Classical and Keynesian thinking in terms of modelling
Podejście klasyczne i keynesowskie do modelowania

Abstract: This paper renders the evolution of economic theories from classical and neoclassical specific conceptions to Keynesian and neo-Keynesian approach, underlining the arguments and contra-arguments of each side in supporting their ideas. The equilibrium on different markets is rendered according to the vision of the said thought’s adepts both graphically and by means of representative models. The article, covering a period of about two hundred years represents in fact a brief history of the economic life of the time, reflected, with a critical eye, in a very personal manner.

Keywords: macroeconomic, modelling process, IS-LM model

Introduction

The macroeconomic theory has been supported, since its beginning, by models reflecting, initially timidly, then increasingly ardent, the ideas expressed by the theoreticians of the time. The modelling process has met in time various forms of expression as a consequence of the evolution in the economic knowledge area and also, on one hand, as result of the changing economic conditions imposing the adaptation of the existing models to the said circumstances and, on the other hand, from the perspective of the consistent development of the econometric apparatus and of the computation technique, which allowed the continuous surpassing of the limits, determining the issue of the so-called macro-econometric models. In 1776 we assist to the birth of the classical model of Smith who, relying on the results provided at microeconomic level, dedicates himself to the analysis of the labour demand and supply as fundamental equilibrium. Starting with 1936, appears the basic Keynesian model, an extremely simplified version of the economy, rendering the equilibrium status without considering the labour market, then
to the issue of the well-known IS-LM Keynesian model, with two versions, the one with invariant prices, respectively the one where the aggregate supply-demand ratio regulates the level of the nominal price and, as an extension of the latter, to the outlining of the Mundell-Fleming model, destined for the analysis of open economies, where the equilibrium is reached by adjustments of the real rate of exchange, interest rate and income.

1. Premises of the economic classicism

The macroeconomic theory, generically speaking, has passed through different stages, attracting on its way both partisans and opponents who have launched new ideas in their efforts to reflect, in a more realistic manner, the operational mechanisms of the economy, and to detect the optimum modalities for stimulating the economic growth.

Year 1776 reflects the appearance of the first reference economic study\(^1\), belonging to the one who was to be subsequently called „the parent of the economic science” – Adam Smith. His basic theory, contested and reconsidered by the various economic thoughts following it, and known nowadays as the classical theory, starts from the idea that the flexibility of prices, wages and interest rates provides the necessary premises for equilibrating the markets, the production being obtained at full employment. Under such circumstances, the market self-regulates, generating economic stability, the state intervention being necessary only at a minimal level, just for ensuring, by supply policies, the freely operating of markets, and the maintaining of an equilibrated budget. In this way, the economy succeeds in permanently reaching the natural level of real gross domestic product, its self-adjusting mechanisms allowing it to quickly surpass the unavoidable deficit of surplus deviations in relation to such level, in order to come back to the right way.

Therefore, the full employment, quintessence of the classical economy, is considered the way followed by any economy let to operate without constrains. Even when disequilibrium occurs in this respect, when there is a certain level of unemployment, the equilibrium would re-establish by the related diminish of wages, naturally accompanied by the increase of the labour demand and, inevitably by the reset of the initial equilibrium. The equilibrium is also reached when there are discrepancies between the level of savings and the level of investments. The decrease of the weight of investments in total available incomes leads to a drop in the demand for money and, implicitly, from the desire to stimulate it, to a diminish of the interest rate which becomes in this way attractive for the potential investors who would re-establish the equilibrium on this market. (Figure 1).

\(^1\) The paper An Inquiry into the Nature and Causes of the Wealth of Nations represented a key moment in the economic science evolution.
Beyond the free market theory, other two key aspects finally mark the classical economic thinking: the Say's law and the quantitative theory of money.

Therefore, an important element of the classical theory is the Say's law\(^2\), stating that, in a market economy, the goods and services are produced to be changed with other goods and services, fact revealed by the well-known expression „products are paid with other products”\(^3\), reflecting in essence the fact that, on any market, the total supply would be permanently covered by the total demand derived from consumption, as the producer would adjust its prices or production so as to be able to sell it entirely. An increase of the productive offer would lead, for instance, to an increase of the expenses destined for the acquisition of those goods, and thus to an augmentation of demand, the full employment being in this way guaranteed. Even in case of local disequilibrium, the surplus on one market will compensate the disequilibrium on other markets.

\(^2\) Jean-Baptiste Say, a renown classical economist launched in 1803 „the law of markets” according to which „aggregate supply create sit own aggregate demand”

When an economy reaches a certain level of the real gross domestic product, it generates the incomes necessary to purchase it, offering the possibility to fully require the production obtained and thus to cover the natural level of it. Yet, imperfections may occur: the income may not be entirely directed to the acquisition of goods and services, a part of it being saved, therefore causing a drop in demand in relation to the supply, this automatically leading to an adaptation of the supply which, by decrease, generates underemployment. However, the economies would be subsequently oriented either towards the consumption of goods and services or towards investments, both components of gross domestic products, thus allowing the latter to regain its equilibrium.

Money is neutral according to the classical economists, not exerting influences on the real economy; this reveals the classical dichotomy between the real factors of economy, such as level of production, employment and consumption and the nominal ones like level of prices, wages or exchange rate, so that the increase of money supply would be translated into a generalised increase of prices, and not into a production surplus. This idea might be rendered by the quantitative theory of money, having embodied miscellaneous forms, the most approached version being that of Irving Fisher, by its renown relationship:

\[ M \times V = P \times Q \]

which reveals the possible increase of prices \((P)\) caused by the increase of money supply \((M)\), when the money circulation velocity \((V)\) and the quantity of goods produced and sold \((Q)\), at full employment level, remain constant. Therefore, keeping inflation under control would be indissolubly related to the capacity to adequately manage the money supply.

The neoclassical theory starts in essence from the premises of the economic classicism, being considered by many economists as an extension of the latter. Yet, the neoclassical conception encompasses, as expected, new elements particularising it, such as a different vision on the perceived value of goods, now analysed depending on the utility generated by it and experienced by consumers, or the launching and popularisation of the marginal utility concept, finally influencing the economic agents in adopting their decision to produce or consume one good or another. The neoclassical economists approach the demand and supply considering the rationality of individuals and their capacity to maximize their satisfaction, under the budget constraint, respectively the profit, under the production costs constraint, based on available relevant information.

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Three hypotheses of the neoclassical analysis are therefore revealed:

1. Individuals have rational preferences and allocate a value to each product;
2. Individuals and firms pursue to maximize their utility, respectively profit;
3. Individuals act independently, based on available relevant information.

Based on these hypotheses, a series of neoclassical sub-theories have emerged, such as the firm theory, where the demand is regarded as deriving from consumer’s preferences and the supply as originating in the characteristics of the production factors, or the consumption theory, based on the maximization of utility in consumption.

The market demand and supply are aggregated based on the results of the microeconomic analysis, the interaction between them allowing the determination of equilibrium under the conditions of flexibility of prices, wages and interest rates, the state intervention been deemed, as in the incipient economic classicism, as irrelevant, without influences on the decisions of economic agents.

This conception has lead to the construction of the classical general equilibrium model, which describes economy by aggregating the behaviours of individuals and firms. Individuals, regarded in this model both from the position of employees and employers, make choices depending on their tastes and aims animating them, given their decreasing marginal utility and the fact that their wishes are surpassed by their realisation possibilities. A highly simplified form of the classical general equilibrium model is described hereinafter.

The production function is analysed as being exclusively dependent on the labour production factor. The labour force demand, manifested by firms, is a derived demand, resulting from the demand and supply of end products. The firm’s goal is to maximize its profit, considering the demand for its products, the related costs and the technology it holds.

The production function is decreasing and concave in relation to the labour force demand, as result of the decreasing marginal product of the labour force and the profit function is analysed in real terms:

\[ Y^s = Y^s(L^D) \]  
\[ \text{Pr} = Y^s - w \times L^D \]  

where
\[ Y^s \] – aggregate supply of goods and services,
\[ L^D \] – labour force demand,
\[ \text{Pr} \] – profit,
\[ w \] – real wage.

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2. The fundamentals of the classical general equilibrium model are the results of the effort of the French economist Leon Walras, made in 1870, mainly reflected in its paper: *Elements d'Economie politique pure, ou Théorie de la richesse Sociale*, which contains a series of models created based on various aspects of real economy.
The user intends to increase its satisfaction given by consumption and wage, while diminishing the disutility caused by the time wasted to work, given the budget constraint:

\[ U = U(Y^D_c, D(L^S)) \]  \hspace{1cm} (3)
\[ U = Y^D_c - D(L^S) \]  \hspace{1cm} (4)
\[ Y^D_c = Pr\times w \times L^S \]  \hspace{1cm} (5)

where
- \( U \) – consumer’s utility,
- \( Y^D_c \) – consumer’s demand for goods and services,
- \( L^S \) – labour force supply,
- \( D(L^S) \) – labour disutility.

The aggregate demand will be:

\[ Y^D = C + I + G \]  \hspace{1cm} (6)

where
- \( Y^D \) – aggregate demand for good and services,
- \( C \) – private consumption,
- \( I \) – private investments.
- \( G \) – governmental expenses (consumption and public investments)

At equilibrium, the aggregate demand equals the aggregate supply on the market of goods and services:

\[ Y^D = Y^S \]  \hspace{1cm} (7)

Although, in the line of classics, the neoclassical economists considered the markets as self-adjusting in the long run, at full employment, they were conscious that the standing was quite different for the short run, as economy was directing to the equilibrium state.

On long term, economy will lead to full employment, while maintaining the equilibrium on the market of goods and services, so that any subsequent increase in demand will result only in the increase of prices, the aggregate supply taking the form of a vertical line. In exchange, on short term, any increase of the aggregated demand, caused by an increase of money supply, a decrease of taxes or an increase of government expenses, will cause an increase of the quantity of products and also an augmentation of prices by the producers, in order to annihilate the effect of the decreasing returns. (Figure 2).
2. Passing to the Keynesian theory

The classical theory, subsequently encountered under the form of the neoclassical theory, which had dominated the nineteenth century and the beginning of the twentieth century, have begun to lose weight on the occurrence of the Great Depression of ’29–’33, when they proves to be inefficient in explaining the reasons for which the production was no longer covered by demand and the unemployment rate was continuously growing, the market being unable to find any longer the resources necessary to self-adjust; all this was opening the way to the alternative ideas of John Maynard Keynes, economist who gave birth to a new theory bearing his own name – the Keynesian theory.

The paper published by Keynes, in 1936, which practically marks the appearance of modern macroeconomics, disconutenhanced the classical theory that markets finally self-regulate by adjustments of prices, wages and interest rates, trying to demonstrate, by resorting to the analysis of labour market, monetary market and inflation theory, what had been in fact already

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9 The General Theory of Employment, Interest and Money.
outlined by the economic crises of those times: in certain cases, markets do not reach equilibrium.

The situation generated by the drop in the labour force demand, followed by a decrease of wages, was not necessarily transposed into the return to full employment status, because, by blocking wages at a low level, as according to the Keynesian thinking the flexibility principle had been abandoned, maintaining in activity the employees was not encouraged, thus exerting pressures on employers by determining them not to diminish wages to the necessary level so as to reach equilibrium. The same happens when blocking the prices of goods and services under the equilibrium point level, this determining the incomplete use of the economy inputs, therefore impeding its return to the initial level of real gross domestic product. (Figure 5).

![Diagram](image)

Figure 3. Re-establishment of equilibrium on the labour force market and on the market of goods and services, according the Keynesian conception

The quantitative theory of money, also approached in the vision of Fisher, was also attacked with supporting arguments: in difficult economic times, in uncertain situations, the intention to minimise risks determines individuals to increasingly manifest their preference for liquidity, this inevitably causing a decrease of consumption and/or investments, therefore leading to a slowdown of economy and, implicitly, to the failure of markets in re-establishing equilibrium. As supply is adapted to demand, a higher demand
of liquidities determining an increase in money supply, and a lower demand for goods and services generating a diminish of the related supply but also a decreased money circulation velocity, the classical hypothesis according to which money circulation velocity remains constant, is abandoned by Keynes, it being replaced by the price rigidity principle. If the demand level drop is not followed by a change to the same direction of prices, the supply surplus would progressively determine dismissals, impeding in this way the economy from running at full employment.

In the revenues-expenses model of Keynes, the equilibrium level of real gross domestic product is that level perfectly correlated with the existing level of aggregate demand. If the demand is not sufficiently high as to allow the acquisition of the entire production achieved, it would be reduced until re-establishing equality, but under the level of real natural GDP.

So, even if economy doesn’t find itself at full employment, this doesn’t means that equilibrium cannot be obtained for different levels of unemployment rate, but in order to fulfil such goal, the state intervention becomes a must. In case of demand deficit, as for instance in case of recession, it should be stimulated both by an expansionary fiscal-budgetary policy, consisting in increasing governmental expenses, in parallel with the reduction of direct and indirect taxes, and by an expansionary monetary policy, rendered by a slow augmentation of money supply, accompanied by the diminish of the interest rate, thus inhibiting savings. In case of demand surplus, the intervention will consist, in exchange, in restrictive fiscal-budgetary and monetary policies.

An important issue underlined by Keynes and criticised by some of his opponents\(^1\) is related to the multiplying effect determined at the level of aggregated demand; thus, the exogenous change in demand would be amplified at the level of the real gross domestic product. An increase in demand causes an increase in supply, followed by an upward modification of the labour force demand. An increase in the labour force occupational rate would determine higher aggregate revenue and, hence, a new increase in demand, revealing a chain effect, attenuated only by the level of expenses made based on the additional income.

Resuming, the Keynesian revenues-expenses model reflects the relationship established between the aggregate expenses and the real national revenue existing at the time. The public aggregate expenses as a whole and private expenses directed towards investments are seen as being autonomous in relation to the initial real national revenue, while the expenses destined for private investments are partially dependent on it.

\[
Y^D = C + I + G \tag{8}
\]

\(^1\) According to the Barro-Ricardo equivalence theorem, the effect of the budgetary deficit on the aggregate demand cannot be adequately determined when missing information regarding the means necessary for subsequently covering that deficit.

ZN nr 92  
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\[ C = C_0 + c \times Y^D \]  \hspace{1cm} (9)
\[ A = C_0 + I + G \]  \hspace{1cm} (10)
\[ Y^D = A + c \times Y^D \]  \hspace{1cm} (11)

where

- \( Y^D \) – aggregate demand,
- \( C \) – private consumption,
- \( I \) – private investments,
- \( G \) – governmental expenses (consumption and investments),
- \( C_0 \) – autonomous consumption,
- \( c \) – marginal propensity to consume\(^{12}\),
- \( A \) – autonomous expenses.

At equilibrium, the aggregate demand equals the aggregate supply:
\[ Y^S = Y^D \]  \hspace{1cm} (12)

where

- \( Y^S \) – aggregate supply,

In consequence, the Keynes multiplier \( m \) may be determined, as follows:
\[ Y^S = m \times A \]  \hspace{1cm} (13)
\[ m = \frac{1}{1-c} \]  \hspace{1cm} (14)

Considering that the marginal propensity to consume represents just a part of the real national revenue, the one destined for consumption, this indicator is always comprised between 0 and 1, therefore determining values of the multipliers that exceed 1, this implying that, at equilibrium level, the gross domestic product is a multiplier of the autonomous aggregate expenses (Figure 4).

The graph reveals two cases of aggregate demand (Yd1 and Yd2), depending on the level of autonomous demand (A1, respectively A2), the slope being the result of the marginal propensity to save. As the real national revenues increases, the aggregate demand increases too, the equilibrium being reached in the point where \( Y^S = Y^D \), more exactly at the intersection of the aggregate demand with the line drew at 45° from the origin point.

\(^{12}\) Often, economists make distinction between the marginal propensity to consume based on permanent income and the marginal propensity to consume based on temporary income, as in the first case, the temptation to change the consumption level is higher (Barro, R. and Grillio, V. (1994), European Macroeconomics, Macmillan Publishers. pp. 417-418).
The Keynes ideas have deeply marked the economic thinking, they being subsequently taken over and deepened by remarkable economists such as John Hicks, Paul Samuelson, Franco Modigliani, James Tobin or Robert Solow, who developed theories regarding consumption and money demand, based on the grounds laid by Keynes\textsuperscript{13}.

His successors, using the macroeconomic fundamentals of Keynes and resorting to the microeconomic neoclassical approach, having roots in the general equilibrium model of Walras, gave birth to what was to be called in the specialised literature as the neoclassical synthesis, thus constructing a new theory – the neo-Keynesian theory.

Although contested from various perspectives, the neo-Keynesianism succeeded in imposing itself by the middle of 1950, spreading a certain manner of thinking resumed, under miscellaneous forms, by the subsequent generations of economists. The Keynesian conception, according to which the economy hardly achieves full employment, continued to be sustained, but a part of neo-Keynesians expressed their belief that, by the state intervention, the equilibrium status with a natural level of employment becomes possible.

One of the supporters of this idea was the economist John Hicks, who, by his model, tried to determine the fiscal-budgetary and monetary policies necessary for the correct management and equilibration of the economic activity. The IS-LM model\textsuperscript{14}, quickly adopted by the post-war economists due to the fact that it could be analysed in terms of the general equilibrium theory, correlated the demand and unemployment with three exogenous variables:

\begin{figure}[h]
\centering
\includegraphics[width=\textwidth]{figure.png}
\caption{Figure 4. Revenues-expenses Keynesian approach}
\end{figure}

\textsuperscript{14} The IS/LM model appeared on the occasion of the Econometric Conference of Oxford, as of September 1936, when Roy Harrod, John Hicks and James Meade, tried, by mathematical models, to synthesise The General Theory of Employment, Interest and Money of Keynes, being subsequently effectively constructed by John Hicks, in Mr. Keynes and the Classics - A Suggested Interpretation, Econometrica, v. 5 (1937): 147-159.
In the IS-LM model, the aggregate supply continued to be ignored, and the relationships were analysed from the perspective of a closed economy. While the public and private consumption and the governmental investments were regarded as in the Keynesian vision, the private investments became endogenous, being inversely correlated with the interest rate, thus determining multiple extensions at the revenue level. The financial sector was also approached, from the perspective of the monetary and capital market, reflecting in fact two key elements: money, with high liquidity level, non-risky, not representing a profit source and bonds, non-liquid, risky, but bearing interest rate. It is about a static model, destined for the short-run analysis, based on price rigidity hypothesis, the inflation not being considered, therefore generating a fix relationship between the nominal and the real interest rate.

\[ Y^D = C + I + G \]  \hspace{1cm} (15)
\[ C = C_0 + c \times (Y^D + TR - T) \]  \hspace{1cm} (16)
\[ C = C_0 + c \times TR + c \times (1 - t) \times Y^D \]  \hspace{1cm} (17)
\[ I = I_0 - g \times i \]  \hspace{1cm} (18)
\[ Y^D = C_0 + c \times TR + c \times (1 - t) \times Y^D + I_0 - g \times i + G \]  \hspace{1cm} (19)
\[ Y^D = Y^S \]  \hspace{1cm} (20)

where

- \( T \) – taxes collected at the state budget,
- \( TR \) – state transfers,
- \( I_0 \) – autonomous investments,
- \( g \) – sensitivity of private investments to the real interest rate,
- \( i \) – real interest rate,
- \( t \) – average tax rate.

Thus, the IS curve (investments = savings) is determined, reflecting the relationship existing between the interest rate and the level of real gross domestic product, which establishes the equilibrium on the market of goods and services:

\[ Y^S = \frac{1}{1 - c \times (1 - t)} \times \left[ C_0 + c \times TR + I_0 - g \times i + G \right] \]  \hspace{1cm} (21)

As for the financial sector, the equilibration of the money market causes the equilibration of the markets of bonds, therefore, for simplification reasons, the latter being eliminated from the model.

\[ \frac{M^D}{P} = L_0 + k \times Y^S - h \times i \]  \hspace{1cm} (22)
where
\[ M^D = M^S \] (23)

- \( M^D \) – nominal money demand,
- \( M^S \) – nominal money supply,
- \( L_0 \) – autonomous money demand,
- \( p \) – price index,
- \( k \) – sensitivity of the real money demand to aggregate supply,
- \( h \) – sensitivity of the real money demand to interest rate.

The LM curve (liquidity preference = money supply) reveals the relationship between the interest rate and the level of real gross domestic product, which establishes the equilibrium on the monetary market. The interest rate at equilibrium is thus determined as:

\[ i = \frac{1}{h} \left[ L_0 + k \times Y^S - \frac{M^S}{p} \right] \] (24)

The simultaneous equilibrium on the two markets is achieved at the intersection of the IS and LM curves, where both interest rate and output and the elements depending on them are analysed in endogenous terms.

\[ Y^S* = \frac{1}{1 - c \times (1 - t) + \frac{g \times k}{h}} \times \left[ C_0 + c \times TR + I_0 + G - \frac{g}{h} \times \left( L_0 - \frac{M^S}{p} \right) \right] \] (25)

\[ i* = \frac{1}{h} \left[ L_0 + k \times Y^S* - \frac{M^S}{p} \right] \] (26)

At a close look to the equations, we ascertain the consequences of adopting expansionary or restrictive fiscal-budgetary and monetary policies. An increase of governmental expenses or a diminish of taxes, for instance, generates an augmentation of revenue and of the interest rate which, at its turn, causes a decrease of the level of investments, while an increase of real money supply determines an upward movement of the gross domestic product simultaneously with a drop in the interest rate (Figure 5).
If the both expansionary fiscal-budgetary and monetary policies are promoted at the same time, the effect of real GDP increase would be evident, while the increase, decrease or maintenance at the same level of the interest rate depend on the amplitude of the two type of policies, as well as of the evolution of other economic components.

An extension of this model is constructed independently by Mundell\textsuperscript{15} and Fleming\textsuperscript{16}, by an analysis including also the foreign trade, thus bringing into discussion the modelling of an open economy. The Mundell-Fleming model, also called IS-LM-BP, which reveals the relationship existing in the short run between the real GDP, the interest rate and the exchange rate, has been used to demonstrate the principle according to which an economy may not maintain simultaneously fixed exchange rate, free capital movement and independent monetary policy, principle often denominated as „Mundell-Fleming trilemma”.


The model resumes the IS curve, enriching it with a new component, that is the net export, the remaining of the endogenous variables being taken over from the base variant.

\[
Y^D = C + I + G + NX \\
NX = X - IM \\
IM = IM_0 + m \times Y^D - a \times e \\
X = X_0 + b \times e
\]

\[
Y^D = C_0 + c \times TR + c \times (1-t) \times Y^D + I_0 - g \times i + G + X_0 - IM_0 - m \times Y^D + (a+b) \times e
\]

\[
Y^D = Y^S
\]

where
- \(NX\) – net export,
- \(X\) – export,
- \(IM\) – import,
- \(X_0\) – autonomous export,
- \(IM_0\) – autonomous import,
- \(m\) – marginal propensity to export,
- \(a\) – sensitivity of imports to the exchange rate,
- \(b\) – sensitivity of exports to the exchange rate,
- \(e\) – exchange rate,

Hence, the real GDP at the level of equilibrium on the market of goods and services would be:

\[
Y^S = \frac{1}{1 - c \times (1-t) + m} \times [C_0 + c \times TR + I_0 - g \times i + G + X_0 - IM_0 + (a+b) \times e]
\]

The LM curves remain the same as the one revealed by the IS-LM model, but a third curves emerges in this particular model, representing the balance of payments:

\[
BP = CA + KA \\
BP = NX + NT \\
KA = KA_0 + j \times (i - i')
\]

where
- \(BP\) – balance of payments,
- \(CA\) – current account,
- \(KA\) – capital account,
- \(NT\) – net transfers,
- \(i\) – domestic real interest rate,
At equilibrium:

\[ BP = 0 \]  

Thus, the BP curve could be rendered as:

\[ \left[ X_0 - IM_0 - m \times Y^D + (a + b) \times e \right] + NT + K\Delta_0 + j \times \left( i - i^f \right) = 0 \]  

The equilibrium in a small, open economy, depends on the degree of opening of the capital account (completely closed capital account for \( j = 0 \) and completely open capital account for \( j \to \infty \)) and of the level of flexibility of the exchange rate (fixed or floating exchange rate). Therefore, three variants become plausible, the forth one, implying a fixed exchange rate and a completely open current account being impossible, considering the above-mentioned trilemma. Here is, for exemplification, the case of a floating exchange rate with \( j \in (0, \infty) \), when the simultaneous equilibrium on the market of goods and services, the monetary market and the foreign market is reached at the intersection of IS, LM and BP curves.

\[ y^* = \frac{1}{1 - c \times (1 - r) + (g + j) \times k} \left[ C_0 + c \times TR + I_0 - \frac{g + j}{h} \left( \frac{M_S}{P} \right) + G - NT - K\Delta_0 + j \times i^f \right] \]  

\[ i^* = \frac{1}{h} \times \left[ L_0 + k \times Y^S - \frac{M_S}{P} \right] \]  

\[ \epsilon^* = \frac{1}{a + b} \times \left[ IM_0 - X_0 + m \times Y^S - NT - K\Delta_0 - j \times i^* + j \times i^f \right] \]

Considering a floating exchange rate, with the market of goods and services and the monetary market at equilibrium, but with a surplus of the balance of payments, the equilibration is reached by the appreciation of the domestic currency, which leads to the decrease of exports and increase of imports. The change of the net export, in the sense of its diminish, generates automatically, as a component of the aggregate supply, a movement of the IS curve decreasingly; in this case, the equilibrium on the three markets is re-established at a lower level of the interest rate and of the real gross domestic product than in the case of the first two market-equilibrium (Figure 6).
In fact, the IS-LM model, with its extensions including the balance of payments, is exclusively used to analyse the economic evolution in the short run, when the level of inflation does not entail changes which are worth to be taken into account. For this reason, it is mainly destined to be used as part of more complex models, allowing the flexibility of prices, the most eloquent example in this regard being the aggregate demand and supply model, where the aggregate demand curve reflects in fact the aggregate curve of the basic Keynesian model, but rendered as depending on different price levels.

Conclusions

Although crossed at various levels, both from the perspective of the theoretical research and in terms of modelling, as for certain variables considered and markets analysed, the two main economic thoughts: classicism and Keynesianism, with their extensions, which have dominated about two centuries, have clearly differentiated from each other by the vision of their adepts on the self-adjustment power of markets and the necessity of state intervention in economy.
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