

# AGGREGATE SUPPLY AND DEMAND, FUNDAMENTAL VARIABLES OF THE MACROECONOMIC PREDICITON

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**Abstract:** The macroeconomic prediction has extremely important, complex and difficult objectives in a competitive economy and that is due to a multitude of reasons. In this context, we estimated the fact that a key-role can be attribute to the anticipation and the projection of some essential balances of the development, process which is at the basis of the prospective study of the behaviors of the aggregate demand and offer – the concepts and the variables with the highest degree of generalization from the study of the economy and not only. We started in our study, from the analytical basics of the aggregate demand and offer, we pointed out the dependence of the production and of the prices on the interaction of the aggregate demand and offer, we used as working instruments the curves of the aggregate demand and supply and we outlines the consequences of the variation of the two sized under different circumstances.

The behavior of the aggregate demand and supply, on a short, medium and long term offer precious information for the anticipation and projection of some essential balances of the development. We consider the following problems to be important:

## 1. The analytical basics of the aggregate demand

The aggregate demand represents the total of the production, respectively the planned expenses for all the sectors at a given price level, the other factors being constant.

Consequently, its component elements are the following:

**a) Consumption** – mainly determined by the available income (the personal income diminished because of the taxes), mentioning that it is also influenced by other factors. The prospective analysis of the aggregate is concentrated on the real consumption ( the nominal consumption reported to the index of the consumption prices);

**b) Investments** (private acquisitions of buildings and equipments and the stock accumulation) determined by the level of the production, the capital cost and the expectations regarding the future. The main instruments to influence them through the economic policy are the monetary policy;

**c) Governmental acquisition of goods and services** – determined directly and adopted by the government, regarding for example the acquisition of equipment and devices for railways and of services carried out by judges and professors in public schools;

**d) Net exports** – are equal with the difference between the exports and imports. The imports are determined by the internal income and production, by the relation between the internal and the external levels and the foreign exchange course of the national currency. The exports (imports for other countries) are determined by the external incomes and expenses of the country, the relative prices and the foreign exchange course. All the above mentioned factors also influence the net exports [Samuelson Paul, Nordhaus William, 2000].

## 2. The basics of the aggregate supply

The aggregate supply reflects the behavior of the productive sector of the economy. Its curve is a graphic which points out the evolution of the gross domestic product (GDP) or of the gross national product (GNP) according to the level of the price, the other functions remaining unchanged.

The determining factors of the aggregate supply are:

**a)** *The potential production*, respectively the capacity of the economy to produce – represents the maximum quantity of goods which can be obtained by the means of technology, managerial aptitudes, capital and labor and other available resources at a given moment.

The long run aggregate supply is influenced by the same factors which influence the economic growth, respectively the quantity and the quality of the available labor force, the number of production equipment and devices used by workers, the technology level, etc. The long run prospective analysis of the direction of the growth process on a long term refer both to the increase of the potential production, and to the factors which determine the aggregate offer.

For quantitative purposes, the potential GDP is considered to the maximum level which can be accomplished by the potential production. It is generally considered that the potential GDP is the equivalent of the production which could be accomplished under the circumstances of unemployment at a minimum reference frame (the natural unemployment rate).

The potential production mainly represents the quantity of goods which could be accomplished if the aggregate demand would constantly grow, and the aggregate demand would not suffer shocks. This corresponds to a certain point from the curve of the aggregate offer. But due to the shocks produced by costs and the fluctuations of the aggregate demand, the economy may be at a given point in other points than those from the aggregate supply. In the recession periods, the production is under the potential level, but in the really intense activity (war, for example) goes above the potential level.

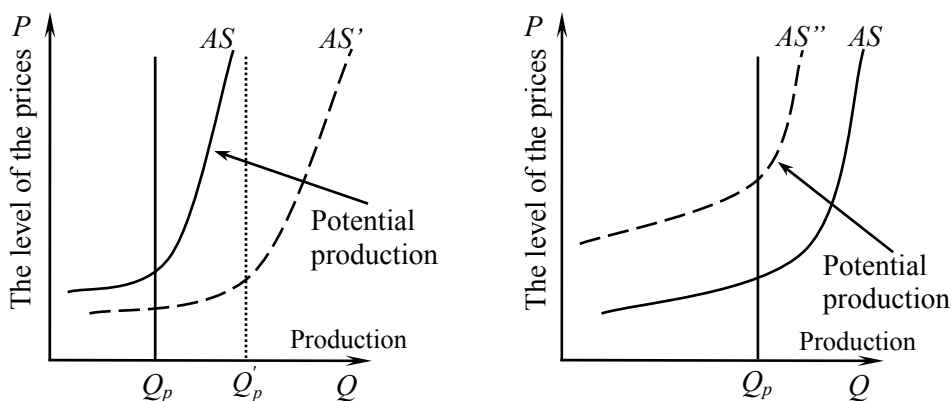
In the economy would produce above the potential level, the prices start to increase faster as the resources start to diminish. If the economy produces under the potential, it is confronted with a high level of unemployment and an excess of capacity. The critical level of the production which is considered potential is situated between the two extremes.

But, we underline the fact that the potential production is a dynamic index. The curve of the aggregate demand is moving to the right as the potential production grows (of the development of the economy);

**b)** *The production costs (the costs of the entries)* – as the production costs grow, a certain level of the production is accomplished for a higher price. For example if the costs are double, the selling prices can also be doubles. The curve of the aggregate supply is moving upwards, so that each pair (P,Q) can become (2P, Q).

The most significant implications on the aggregate offer have the wages expenses from the big economies (USA for example) and the import costs from the smaller economies (The Netherlands, Hong Kong).

The effect of the variation of the potential production and of the costs on the aggregate offer is represented in figure no. 1



a) The Influence of the variation of the potential production      b) The influence of the variation of the prices

**Fig.1: The modification of the aggregate supply under the influence of the potential production and the selling prices**

The growth of the potential production without the modification of the production costs determines the movement of the aggregate curve from the AS position to the AS' position (figure 1.a) and the growth of the production costs without the modification of the potential production determines the movement of the aggregate curve from the AS position to the AS'' position (figure 1.b) [Samuelson Paul, Nordhaus William, 2000].

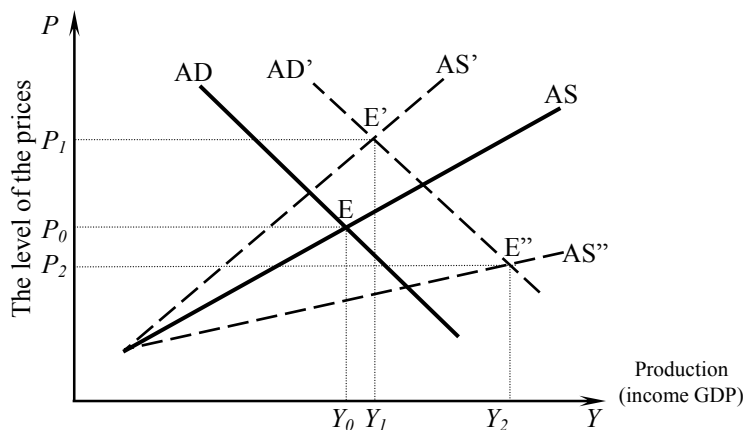
### 3. The dependence of the production and prices on the interaction of the aggregate supply and demand

The aggregate supply and demand are basic elements in the prospective analysis of the production, inflation and economic growth but also in the political economy. The levels of the production and of the prices as well as hiring the labor force depend on the interaction between the aggregate demand and offer. For the economic policy it is important the limitation of the offer. So, the problem is what type of relation is between the aggregate supply and demand, on one hand and on the other hand between employment and prices.

The aggregate demand represents the relations between the expenses for good and service and prices. If the production is not limited, then the growth of the aggregate demand generates the growth of the production and of the employment without affecting the prices. Under such circumstances, an expansionist economic policy is imposed in the field of the aggregate demand. If the labor force is fully employed, then the growth of the aggregate demand is firstly reflected in the growth of the prices or the inflation. The aggregate demand may be modified by the economic, monetary and fiscal policy. The level of the prices and of the production is situated on the intersecting point between the aggregate supply and demand.

The aggregate supply and demand can be described as a relation between the general price level (on has to take into account the index of the consumption prices or the GDP deflator) and production (GDP or Z). If we consider them together, the aggregate demand and supply allow us to answer the problem related to the balance level of the prices and production from an economy. The modification of the aggregate

supply and demand shows the way in which the prices and the production are moving (figure 2).



**Fig. 2: The linear curves of the aggregate supply and demand**

The curve of the aggregate supply (AS) presents the quantity of production which the firms are willing to offer for a certain price level. The AS curve is ascending because the companies offer a higher production for higher prices. The curve of the aggregate demand (AD) presents the combinations between the level of the price and the level of the production when the goods market and the monetary market are at the same time in balance. The AD curve is descending because the high prices decline the value of the money offer, which leads to the reduction of the product demand. The intersection of the AD and AS curves in E determined the balance level of the production ( $Y_0$ ) and prices ( $P_0$ ); the movement of any of these curves leads to the modification of the level of prices and of the production.

The movement of the aggregate curve to the right ( $AD'$ ) is determined by the growth of the money offer; due to this movement, the balance of the economy is moving to the  $E'$  point. The level of the prices moves upwards from  $P_0$  to  $P_1$ , and the level of the production from  $Y_0$  to  $Y_1$ . Consequently the growth of the monetary mass draws both the growth of the prices and of the production. As one can notice, the growth of the prices depends on the ascension of the supply curve (AS) and on the extent in which the curve (AD) is moving. [Ciurlău Constantin, 2006].

#### **4. The curve of the aggregate supply (AS)**

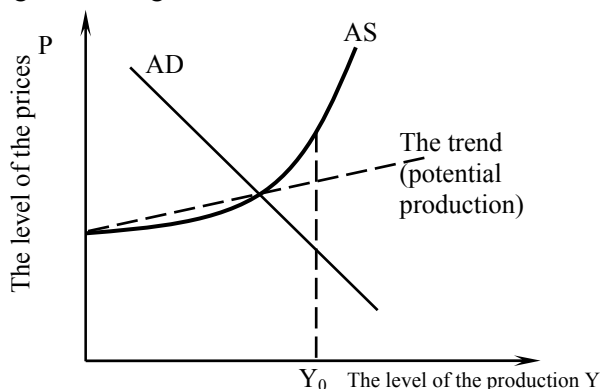
This is a horizontal short run curve (Keynes curve for the aggregate supply) and a vertical long run curve.

The classical curve points out the fact that the goods supply is the same no matter what the level of the prices is. The curve is based on the presumption that the labor market is in balance; one also has to take into account that fact that the price level sums up the total of the prices. On a single market the manufacturers can increase the price of their products if the demand is high. The collateral effect is the run of the productive factors from the markets with a lower demand. If the demand is high at the level of the entire economy then all the factors of production are functioning, and there is no way to increase the production by drawing on new factors; the consequence is the price growth. The level of the production which corresponds to the complete use of the labor

force is called, as it was already shown, potential GDP( $Y^*$ ); is grows as the resources grow and the technology improves; the position of the classical curve of the supply is thus moving to the right. It is important to notice the fact that although the potential GDP is modified each year, these modifications do not depend on the price level. It is said that the potential GDP is exogenous in relation with the price level; moreover, the modifications of the potential GDP are relatively short. One can draw only a single vertical line of the potential GDP, also called long run aggregate supply, without questioning the movement to the right which is due to its growth.

Keynes curve points out the fact that the companies offer any volume of goods for which there is a demand, at the level of the current price. The idea is that due to the unemployment, the companies may hire as much labor force as they want for the current level of wages. So one assumes that under these circumstances the average production costs cannot be modified, while the level of the production modifies. Consequently the companies are willing to offer, at the level of the existing price, as much as they can. The genesis of the curve can be found in the period of the Great Depression, when the production seemed not to be able to grow, not only by the mobilization of the fixed capital and the unemployed, so there were no price growths. Presently, this phenomenon is hidden under what is called freezing the prices on a short term. On a short terms, the companies do not modify their prices (neither the wages) when the demand is moving; but in exchange, they increase or diminish the production; as a result the curve of the aggregate demand is quite horizontal on a short run. It is important to mention that on a horizontal curve of the aggregate demand, the price level does not depend on the GDP. The prices grow almost every year in most of the countries; in other words, there is always a certain developing inflation, even if it is small. The growth of the prices may be associated with an ascending movement of the curve of the aggregate supply but not with the movement along the curve. Assuming that there is an economy without a predicted inflation, the key-point is that, on a short term, the price level is not affected by the current GDP levels.

The observation which is imposed is that the aggregate supply does not evolve according to a straight line – figure no.3.



**Fig. 3: The non-linear aggregate supply and demand**

When the effective production is under the level of the potential production, the curve which represents the aggregate supply is almost straight. Under these circumstances, the prices and the wages do not have the tendency to grow. When the effective production is above the potential production, the curve of the aggregate supply is sharp, and the prices tend to continuously grow. The effects of the modification of the

aggregate demand on the incomes and prices depend on the level of the potential production. The growth of the production in order to reach the level of the aggregate supply without increasing the prices, leads to an active political economy, in the sense that it will opt for the growth of the demand and implicitly for a high level of the employment and of the production. [Dornbusch Rudiger, Fisher Stanley, Startz Richard, 2007; Dornbusch Rudiger, Fisher Stanley, 1997; Genereux Jacques, 2000; Băcescu Marius, Băcescu-Cărbunaru Angelica, 1998].

### **5. The curve of the aggregate demand (AD)**

As we have mentioned before, the curve of the aggregate demand represents the combination between the price level and the production level when the monetary and goods markets are at the same time in balance. The expansionist policies, as for example the growth of the level of governmental acquisitions, the reduction of the taxes and the growth of the monetary mass, determine the movement to the right of the curve of the aggregate demand (AD). The curve of the aggregate demand is affected at the same time by the trust of the consumers and of the investors.

The correlation of the curve of the aggregate demand with the production and the prices is quite sophisticated. Understanding the aggregate demand as a relation between the production and prices is that the aggregate demand depends on the real money offer – the value of the money supplied by the central bank and the banking system. If the nominal money supply is noted with  $\bar{M}$  and the price level with  $P$ , then the real money supply is given by the relation  $\bar{M} / P$ . When the real money supply grows, the installments of the interest decline and the investment grows; the aggregate demand also grows on the whole. When the real money supply declines, the installments of the interest grow the investments decline and consequently the aggregate demand declines.

At a given level of the nominal money supply, the real money supply diminishes if the prices are high. The explanation is simple: the high prices mean a low value of the available money quantity. So consequently, a high level of the prices means a low aggregate demand, and a low level of the prices means a high aggregate demand. This is the reason for which the curve of the demand is descending.

The curve of the aggregate demand represents a balance situation both of the goods market but also on the monetary market. An expansion on the goods markets (generated for example by the growth of the trust from the consumers or by an expansionist fiscal policy) moves the curve of the aggregate demand upwards and to the right. Joining together the goods and monetary markets in order to derive the curve of the aggregate demand implies considerable details. In order to understand easily the curve of the aggregate demand, one has to put aside for a moment the goods market.

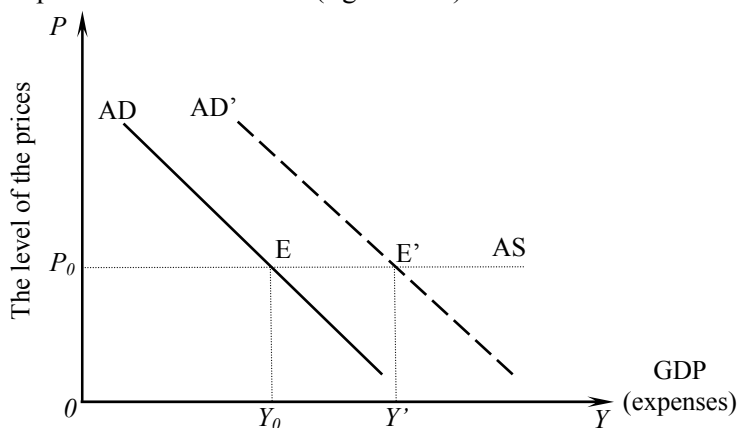
The quantitative theory of the money offers a simple way to approach the curve of the aggregate demand even if it puts aside some important elements. The total amount of spent money from a year (nominal GDP) is equal with the product  $P \times Y$ . The turnover speed of the money is noted with  $V$  – the number of turnovers from a monetary unit in a year. If the central bank offers  $\bar{M}$  monetary units, then:  $\bar{M} \times V = P \times Y$ . If an additional supposition is made, namely that  $V$  is constant; one notices that the previous relation is the curve of the aggregate demand. When the money offer is constant, the growth of the production ( $Y$ ) has to be compensated by a decline of the prices ( $P$ ) and vice versa. The reverse relation between the production and prices leads to the decline of the prices ( $P$ ) and of the demand curve. The growth of the money supply moves the

curve of the demand upwards for any given Y value. Any growth of the nominal monetary mass moves upwards the curve of the aggregate demand in a directly proportional relation with the respective growth of the nominal monetary mass. [Dornbusch Rudiger, Fisher Stanley, Startz Richard, 2007; Dornbusch Rudiger, Fisher Stanley, 1997; Genereux Jacques, 2000; Băcescu Marius, Băcescu-Cărbunaru Angelica, 1998].

### 6. The effects of the aggregate supply under the two circumstances on the policy of the aggregate demand

The pattern of the aggregate supply and demand may be used in order to estimate the effect of the two circumstances of the aggregate offer on the policy of the aggregate demand.

**Keynes' theory:** if we consider a combination between the curve of the aggregate demand and Keynes curve of the aggregate supply, the initial balance (E) is situated on the intersection of the two curves (figure no 4).



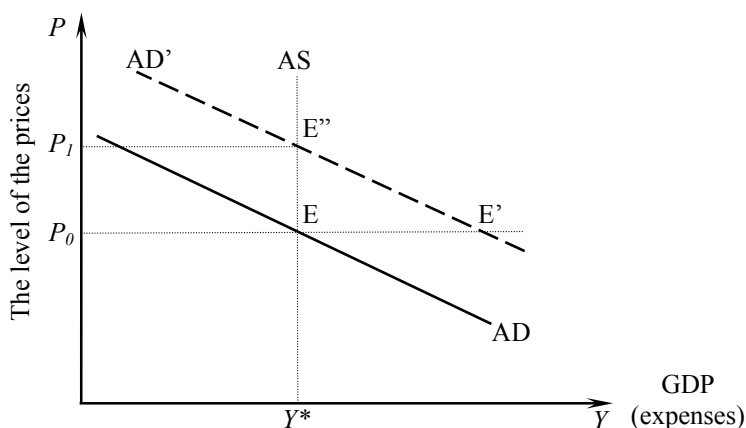
**Fig. 4: The expansion of the aggregate demand according to Keynes' theory regarding the aggregate supply**

In the point E, the goods market and the monetary market are in balance. This is considered to be a growth on the aggregate demand which moves the curve of the aggregate demand to the right (from AD to AD'). The new balance is to be found in E' where the growth of the production appeared. The companies are willing to offer any volume of production at a given price level ( $P_0$ ); for this reason there is no effect on the prices.

**The classical theory:** The curve of the aggregate supply is vertical under the circumstances of a production at the level of the full use of the labor force. The companies offer the potential level of production ( $Y^*$ ), no matter what the price is. Under these circumstances referring to the supply different results are obtained as compared to the one given by Keynes's pattern. The price level is not given; this depends more on the interaction between supply and demand. In the balance point there is a complete use of the labor force; according to the presumption, the companies offer production at the level of the total use of the labor force, for any price level (figure 5).

The expansion moves the aggregate demand in AD'. At the initial price level ( $P_0$ ) the expenses of the economy move to E'. The goods demand has grown at the price level  $P_0$ . The companies cannot obtain the labor force for the growth of the production

and the production supply cannot satisfy the growing demand. As the companies hire additional labor force, they increase their personnel expenses and the production costs, so that they are forced to increase the price for their production. Consequently, the growth of the demand leads only to the growth of the prices and not of the production. The growth of the prices reduces the real monetary mass which has as a consequence the reduction of the expenses. The economy is moving upwards (to  $AD'$ ), up to the moment when the prices grow enough and the real monetary mass declines sufficiently in order to reduce the expenses at a level consistent with the national production. [Dornbusch Rudiger, Fisher Stanley, Startz Richard, 2007].



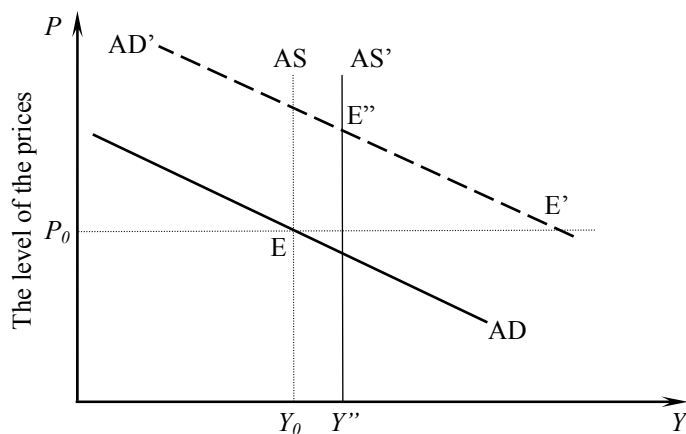
**Fig. 5: The expansion of the aggregate demand under the classical theory of the aggregate supply**

### 7. The economic approach from the point of view of the supply

The economists, generally, declare in favor of economical policy which should lead to the movement of the aggregate curve to the right by increasing the potential GDP. The policies focused on the aggregate supply, although they are not easy to implement, are accepted because they eliminate the unnecessary regulations, they maintain an efficient legal system and they encourage the technological progress. There are some politicians (and not only) who use the collocation “economic approach from the point of view of the supply” referring to the fact that the aggregate supply grows considerably by reducing the taxation system – so much that if  $t$  would grow (and not decrease) the collecting level of the taxes. Even the political allies who support this approach (for example George Bush senior, before being elected president) called this notion “woodoo economy”. The diagram aggregate supply-aggregate demand may be used to estimate the consequences of the reduction of the income taxes (figure 6).

The reduction of the income taxes has effects both on the aggregate supply but also on the aggregate demand. The curve of the aggregate demand is moving to the right (from  $AD$  to  $AD'$ ). The movement is relatively large. The curve of the aggregate supply is also moving to the right (from  $AS$  to  $AS'$ ), because the reduced income taxes increase the motivation to work. The economists knew that the effect of such a motivation is quite small so that the movement of the corresponding section of the potential GDP from  $Y_0$  to  $Y''$  is quite small.





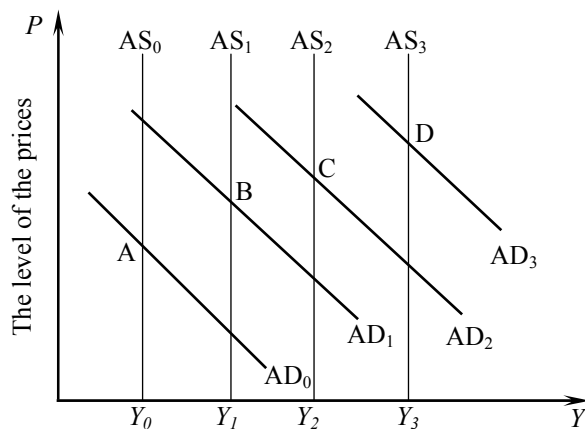
**Fig. 6: The effects of the reduction of the income taxes on the aggregate supply and demand**

On a short term the economy is moving from E to E'; GDP grown substantially from  $Y_0$  to  $Y''$ . As a consequence the fiscal decline proportionally with less than the decline of the income tax; but that is just an effect of the aggregate demand. On a long term the economy is moving towards E'', GDP is higher, but only with a small value from  $Y_0$  to  $Y''$ . As a result of this situation, the total level of collecting the taxes decreases and the deficit increases. Moreover, the prices are still high. USA has experienced this economic approach from the point of view of the supply, by reducing the taxation in the period 1981-1983. The results resembled the predictions.

The offer-based policies are not totally unacceptable. In fact only these policy can provide a permanent growth of the production. The management policies are useful only for a short term, even if they are important. For this reason, many economists are in favor of the reduction of the taxation with the purpose of obtaining an incentive effect (small but real). The same economists believe in the stimulating effect of the simultaneous reduction of the government expenses. The level of the tax collections decreases, but, at the same time, the governmental expenses decrease so that the effect on the deficit is almost neutral.

The curve of the aggregate supply on a long term is moving to the right in a constant rhythm. It is estimated a low annual rate of 2% and a 4% rate represents a high growth. Contrarily, the modifications of the aggregate demand can be higher or lower according to the modifications of the money supply (figure 7).

It is also noticed that the production grows as the curves are moving towards the right. There are also some differences from a sub-period to another (sub-periods are considered to be relatively equal), but not excessively large. There are large vertical movements of the aggregate demand, by contrast, so that the prices have grown much faster in the first sub-period as compared to the recent ones. Prices grow as many times as the aggregate demand is modifying than the aggregate supply. For longer periods of time, the production is determined by the aggregate supply and the prices are determined by the movement of the aggregate demand in relation with the movement of the aggregate supply. [Dornbusch Rudiger, Fisher Stanley, Startz Richard, 2007].



**Fig. 7: Long run movements of the curves of the aggregate demand and supply**

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