нисък, хората купуват и инвестират по-малко, разходите на правителството за стоки и услуги нарастват. В графичен план са представени кривите на PHILLIPS и IS кривите с цел демонстриране на тези явления.

### Aggregated demand

Generally, *aggregated demand* represents a complete relation displaying function characteristics, between the general levels of the prices and the levels of the demanded amounts of goods and investments in a society. The demanded amounts of goods and services also include the goods demanded by the government; accordingly, we may state that aggregated demand is a relation between the general levels of the prices and the levels of the real income or of the production demanded by society. The level of aggregated demand, in case of a given level of prices, is displayed by IS-LM model implying that the producers offer the amount of goods and services they can retail on the market; this amount is given by the balance real income that is situated at the intersection point of IS and LM curves.

*IS curve* represents the whole range of the combinations of interest's rate ( $i$ ) and of income ( $y$ ) that provide the balance of the goods and services market. It is represented as a descending relation between ( $i$ ) and ( $y$ ) ( $I$  = investment;  $S$  = saving).

*LM curve* represents the whole range of the combinations of ( $i$ ) and ( $y$ ) that provides the balance on monetary market. It is

represented as an ascending relation between ( $i$ ) and ( $y$ ) ( $L$  = monetary demand;  $M$  – monetary offer). Accordingly, the IS-LM model offers demanded production at a given price and is able to show what the production demanded at a different level of prices could be; it also can show the displaying of a curve of aggregated demand that matches demanded production and the general level of prices. In conclusion, *the curve of aggregated demand* (Genereux, J., 2000) offers the whole range of combinations of the real income ( $y$ ) and of the general level of prices ( $P$ ) for which the market of goods and services (IS) and monetary market (LM) are simultaneously in balance. In order to give a sample and to explain the reasons of the movement towards one direction or another of the curve of aggregated demand we use the graphic in figure 1.

Abbreviations' signification:  $P$  = the general level of prices;  $y$  = income;  $LM$  = LM curve;  $IS$  = IS curve. The figure displays the curve of aggregated demand as a function type relation between real income ( $y$ ) and price ( $P$ ), starting from the fact that the change of the amount of real money offered by monetary authority modifies LM curve. Accordingly, in case of variant a) of the graphic, the decrease of the general level of prices from  $P_1$  to  $P_2$ , determines the movement of LM curve from  $LM_1$  to  $LM_2$  and the increase of the balance income from

$y_1$  to  $y_2$ ; in case of variant b) of the graphic, we have displayed the pairs  $P, y$ , identified by variant a) the union of whose results in the curve of aggregated demand. Consequently, one can notice the following: any factor, except  $P$  and  $y$ , that moves the curves  $IS$  and  $LM$  also moves the curve of aggregated demand; the inclination of the curve of aggregated demand directly depends on the inclination of  $IS$  curve. In other words, the more investments react when interest's rate change the more the amount of consumer goods and investments demanded by society reacts when the general level of prices

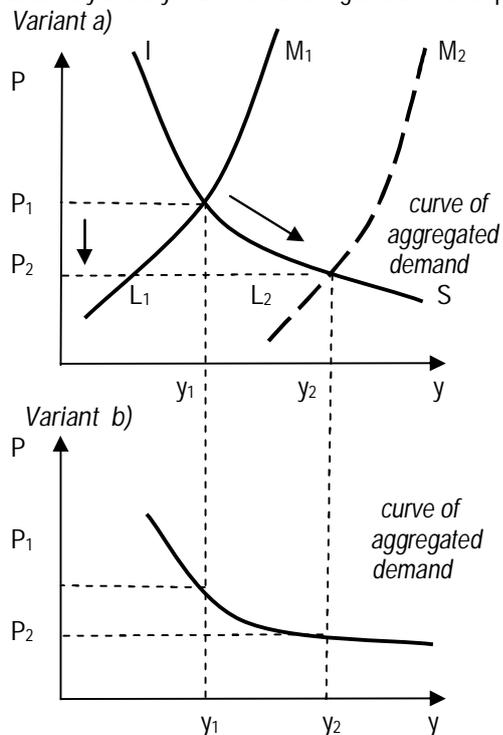


Fig. 1. Displaying of the curve of aggregated demand

changes. The negative inclination of the curve of aggregated demand relies upon the following aspects: (Barbaciou, C., 2001): the first aspect is connected with the so-called *Pigou effect* or *the effect of real rest* – when the general level of prices decreases, the existent amount of money being known; the buying capacity of money increases, and society demands more consumer goods and investments; the consequence is inversed in case the general index of prices increases; the second aspect is connected with the so-called *Keynes effect* or *the effect of the interest rate* – when the general level of prices decreases the buying capacity of money increases; the consequence is the diminishing of the amount of money necessary to finance the same investment projects; consequently, credits demand decreases and interest rate diminishes, a fact that determines the increase of the required amounts of investment goods and long-term consumer goods; the third aspect is connected with the *Mundell-Fleming effect* or *the effect of the exchange rate* – currency exchange rate decreases when the decrease of the general index of prices determines the diminishing of the interest rate; the consequence is net exports stimulation and the increase of the demanded amount of goods and services.

Generally, economy's total expenditures diminish when the level of prices increases, the other factors remaining unchanged. Nevertheless, these factors tend to change

determining modifications of aggregated demand. Starting from this fact, one is entitled to question the subject of those variables that determine the movements of aggregated demand. With this in view, it is compulsory to divide the determining factors of aggregated demand into two categories (Samuelson, A. P., 2000): the first category is expressed by *economic policy variables* that are controlled by the government, namely *monetary policies* which represent the measures owing to which the central bank can influence the size of monetary mass and other financial terms, as well as fiscal policy through taxes and government expenditures. Government policies emphasize the manner the State can influence the various components of aggregated demand; the second category is represented by *exogenous variables* such as: external production, the value of assets, the progress in the field of technique, political events, etc.; they determine important changes of the structure of aggregated demand. The position of aggregated demand depends on the position of  $IS$  and  $LM$  curves as aggregated demand is determined by the  $IS - LM$  balance. Accordingly,  $IS$  curve moves towards right as a result of the increase of public expenditures, the variation of the balance real income being the same whatever the general level of the prices it compares to is.  $LM$  curve moves towards right as a result of an expansionist monetary policy that moves towards the same direction; the demand increases irrespective of the level of prices.

According to the data below, the following conclusion can be extracted: *any movement of  $IS$  and  $LM$  curves determines a movement of aggregated demand towards the same direction, and the factors that determine the position of aggregated demand are the same as those that also determine the position of  $IS$  and  $LM$  curves.* Consequently, the curve of aggregated demand moves towards right under the following circumstances: when public expenditures increase; when money offer increases; when national money depreciates; when taxes decrease; when autonomous consumption increases.

Economic theory employs *multiplicator's model* that explains the forming mechanism of aggregated demand, effectively displaying the manner consumption, investments, and other variables interact in order to determine aggregated demand. This model starts from the hypothesis that prices and salaries are considered to be unchanged on a short term so that all adjustments to economic shocks and policies are made owing to production and labor employment. Such a hypothesis represents an eloquent approximation for shorter periods of time; yet, on a long term, one should notice the reactions of prices and salaries determined by the evolution of aggregated demand and the modification of potential production and of production costs. In the case of the simplified model of the Keynesian multiplier, production is determined by investments while savings do not react when facing the income's changes. Accordingly, production increases or decreases until the moment when planned savings reach the level of planned investments. Investments have as a consequence a multiplying effect upon production. In case investments change, production first increases with a value that is equal with supplemental investment; nevertheless as the beneficiaries of the incomes in the fields producing capital goods get higher incomes a whole chain of employment and of consumption secondary supplemental expenditures starts.

The researches upon the curve of aggregated demand emphasize the existence of the difference between the curve of micro-economic demand and the curve of macro-economic demand. Consequently, the macro-economic curves of aggregated demand differ from micro-economic ones as macro-economic curve shows the changes of prices and production at the level of the entire economy while micro-economic curve shows the behavior of a good or service. Subsequently, the curve of aggregated demand is mainly a descending one due to the monetary mass effect while micro-economic curve is descending as a result of the substitution effect when the incomes and the prices of the other goods are considered to be unchanged.

## Aggregated offer

*Aggregated offer* mainly represents a function type complete relation between the general levels of prices and the levels of consumer goods and investments production offered to a society. The understanding of the hypotheses that are the basis of the representation of the curve of aggregated offer implies the emphasizing of certain aspects of the building of a branch offer curve, namely: the offer's curve of a branch has a positive inclination as margin cost is an ascending one and the higher price of the good means at the same time a relatively lower price as compared with the price of the other goods; in case we suppose that the productive factors existing at the level of the branch are completely used, the increase of a good's price can determine a higher production only when resources from other branches are attracted. Regarding these two situations, the curve of aggregated offer has the following significations: a) a sum of offer's curves of all the companies existing in a society having a positive inclination; under such circumstances, the increase of the general level of prices does not require a relative change of the prices too; consequently, the increase of the price of a product does not mean a relatively higher price as such an increase is accompanied by the simultaneous increase of production factors; under such circumstances, a general higher level of prices does not allow the covering of higher margin costs; accordingly, the curve of aggregated demand with a positive inclination has as a basis the short term existence of the so-called *phenomenon of monetary illusion* (Fudulu, P., 1997), according to which, within the phenomenon of the increase of the general level of prices, producers perceive the increase of the prices of the goods they offer but they do not perceive the increase of the prices of the goods they buy, and b) an increase of the prices can be accompanied by the increase of the production factors offered only in case they are not already completely engaged as the curve of aggregated demand is represented at the level of all the branches of a national economy. As a conclusion, *the curve of aggregated offer emphasizes the global amount of the goods and services national producers are willing to offer as compared with each general level of the prices.*

Starting from the displayed data, we can state the following: the curve of aggregated offer has various time depending forms. Consequently, there is a *graphic of the curve of short term aggregated offer* represented by a descending curve where high prices are associated with the increase of the production of goods and services, and a *graphic of long term*

*aggregated offer* that is represented by a vertical straight line that shows the fact that the increase of the prices can determine the increase of the total manufactured production. The curve of short term aggregated offer is graphically displayed in figure 2.

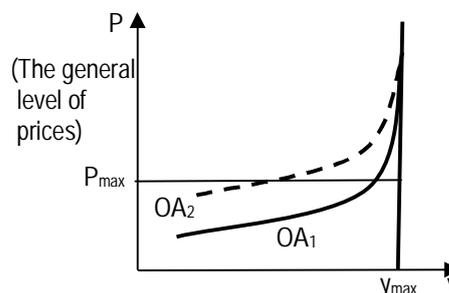


Fig. 2. The curve of short term aggregated offer

Under such circumstances, the increase of the general level of prices attracts unused resources and production increases. The prices witness an increasing rhythm as accordingly the progressive decrease of available resources and their decreasing efficiency are suggested. Consequently, the curve of aggregated offer is represented by a straight line segment when resources are totally attracted and exploited.

The curve of short term aggregated offer moves towards NV as a result of diminishing the amount of production factors (the curve of aggregated offer moves from OA<sub>1</sub> towards OA<sub>2</sub>). One can accordingly notice that the vertical straight line segment remains unchanged. The increase of short term aggregated offer or its moving towards SE effectively takes place after remaking the amount of productive factors that follow the decrease of their amount.

Macro-economists have formulated a series of theories regarding the increase of short term aggregated offer; they differ from one another in details but have a common theme. The representatives of *Keynesian School* state that, on a short term, the curve of aggregated offer is relatively flat. Accordingly, the changes that appear within aggregated demand have a significant and long-lasting effect upon production. According to this conception, prices and values are short term flexible due to the rigidity of contracts. According to Keynesian conception, economy can pass through long periods of unemployment; salaries and prices slowly react to shocks, and the re-establishing of the balance through a maximum labor employment is also slow. The representatives of the *classical school* have emphasized the influence of self-correcting forces that operate owing to the prices mechanism. According to this conception, economic cycles either do not determine losses or involuntary unemployment or they are quite small, and the administration policies of aggregated demand have a reduced impact upon production and labor employment. They also state that the graphic of aggregated offer is represented by a quite inclined curve or even by a vertical straight line; consequently, the changes within aggregated demand have a low effect upon production.

The curve of long term aggregated offer is graphically represented by figure 3. As one can notice, the curve of long term aggregated offer is represented by a straight line abscise perpendicular, completely independent of the general level of prices. We can figure out that, on a long term, the resources

existent in a society are offered in order to be engaged at an optimum level or at a level desired by their owners; the phenomenon of monetary illusion is absent; as a result production does not change when prices change. The increase of aggregated offer or the movement of the curve of aggregated offer from  $OA_{11}$  to  $OA_{12}$  occurs as population and the capital society owns increase; such circumstances do not necessarily imply a certain change of the general index of prices.

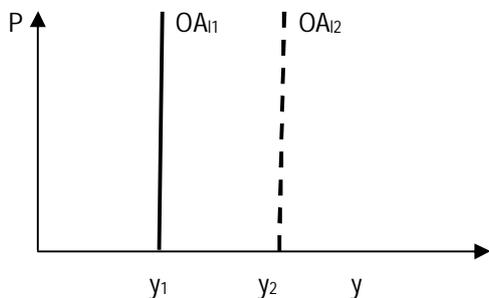


Fig. 3. The curve of long term aggregated offer

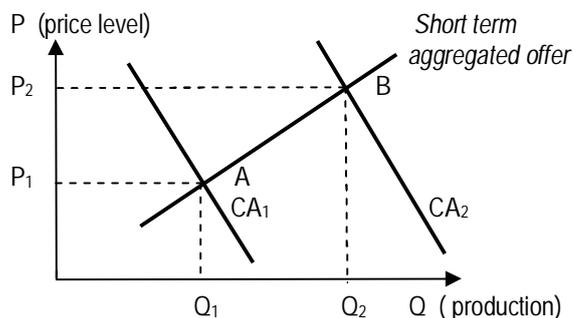
After analyzing the two concepts a series of questions emerge; they regard: a) the behavior of short term aggregated offer and its differences when compared with the long term behavior; b) the motivation of the companies that make them increase the prices and the short term production when aggregated demand increases; c) prices change but not production change on a long term when aggregated demand increases. The answer to such questions is to be found, in our opinion, in the manner salaries and prices are determined in a modern market economy. Certain cost elements are inflexible and rigid on a short term, a fact that determines the companies to react when aggregated demand increases implying the manufacturing and offer of a larger production. Companies consider that it is more profitable to increase prices and to offer a larger production amount when aggregated demand increases as certain elements of the costs are constant on a short term. Among inflexible or rigid costs, the most significant are salaries; they slowly adapt to the economic environment. On a long term, cost's inflexible or rigid elements (salary contracts and rent contracts) make negotiable and settled prices flexible.

### The correlations among aggregated demand, aggregated offer and Phillips curves

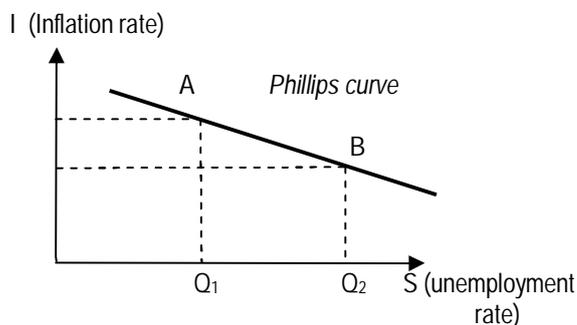
The evolution of inflation economic theory has been influenced by the appearance of the model of Phillips curve. Lately, inflationist and unemployment processes increasingly interfere and have unexpected effects. The relation between inflation and unemployment is emphasized owing to Phillips curve which is quite useful in macroeconomic analyses. Phillips demonstrates the existence of an inverse relation between the yearly inflation rate determined by salary increases and unemployment rate. Such a curve emphasizes various combinations of inflation and unemployment that grow on a short term, as the movements of the curve of aggregated demand moves economy along short term aggregated offer. The level of the previous year price is known so that the

increase of the current year price level implies the increase of aggregated demand, moving economy along Phillips curve to a point where unemployment is lower and inflation is higher. In order to visualize such aspects the graphic representations in figure 4 are employed.

One may notice that in case goods' aggregated demand is relatively low, economic results are to be found in point A; in case aggregated demand is relatively high, economic results are to be found in point B. In other words, the increase of aggregated demand moves economy towards a balance point with higher production and higher level of prices. At the same time, as a result of the fact that more employees are needed when production increases, unemployment is lower in point B than in point A. Inflation's rate is higher as the price level is higher in point B than in point A. Accordingly, one can compare the two possible economic results both in terms of production and price level and in terms of unemployment and inflation.



a) Model of aggregated demand and offer



b) Phillips curve

Fig. 4. Relation among aggregated demand and offer and Phillips curve

According to the above data we can state that *Phillips curve represents an empiric relation that reflects salary's and inflation's behavior as compared with unemployment rate – the higher unemployment rate the lower inflation rate*. We are going to draw out the following conclusions (Begg, D., 1991): Phillips curve should not be permanently seen as an option between inflation and unemployment (it is more adequate to appreciate it as a temporary option when economy adapts to a shock of aggregated demand); the speed economy moves along Phillips curve with depends on the flexibility degree of salaries and prices. The empiric relation established by Phillips between the rate of salaries changes and unemployment rate, besides a theoretical basis, has been considered "quantification with out theory" (Crozet, Y., 1995).

Phillips original curve (Drobota, N., 1999) has emphasized the static relation between nominal salaries and unemployment while the modified curve indicates the option between inflation and unemployment. This curve can be employed by stabilizing policies that allow the administrators in the field the selection of the policy that provides an optimum combination between inflation and unemployment. R.G. Lipsey has been the one who theoretically interpreted Phillips curve in the context of the demand and offer manifesting on a unique labor market. According to him, inflation can be explained owing to the excess of demand on labor market, unemployment rate being considered as an index of the level of exceeding demand. Another interpretation of Phillips curve has been done by P. Samuelson and R. Solow (Babaita, I., 2003); they consider that it can be employed in order to choose an economic policy having the following connotations: a) the change of Phillips curve in a manner that it represents a relation between inflation rate and unemployment rate, and not between the rate of salary variation and unemployment rate, and b) the recommendation of Phillips curve as an instrument that is capable to allow authorities the drawing out of certain political programs implying alternative combinations of unemployment and inflation rates. Accordingly, *each point on Phillips curve can be interpreted as a possible variant of economic policy. All along this curve an inversely proportional relation manifests between unemployment rate and inflation rate; this fact shows that a lower inflation can be attained in exchange of a higher unemployment; in case they consider that unemployment rate is high they can try to reduce it owing to a policy of stimulating demand such as the increase of budget deficit financed through increasing monetary mass.*

Phillips curve raised a high interest when the controversies between the supporters of the neo-Keynesian theory and those of monetarist neo-liberalism have started regarding the part of fiscal policy and of monetary policy in regulating economy; at the time they have revealed the limits of the conception that represented the basis of that curve. In R.G. Lipsey's conception, Phillips curve represents a short term relation as it describes salaries, inflation, and unemployment during the process of adjusting them to past inflation. On a long term, he has showed that unemployment rate is independent of inflation rate, that Phillips curve is vertical, and that its position is determined by unemployment's natural rate as figure 5 displays it. Accordingly, curves  $CF_{sa}$ ,  $CF_{sb}$ ,  $CF_{sc}$ , show various forms of Phillips curve on a short term while curve  $CF_l$  represents the long term evolution.

The difference between Phillips short term and long term curves is explained owing to the concept of inflationist expectations whose changes move these curves determining direct implications upon monetary and fiscal policies.

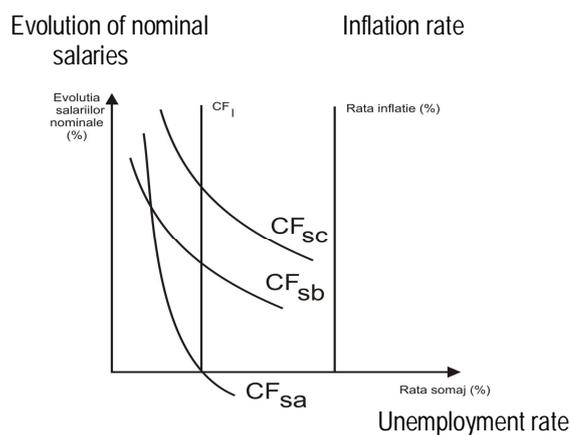


Fig. 5. Phillips short term and long term curve according to R.G. Lipsey

This difference has been noticed by M. Friedman and E. Phelps whose theory is known as the *hypothesis of unemployment's natural rate*; they state that unemployment rate can deviate from its short term balance level, but that, on a long term, it will return to its natural value as a result of an adjustment to inflationist expectations. M. Friedman has shown that there is no choice between short term unemployment and inflation; they cannot provide a permanent low level of unemployment through accepting a high rate of inflation. In approaching the model of Phillips curve and inflation monetarist theory one can employ the notion of adjustable expectations; they represent psychological phenomena that cannot be directly surveyed from the point of view of their amount although they determine the behavior of companies. In the absence of expectations, monetary expansion determines the increase of the demand of goods and services which at its turn implies a general increase of the prices. The tendency of real salaries decrease is also manifest as well as the tendency of diminishing labor demand as nominal salaries witness an inferior evolution rhythm. The unemployed do not include past inflation among their expectations; they suppose prices are going to be adjusted the following year and are consequently ready to work in exchange of unchanged nominal salaries; as a result unemployment decreases. M. Friedman has also explained the fact that the option between a higher inflation and a lower unemployment is valid only in case individuals do not look to formulate expectations regarding future inflation or when their expectations are false. When employees include last year inflation among their expectations regarding next year inflation they either abandon their jobs or negotiate higher nominal salaries. Under such circumstances, unemployment returns to its initial level but to a new inflation rate; these aspects are displayed by figure 6. Accordingly, curve  $CF_{sa}$  moves to  $CF_{sb}$ , as economy moves from B to C. Under the influence of the economic policy subsequent movements of Phillips curve and of economy are going to be registered. As inflation rate is used as a basis for expectations, the perspective of certain lower real salaries determines unemployment decrease. On a short term, the curve is going to move to  $CF_{sc}$  as economy moves from D to E.

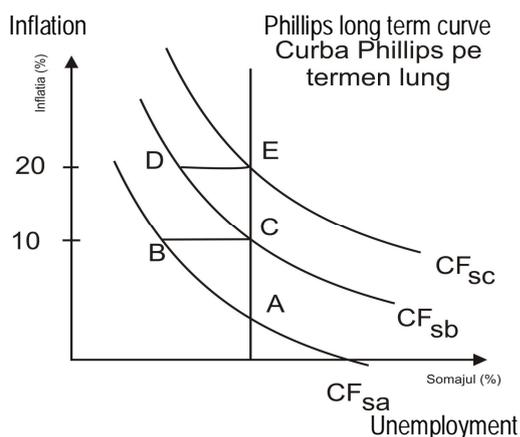


Fig. 6. Phillips short and long term curve according to M. Friedman

In our opinion the following conclusion can be extracted: *on a long term there is no option between unemployment and inflation; under such circumstances Phillips curve is vertical and it results after uniting the points to which economy returns after each expansionist phase (points A, C and E in figure 6).*

The long term vertical curve shows the hypothesis of natural rate. Unemployment's natural rate corresponds to whatever value of inflation rate on condition that it has been fully anticipated. When owing to economic policy measures they target to place unemployment rate under its natural level then inflation rate is going to grow over the anticipated level and short term compensation between unemployment rate and inflation non-anticipated rate is registered. The administrators in the field of economic policies will be able to avoid the acceleration or decrease of inflation only through administrating global demand so that it allows the maintaining of unemployment on its natural level. The formulation of the hypothesis of the natural rate has helped the significant diminishing of the object of monetary and fiscal policies.

Phillips curve employed nowadays is different from the initial one regarding the following aspects: inclusion of the index of offer's shock changes; replacement of the rhythms of yearly change of the nominal average salary by inflation rates; inclusion of the index of inflation's expected rhythms. Accordingly, Phillips curve has become an instrument of laying the foundations of the policy of economic offer, being an

alternative of representing global offer owing to which one can substantiate the option between inflation and unemployment whose conditions are given by the curve of global offer. Owing to Phillips curve one can state that the level of inflation measured through changing the prices as compared with the previous period depends on a series of factors such as: offer's shock changes, expected inflation, and unemployment's deviations from its natural level (cyclic unemployment). We consider that, according to the above data, the following conclusion can be stated: *Phillips curve is a convenient manner of representing and analyzing global offer and, at the same time, the curve of global offer can be used in order to model inflation.* Within macro-economic models, Phillips curve holds a distinct position; it has sometimes been combined with IS-LM model adding to the goods and services market monetary market, labor market, the determination of unemployment and inflation rates and accordingly creating the necessary framework for the analysis of lack of balance situations.

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