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Teaching International Monetary Economics. Two different views

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Teaching International Monetary Economics. Two different views

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This paper presents a critical analysis of the way in which international monetary economics is normally taught. The objective of this paper is twofold. On the one hand, we show how the most popular international economics manuals deal with exchange rate theory and its link with balance of payments equilibrium. In particular, we stress how the models proposed in these manuals cannot explain one of the biggest macroeconomic problems of our time, that of the imbalances of the balance of payments. On the other hand, we put forward an alternative Keynesian model. Assuming neither full employment nor balanced trade over the short or long run, the paper is intended as a new contribution to the post-Keynesian analysis of exchange rate theory. Finally, our model gives an original insight into the relationship between Liquidity Trap and structural economic imbalances in modern economies.

Keywords: international monetary economics, exchange rate determination, endogenous money, global imbalances, post-Keynesian economics.

JEL: A20; B50; E12; F41.

1 – Introduction

This paper presents a critique of the teaching of international monetary economics. Economic crises are generally thought to offer an opportunity for radical reconsideration of economic theories highlighting their contradictions.

It is indisputable that during the years after the Global financial crisis illustrious representatives of the mainstream radically changed their point of view with respect to economic theory and policy proposals. Without claiming to be exhaustive, Romer (2016) emphasizes the importance of money in macroeconomic models, Gali (2014) points out the optimality to monetize public deficits in periods of recession and deflation, Blanchard and Summers (2017) present an unorthodox way out of the secular stagnation, Blanchard (2018) analyzes fiscal policy in periods characterized by low interest rates concluding that public debt is not harmful. The Nobel Prize winners Krugman and Stiglitz strongly asked for a paradigm shift in macroeconomic theory.

Nevertheless, the most successful textbooks used to teach students of economics are instead still grounded on the traditional theoretical hypotheses. Despite the presence of a few supplementary appendices devoted to the recent crisis and its interpretations, there is no recognition of the weaknesses of the dominant paradigm.

More precisely, the primary aim of our contribution is to show that the approach to international monetary economics put forward in textbooks can in fact be traced back to the theoretical framework of a mainstream aggregate general economic equilibrium in an open economic context. The dominant approach sees money as a mere tool and therefore its influence on the economic system as restricted solely to the sphere of prices. It is instead our view that understanding international monetary economics as an academic discipline should entail a clear grasp of its particular object of study, namely the international monetary system. This should also involve

particular attention to the historical dimension with the explicit aim of prompting reflection on money as an institution. Money is in fact the first economic institution and different forms of money presuppose and produce different economic relations, as argued by many relevant contributions in the literature.¹ Economic history can thus show that money has important and complex effects on all economic variables. It cannot be dismissed as a mere tool that supposedly has no effect on the real magnitudes of the economy.

The mainstream theoretical framework has highly significant implications as regards economic policy in the context of international monetary economics. It is indeed impossible to decide how to regulate the international monetary system without first recognising the fact that money is an institution and therefore the result of conscious political choices, in particular as regards the function of a store of value on which the propensity to hoard and consequently the health of a real economic system can depend.

What view of money could prove useful to understand structural global imbalances?

And what form of money could prove appropriate to establish a balanced international monetary system? This problem can be addressed at both the policy and theoretical levels. In the notes that follow, we will focus above all on the theoretical aspects of the issue.

Summarizing, in order to demonstrate the need to develop a non-orthodox approach to the research question, this paper seeks to provide a critical analysis of the way in which international monetary economics is usually taught. We will show that there is no orthodox model in undergraduates' textbooks, not even among the most complex AD-AS versions, capable of accounting for persistent imbalances in the balance of payments.²

Section 2 will present a brief overview of the concrete problems that the discipline has been faced with since the global crisis and that are not addressed in the textbooks.

Section 3 will present a simple aggregate model of general economic equilibrium in a closed economy and subsection 3.1 will show how this can be extended to an open-economy context through the introduction of purchasing power parity.

It will then be shown (3.2) how the mainstream approach seeks to account for the volatility characterising the foreign exchange market by introducing imbalances into the international system of payments, which are in any case supposed to be absorbed in the long period. Our discussion here will be confined to the way in which such arguments are developed in the major textbooks of international monetary economics, especially Krugman, Obstfeld and Melitz (2009).

Without claiming to be exhaustive, section 4 suggest some lines of research in the sphere of post-Keynesian analysis.³ As section 3, it will start from the analysis of a closed economic system, yet in line with the argument developed in Keynes's work (4.1), and then go on to extend the model to an open-economy context (4.2). As neither full employment nor balanced trade over the short or long run are assumed, this constitutes a new contribution to the post-Keynesian analysis of exchange rate determination.

¹ In *The Great Transformation*, for example, Polanyi repeatedly highlights the function of social integration created by money throughout history. Polanyi (1944) regards money as an institution that embeds the economy in social relations. The same approach can be found in Marc Bloch (1954). In his *Esquisse d'une histoire monétaire de l'Europe*, the founder of the French *Annales* school stresses that formulating a preliminary definition of money would mean precisely attributing a function "once and for all" to money itself, which would be a false representation. See also Cipolla (1982), who – as noted by De Cecco (2013) – regards the production and use of different forms of money in late medieval Italy as reflecting the conflicts between creditors and debtors. In other words, money reflects the conflicts between social classes that economic relations have helped to shape.

² Examination of graduate and postgraduate textbooks reveals that transversality conditions are often introduced in order to avoid long-term imbalances (Obstfeld and Rogoff, 1996).

³ We refer in particular to the line of research put forward in various contributions by John T. Harvey, based primarily on the conventionalist approach deducible from Keynes (1936, 1937) and developed on lines that the present authors regard as complementary by Orléan (2008) and Di Filippo (2011). See Lavoie (2015) for a precise explanation of the different lines of research in the field of Post-Keynesian Economics. See also Lughini (2009).

Section 5 will draw some preliminary conclusions.

2 – International Monetary Economics and Global Imbalances

It is important to bear in mind the context in which these considerations are set: a period in which the international monetary system is characterized by global imbalances, bilateral agreements and failed arrangements. Even though the latter subject is not specifically discussed here, it should be noted that many recent commentators underline the build-up of the American current account deficit and the Chinese surplus in the years immediately before 2007. Even though the global imbalances observed in the real world have emerged during the course of history in economic contexts characterised either by fixed exchange rate regimes or by managed bilateral exchange rates with capital controls, the present-day situation appears to involve a very particular institutional context that, as we shall see, necessitates radical rethinking of the theoretical foundations of international monetary economics.

As stressed by Varoufakis (2011) and others, the twin deficits of the US economy operated for decades like a giant vacuum cleaner, absorbing surplus goods and capital from Germany, Japan and then China. What mainstream economists attempted in the 1980s was to account for imbalances on the basis of the “twin deficit theory”: if the USA invests more than the country as a whole saves, it must import the difference from the rest of the world, thereby creating a trade deficit. Feldstein (1986) is probably the most frequently quoted contribution on this point. The fiscal surpluses registered during the Clinton administration induced to downplay the problem of persistent imbalances, despite the continued growth of the trade deficit.

The non-mainstream literature of post-Keynesian inspiration has, however, pointed out that the rise of financialisation and the retreat of regulators can be seen as simple by-products of the huge capital flows necessary to fuel the twin deficits of the United States. With the collapse of the Bretton Woods system, the dollar became the world’s first fiat money. It is possible for the hegemonic state, in this case the USA, to be a global debtor and to provide a risk-free asset to accommodate global demand for saving (Fields and Vernengo, 2012).

In this perspective, De Cecco (2012) suggests that reserve-building by Asian and other emerging economies may have helped to reduce the damage done by financial institutions in the advanced economies. In other words, the international dollar circuit provided the rest of the world with liquidity and stimulated the export-led growth in Asian and other emerging countries. The necessary counterpart to these current account imbalances is the accumulation of US dollar-denominated financial assets in foreign portfolios. It is debatable whether this is the most appropriate way to manage global imbalances. In fact, strictly speaking, it is not even a way to manage, but merely to finance, global imbalances.

The USA has been characterised since 2003 by a return to consistent federal deficits accompanied by a growing balance-of-payments deficit principally due to a massive increase in low-cost imports from emerging countries (like China) and to the simultaneous export of capital (above all foreign direct investments) to participate in the production of those same countries (consider the role of the multinationals). At the same time, China has registered increasing trade surpluses, not least by maintaining a “comparatively low” foreign value of its national currency. It has therefore been able to build up a considerable stock of national savings (and currency reserves, above all in dollars), most of which is reinvested in US treasury bonds. As has been pointed out,⁴ mainstream economists have tried to account for this situation above all on the basis of four hypotheses (which should not be regarded as necessarily alternative to one another), namely the savings glut hypothesis

⁴ See, among others, Cooper (2008), Krugman (2007), Palley (2014).

(Bernanke, 2005), the portfolio theory (Blanchard, Giavazzi and Sa, 2005), the developing country active policy on exchange rates (Dooley and Garber, 2007), and the asset shortage theory (Caballero, Farhi and Courinchas, 2008).

The non-mainstream literature of post-Keynesian inspiration has strongly criticised these hypotheses and stressed that the reason for the imbalances lies above all in the fact that the US dollar is the international currency. Following this strand of thought, serious discussion should therefore commence for a rethinking of the international monetary system.⁵

There is growing demand for regulation, often invoked in terms of a 'return to Bretton Woods'. Then and now, as stressed by Amato and Fantacci (2014) among others, we are theoretically faced with two possibilities reflecting two alternative principles. One is the principle embodied in the Bretton Woods system and persisting even after its demise, which tends to see money as a reserve asset making the accumulation of global imbalances possible, indeed even necessary, despite the original intention to absorb them.⁶ The other is the principle that inspired Keynes's plan for an International Clearing Union, which was instead intended to deprive money of the character of a reserve asset, thus making it the rule for international exchanges rather than an object of exchange and accumulation among others.

While it is not our intention here to illustrate the possible characteristics of an International Clearing Union today, it should be pointed out that preparatory work in the field of economic theory is essential if we are to initiate discussion of such a sensitive subject of economic policy⁷.

3 – On the dominant economic theory

The mainstream theory is inherently a microeconomic or at least microeconomically-based theory, and its analytical representation in the Walrasian version of general economic equilibrium would require as many equations with as many unknowns as there are economic agents.

The essence of the mainstream view of the functioning of the economic system as a whole, which is seen as the aggregate or representative outcome of individual behaviours, can be pinpointed, however, by means of a Fisher-type simplified model of general economic equilibrium consisting of the few equations needed to describe the relations between the fundamental quantities and prices and dating back to the first thirty years of the twentieth century.

The first step in the mainstream argument, which in this version develops in accordance with a precise causal order, regards the labour market, where the demand for labour (on the part of entrepreneurs) meets the supply of labour (on the part of workers).

Since the entrepreneurs' aim is the maximisation of profit, they have to decide the proportions in which to combine labour and machinery. Their demand for labour will therefore depend on whether it is economically advantageous to replace workers with machines or vice versa. If the cost of labour is high, entrepreneurs will find it worthwhile to adopt techniques of production with low intensity of labour, and vice versa. It should be noted that the cost of labour is given in mainstream theory by the *real* wage, i.e. the purchasing power of the monetary wage as determined by its relation to the level of prices (w/p). There is therefore an inversely proportional relation between the demand for labour and real wages for entrepreneurs (the function N_D in figure 1). For workers, whose objective is the maximisation of well-being, the supply of labour is instead directly

⁵ See Bibow (2008), Palley (2012), Papadimitriou, Hannsgen and Zezza (2006).

⁶ Two different explanations are given for the collapse of Bretton Woods: by mainstream theory the latter is regarded as stemming from the unwillingness of foreign countries to import US inflation whereas by the post-Keynesian school it is connected with the role of financial liberalisation starting from the 1960s. See Vernengo (2012).

⁷ As advocated again recently by Kregel (2019), among others.

proportional to real wages. If wages are high, workers will prefer more hours of work to more free time (the function N_s in figure 1).

There is one and only one equilibrium level of real wages at which the supply of and demand for labour are equal. Moreover, there will also be full employment at this level in the sense that there will be no *involuntary* unemployment (or at most some low degree of ‘natural’ or ‘frictional’ unemployment).

The second step in the mainstream argument regards the level of production and the market of the goods produced. Once the equilibrium real wage at which the supply of and demand for labour balance one another has been determined on the labour market, the level of employment will also be determined and the production process will be set in motion. With the ratio of labour to machinery now decided – by entrepreneurs in accordance with their economic advantage and by workers on the basis of their desire to work – the largest amount of goods that it is possible to produce with the given resources and techniques of production will be produced. This step is represented in figure 1 through the Cobb-Douglas function of production ($Y=AN^\alpha K^\beta$, where $A>0$ and $\alpha+\beta=1$). Is there any certainty that all the goods produced will be sold? The mainstream answer is yes because of Say’s law. This states that supply creates its own demand because the production of goods also produces the income with which those goods will be bought and because all the income will be spent. The latter point, namely the full expenditure of the whole income, is the result of market mechanisms capable of ensuring that the income not consumed, and therefore saved, is channelled entirely into investment.

The supply of goods produced will consist of consumer goods and capital goods. The demand for the former is explained here on the assumption that households generally prefer to consume their available income in the present rather than the future. This means that they will be disposed to forgo part of their present consumption only if this act of forgoing or saving is remunerated by interest. The task now is therefore to see whether there exists a mechanism capable of ensuring that saving and investments are equal at every level of saving.

According to the mainstream economists, this mechanism exists and can be identified as the movement of the interest rate on the market for loanable funds.

When the interest rate drops, it becomes advantageous for entrepreneurs to increase their volume of investment. There is always a level of the interest rate such that the volume of investment is capable of absorbing any amount of savings. The aggregate demand for (consumer + capital) goods thus comes to depend on the level of the *real* interest rate, the interest rate being regarded here not as a monetary phenomenon – a variable affected by monetary policy – but as a price determined on the market for loanable funds

As readers will have noted, money is never mentioned in the argument outlined so far. This is because money is *neutral* in the mainstream theory, in the sense that it supposedly does not affect the real magnitudes of the economy, namely employment and production.

The monetary mass available in the economy for the exchange of the goods produced is equal to the amount of money introduced into the economy by the monetary authority (multiplied by its speed of circulation, the number of times a banknote circulates in the economy in the period considered, Mv). Juxtaposed to this monetary mass is the monetary value of the real income (made up of the consumer goods and capital goods produced), which is given by the magnitude of production in physical terms multiplied by the general level of prices (pY). Since the real income is here the income of full utilisation, as explained above, it is given. At this level of income, given the amount of money available, the level of prices will be univocally determined, and the only effect of an increase or decrease in the monetary mass will be a rise or fall in the general level of prices. (This is why the reaction of a mainstream monetary authority to inflation will be to reduce the monetary mass or raise the interest rate.) This view is known as the quantity theory of money (encapsulated in Fisher’s equation: $Mv=pY$). This step is represented in figure 1 by the hyperbole function obtained by regarding Mv as a constant, i.e. $Y=Mv/p$.

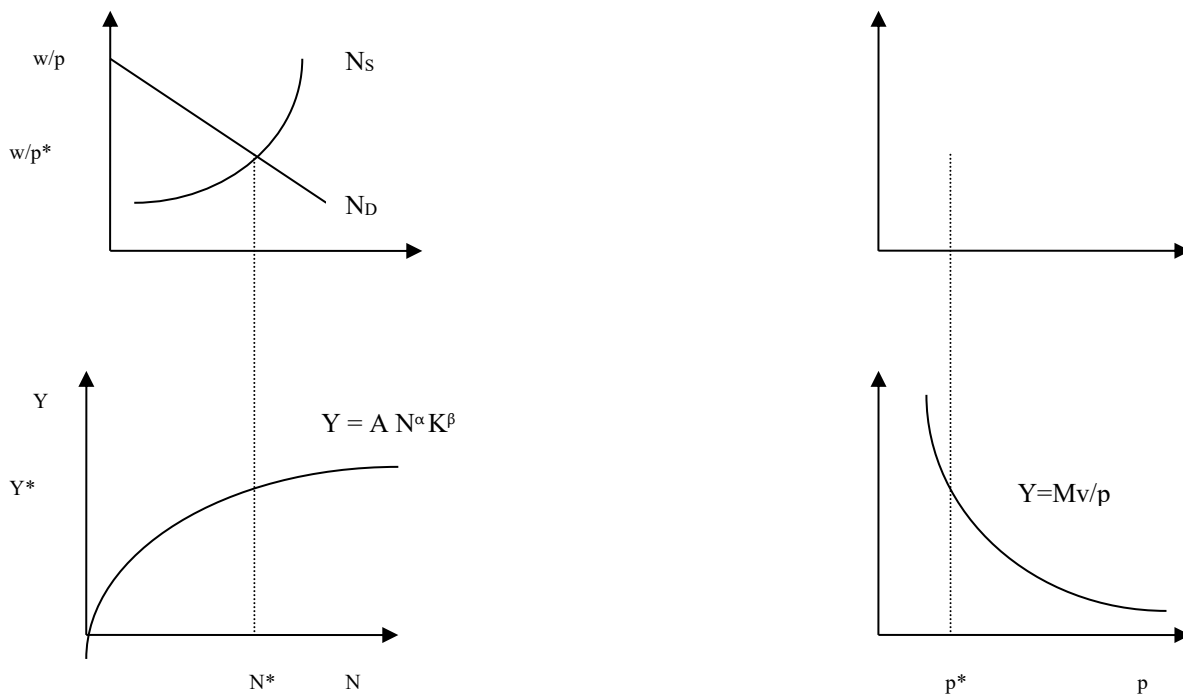


Figure 1: The mainstream aggregate general economic equilibrium.

The mainstream argument thus runs as follows. The level of real wages corresponding to full employment (the absence of involuntary unemployment) is determined on the labour market (w/p^*). → Given equilibrium employment (N^*), the level of production and income is determined as the highest possible given the resources of labour and capital available (Y^*). → The rate of real interest corresponding to equality between investment and saving and therefore between aggregate supply and aggregate demand is determined on the market for consumption and investment goods. → The amount of money is neutral, meaning that it has no influence on the real economy (on employment and production) but only on the general level of prices. → The distribution of income between wages and profits is proportional to the respective productivity of labour and capital.

The system will converge to full-employment equilibrium and return to it automatically in the event of disturbances from outside.

Even though the reasoning outlined here is clearly present in most of the textbooks where students learn the basics of economic theory, many colleagues will turn up their noses and accuse us of excessive approximation or insufficient knowledge of the results presented in journals with a high impact factor. In order to refute such accusations, it is sufficient to recognise a concrete fact: there is no dominant economic model to be found in the work of the economists who engage in high theory today or seek to contribute to the debate on economic policy with their empirical studies⁸.

⁸ A division between schools of thought, which are generally recognised and presented to Ph.D students, except in very rare cases, is accepted within the mainstream. On the one hand, we have the economists faithful to the New Classical Macroeconomics, who believe that economic actors are in fact always capable of correctly interpreting the nature of the shocks affecting the economy. In particular, the unemployed are described as workers who rationally opt for leisure rather than work – for free time now rather than in the future – on the basis of the ratio of their present wages to what is considered ‘normal’ as well as their expectations concerning future prices and nominal wages. The simultaneous movements of prices and output observed in historical series are explained as temporary and fortuitous confusions between variations in relative prices and the price level, i.e. between variations in the real wage and the level of nominal

This does not mean, however, that a dominant idea about the requisite training for undergraduate, graduate and above all postgraduate economists does not exist and is not put into practice.

3.1 –What are the consequences for international monetary economics?

Orthodox economists claim to have formulated a satisfactory explanation of exchange rate determination based on ‘fundamental’ forces. The so-called ‘fundamentals’ are variables that allegedly ensure an efficient market and the optimal allocation of world resources if only they are allowed to determine exchange rates (Harvey, 2001). Following this line of thought, the core mainstream exchange rate theory is based on purchasing power parity (PPP): once exchange rates are taken into account, the average price of goods and services worldwide should be equal. If the relationship does not hold, it means that commodities are cheaper in one area than in the other. This sets natural forces into motion (i.e. arbitrage) that will re-establish equality. It is therefore the balance of trade that drives the exchange rate. In other words, there is a systematic tendency for the balance of trade to reach equilibrium. In particular, portfolio capital flows play no role.

The joint consideration of purchasing power parity and the quantity theory of money makes it possible to draw some simple policy implications:

1. Central banks should control the amount of money supplied (directly or indirectly).
2. They should set money supply targets by considering worldwide natural rates of unemployment.
3. Worldwide velocities of money should also be monitored by central banks.

It follows that if central banks are able to coordinate such interventions, not only inflation, but also the volatility of exchange rates can be kept under control.

A corollary is that unstable exchange rates are caused by unstable policies and not by destabilising speculation.

It is widely believed that, as long as an economic system is healthy, efforts must focus first and foremost on keeping the rate of inflation down. It is Taylor’s rule that dominates: ‘The policy rule in [the Taylor] equation has the feature that the federal funds rate rises if inflation increases above a target of 2 percent or if real GDP rises above trend GDP. [...] The 2-percent “equilibrium” real rate is close to the assumed steady-state growth rate of 2.2 percent. This policy rule has the same coefficient on the deviation of real GDP from trend and the inflation rate.’ (Taylor 1993, p. 202)

The concept of an equilibrium rate of inflation is associated with the idea that there is a natural rate of unemployment. As regards the latter, Franco Modigliani – who won the Nobel Prize for economics in 1985 for his pioneering analysis of savings and financial markets, and is amongst

wages. On the other, we have the New Keynesian school of thought, whose development must be recognised as a reaction against the triumph of the counter-intuitive results of Lucas and his pupils. As Paul Krugman recently acknowledged, however, New Keynesians are mostly not immune to the attraction of rational individuals and perfect markets. They appear to exercise great caution in the construction of models that are not characterised by a tendency towards equilibrium even in the presence of market imperfections.

From the 1980s until just a few years ago, the best-known New Keynesian economists, including N. Gregory Mankiw at Harvard, Olivier Blanchard at the M.I.T., David Romer at Berkeley and Paul Krugman at Columbia University, ‘tried to keep their deviations from neoclassical orthodoxy as limited as possible’ (Krugman, 2009).

those most responsible for the success of the neoclassical synthesis⁹ – was once asked, ‘Who decides [the natural rate of unemployment]?’ According to a reliable witness, he answered, ‘Friedman and I do.’¹⁰ Taylor’s rule, and variants of the same maintaining the need for a conservative central banker or the institutionalisation of aversion to inflation, can be understood through reference to the quantity theory of money. At the same time, however, the dominant idea known as the New Consensus, which has triumphed above all within the ECB, is rather that the interest rate can serve as a tool of indirect control over inflation. This presupposes that we proceed as though there were a ‘natural’ rate of interest compatible with the steady-state growth rate in which the full utilisation of resources obtains.

Maintaining price stability is the primary objective of the Eurosystem and of the single monetary policy for which it is responsible, as laid down in article 127 of the Treaty on the Functioning of the European Union: ‘Without prejudice to the objective of price stability’, the Eurosystem shall also ‘support the general economic policies in the Union with a view to contributing to the achievement of the objectives of the Union’. These include inter alia ‘full employment’ and ‘balanced economic growth’. The Treaty establishes a clear hierarchy of objectives for the Eurosystem. It assigns overriding importance to price stability (the ECB’s Governing Council has announced a quantitative definition of price stability as a year-on-year increase in the Harmonised Index of Consumer Prices for the euro area below but close to 2%). The Treaty makes it clear that ensuring price stability is the most important contribution that monetary policy can make to achieve a favourable economic environment and a high level of employment.

⁹ The centrepiece of the Neoclassical-Keynesian Synthesis (or the ‘Neo-Keynesian’ system) was the infamous IS-LM Model first introduced by John Hicks (1937) and then expanded upon by Franco Modigliani (1944). The IS-LM model purported to represent the gist of John Maynard Keynes’s General Theory (1936) in the form of a system of simultaneous equations. One of the startling results of the IS-LM model was that it was unable to obtain the Keynesian result of an ‘unemployment equilibrium’ but tended rather to yield the Neoclassical result of ‘full employment’. Therefore, in order to generate an ‘unemployment equilibrium’ as a solution to this system of equations, the Neo-Keynesians invoked rigid money wages, interest-inelastic investment demand, income-inelastic money demand or some other imperfection of the system. It is therefore referred to as a ‘synthesis’ of Neoclassical and Keynesian theory in that the conclusions of the model in the ‘long run’ or in a ‘perfectly working’ IS-LM system were Neoclassical, but in the ‘short-run’ or ‘imperfectly working’ IS-LM system, Keynesian conclusions held. See Krugman (2009).

¹⁰ See Lucarelli and Lunghini (2012).

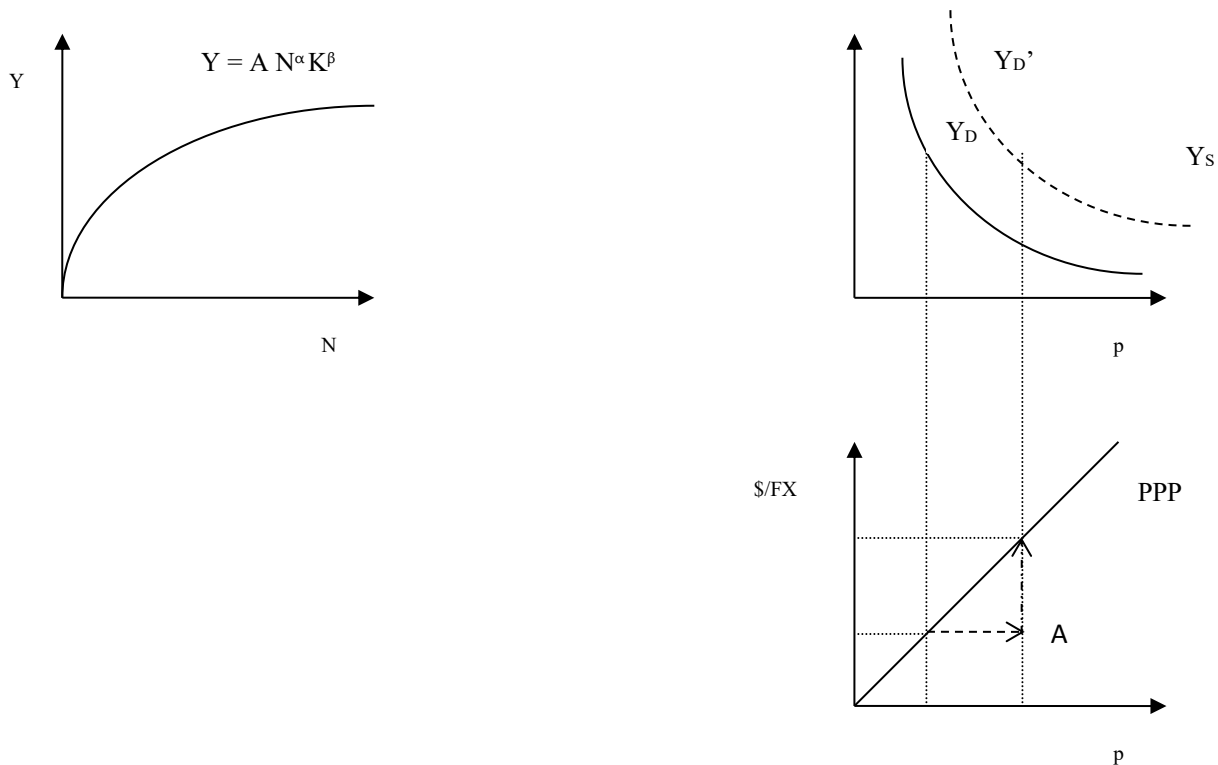


Figure 2: The mainstream aggregate general economic equilibrium in an open economy.

As figure 2 shows, the typical mainstream model in the field of international monetary economics is based on the assumption that trade flows are a function of price variables alone. If p is known and a particular price level is assumed in the foreign country (which defines the slope of the PPP line), the exchange rate is also known. While the basic model considers flexible prices, as we shall see, the dominant theory has attempted to extend these results also to contexts of sticky prices. An expansionary monetary policy will cause a rise in domestic prices. Agents attempt to rid themselves of excess money balances by spending (thereby increasing aggregate demand from Y_D to Y_D') but, as we are already at the full employment level, this only leads to inflationary pressure and depreciation of the domestic currency. Rising prices place the economy at point A, where the domestic economy is experiencing a trade deficit. If we assume that the national price level cannot change without a policy decision by the central bank, then the only variable able to bear the burden of adjustment is the exchange rate: the domestic currency will depreciate. At this point, given PPP, there will be a devaluation of the exchange rate making up precisely for the increase in the flexible prices. The process is instantaneous due to the perfect flexibility of prices and the balancing forces of the market on which PPP rests. These forces are nothing other than the possibility of arbitrage on substitute goods in the absence of transaction costs and tariffs on international trade. It should be noted that the levels of production and employment undergo no variation in this process of adjustment.

Widespread use is made of models based on a pragmatic approach that claims to modify the microeconomic basis of macroeconomic aggregates. In every case, however, the investigations are necessarily developed within one particular framework. The ‘microfoundation’¹¹ always takes

¹¹ The idea is widely held in the more radical mainstream that there is no problem with the microfoundation of macroeconomics, as this constitutes the only scientifically sustainable economic theory: ‘The most interesting developments in macroeconomic theory seem to me describable as the reincorporation of aggregative problems such as

rational economic agents as its starting point in accordance with the analytical tools constructed by the Chicago School, the New Classical Macroeconomics (NMC). In the theoretical space inhabited by rational economic agents – consumers, workers, firms, bankers or policymakers, all described in terms of their objective functions – it is also possible to formalise the presence of specific characteristics that account for failures of the market, such as information asymmetries, externalities and public goods. While the view expressed by Krugman in his now celebrated self-criticism of 2009 may appear unduly severe, if the New Keynesian school of thought unquestionably developed contributions on financial frictions that sought to demonstrate the advisability of a monetary policy not confined to price stability,¹² it is also true that the results thus attained do not challenge the mainstream model in the long run. This subject will be addressed in the following section with reference to the in many respects paradigmatic case of the Dornbusch model, the theoretical framework that still constitutes the backbone of every textbook of international monetary economics today.

3.2 –From stabilising speculation to the empirical failure of the Dornbusch model

Given the implausibility of perfectly flexible prices, and hence the impossibility of accounting for the trend of the principal economic variables of the mainstream model presented in the previous section, orthodox economic theory also took into consideration the possibility of incorporating sticky prices. The non-perfect flexibility of prices became necessary in international economic theory in order to try and explain the short-term trend of exchange rates since the collapse of the Bretton Woods system. During the 1950s and 1960s, as stressed by Parboni (1982) and Krugman (2002), both economists and policymakers began to see exchange rate flexibility in a more favourable light. In line with the theoretical framework sketched out above (see figure 2), Milton Friedman argued in 1953 that the fear of floating exchange rates was unwarranted, the unstable exchange rates of the 1920s having been caused, he claimed, by unstable policies rather than by destabilising speculation. He went on to argue that profit-maximising speculators would always tend not to destabilise but to stabilise the exchange rate. This view had become widely accepted within the economics profession and among policymakers by the late 1960s, a change in attitude that helped to pave the way for the abandonment of fixed rates in 1973. The instability of rates since 1973 has thus been a harsh disappointment. As Krugman (2002) and others recognise, while some of the changes in exchange rates can be attributed to differences in national rates of inflation, the yearly changes have been much larger than can be explained by differences in inflation rates or in other variables such as different growth rates in the money supplies of different countries.

Why are exchange rates so unstable? One successful explanation that today constitutes the core of mainstream courses in international monetary economics¹³ was originally formulated by the MIT economist Rudiger Dornbusch (1976): even without destabilising speculation, exchange rates will be highly variable because of a phenomenon that he called ‘overshooting’. The Dornbusch model can be seen, in the version taught to undergraduates,¹⁴ as an IS LM model in an open economy on the assumption of PPP and uncovered interest rate parity. In this framework, let us suppose that a country increases its money supply. In the long run, this must cause the value of its currency to decrease. In the short run, it will lead to a lower interest rate on securities denominated in that currency. This is due to the fact that prices are rigid and the real supply of money therefore varies.

inflation and the business cycle within the general framework of “microeconomic” theory. If these development succeed, the term “macroeconomic” will simply disappear from use and the modifier “micro” will become superfluous. We will simply speak, as did Smith, Ricardo, Marshall and Walras, of economic theory.’ Lucas (1987, pp. 107–8).

¹² See for example Bernake and Gertler (1989) and Greenwald and Stiglitz (1993).

¹³ See Krugman, Obstfeld and Melitz (2009), chapter 15.

¹⁴ See Obstfeld and Rogoff (1996) for a more analytically complex and dynamic discussion.

Being perfectly rational and consistent with respect to the model presented in the previous section, the agents know that prices will rise in the long term and bring the real supply of money back exactly to the initial level. Given this knowledge, their adjustments as regards the future exchange rate are made as soon as the supply of money increases. This means an increase in production due to the increase in exports prompted by the lower rate of interest and ensuing devaluation of the exchange rate owing to uncovered interest rate parity and the change in expectations as regards the exchange rate. The IS curve will be driven to the right by the trade surplus. When prices have risen, production will return exactly to the initial level. The leftward move of the LM will also cause an increase in interest rates that will restore the balance of payments through a rise in the exchange rate. In short, what the Dornbusch model envisions in the short term is a drop in the interest rate, a devaluation of the exchange rate, an increase in production and a balance of trade surplus. In the medium term, the system will return to the initial level of production, the exchange rate will rise with respect to the short period but remain lower than the initial period (PPP must be respected as well as the changed expectations as regards uncovered interest rate parity) and the interest rate will also return to the initial level. As we can see, the end effect of monetary expansion is confined to exchange rate devaluation and an increase in prices. There is no real effect. Dornbusch thus accounts for the excessive variability of exchange rates in the short period with the mechanism of overshooting, which is nothing other than the gap in devaluation between the short and medium periods. As explained in Krugman, Obstfeld and Melitz (2009, p. 408): ‘In a hypothetical world where the price level could adjust immediately to its new, long-run level after money supply increased, the dollar interest rate would not fall because prices *would* adjust immediately and prevent real money supply from rising. Thus, there would be no need for overshooting to maintain equilibrium in the foreign exchange market. The exchange rate would maintain equilibrium simply by jumping to its new, long-run level right away.’ This phenomenon is a direct consequence of the short-run rigidity of the price level. The overshooting hypothesis helps explain why exchange rates are so much more unstable than inflation rates or money supplies.

While the Dornbusch model is highly elegant and is still accorded undisputed prominence in mainstream courses of international monetary economics, the empirical results obtained on its basis range from overshooting and delayed overshooting to undershooting and no overshooting whatsoever. In other terms, the model proves incapable of accurately forecasting exchange rate movements. In particular, the result of the comparison of time series and structural models of exchange rates, including the Dornbusch model, in terms of their out-of-sample forecasting accuracy carried out by Meese and Rogoff (1983) is that a random-walk model predicts major-country exchange rates during the floating-rate period just as well as any of the others tested. As the authors significantly note (p. 3): ‘the structural models fail to improve on the random walk model in spite of the fact that [authors] base their forecasts on actual realised values of future explanatory variables’. It should be stressed that a random walk, as the name suggests, is a process whereby randomly-moving objects wander away from wherever they started. In the case of the exchange rate, at any moment in time this is as likely to rise as it is to fall. The authors’ results mean either that the mainstream models are simply wrong or that mainstream scholars incorrectly tested the short-term forecasting capacity of what were essentially long-term processes (Harvey, 2009, p. 30).

A shift in mainstream thought had definitely taken place by the mid-1990s because the overwhelming evidence against the core concept had become irrefutable. In addition to the list of failures of models of exchange rate determination, new research involving technical analysis and testing of direct observations of market expectations rejected market efficiency and rational expectations.¹⁵ Current mainstream thought assumes that the errors lie in details rather than in the core and maintains that the fundamentals-based approach characterises long-term exchange-rate

¹⁵ See Orléan (2008) for a review of the literature on financial economics. See also Di Filippo (2011).

determination. Several economists have suggested that non-fundamental movements are relevant in the short run but are caused by ‘irrational’ forces and therefore not a suitable subject for economic analysis. Fundamentals have survived, but the short run has been abandoned.

4 – Towards an alternative paradigm

A return to Keynes would be helpful because what mainstream economists are in the habit of calling ‘irrational’ should actually be seen and analysed as conventional judgements. As Keynes wrote in a well-known letter to Roy Harrod:

I also want to emphasise strongly the point about economics being a moral science. I mentioned before that it deals with introspection and with values. I might have added that it deals with motives, expectations, psychological uncertainties. ... It is as though the fall of the apple to the ground depended on the apple’s motives, on whether it is worth while falling to the ground, and whether the ground wanted the apple to fall, and on mistaken calculations on the part of the apple as to how far it was from the centre of the earth. (Keynes, 1938)

This excerpt identifies precisely the core concepts (motives, expectations and psychological uncertainties) that create problems for mainstream explanations of exchange rate determination. Keynes’ approach leads to three main results:

- first, fundamentals are confined to being whatever the market participants decide they are. The specification of fundamentals in mainstream economic models has been restricted to those factors that ‘should’ – according to economists – determine exchange rates;
- second, since ‘efficiency’ and ‘optimality’ are a function of the independent, subjective and unobservable utility functions of all market participants, it can never be understood whether the empirical failure of a fundamentals-based model occurs because the basic theory is flawed or simply because the fundamental variables have been incorrectly specified;
- third, the awareness that the ever-greater internationalisation of capital has been accompanied by the entrance of more and more heterogeneous players into the foreign exchange market with the result that the specification of the fundamentals has become increasingly dishomogeneous and erratic (Harvey, 1993).

The year 1973 marks the turning point. Exchange rates between currencies have been highly unstable since the collapse of the Bretton Woods system of rates fixed at levels determined by governments, which was in force from 1946 to 1973. The ‘floating’ rates in existence since 1973 are instead determined by people buying and selling currencies in the foreign-exchange markets. Their instability came as a surprise and disappointment to many economists and businessmen, who had not expected them to create so much uncertainty. It would not, however, have surprised the founders of the Bretton Woods system, who had a deep distrust of financial markets. The previous experience with floating rates in the 1920s had been marked by massive instability, as Keynes and other scholars were well aware.

4.1 – Keynes’s model

Unlike a model of general economic equilibrium, Keynes’s argument is based on the idea that the markets for goods and for money are not independent from one another. The latter has an effect on the former through the influence of the interest rate on investments, and the former – by determining the level of production and income – has an effect on the latter through the demand for money required for transactions.

In Keynes’s view, the interest rate is determined not by real factors but by purely monetary phenomena. The task is therefore to explain the historical, institutional and conventional circumstances that influence the state of the money market. The relation between the demand for money and the interest rate depends on speculative motives, i.e. on the decision to hold resources in

liquid form in order to take advantage of future expected changes in the rate of interest. Following chapter 15 of the *General Theory*, the demand for money for speculative motives depends on the relation between the current interest rate and expectations as to a 'normal' or 'safe' rate. If the current interest rate is below the normal rate, agents will generally expect it to increase (and hence bond prices to fall). As a result, they will prefer to hold money rather than securities and the speculative demand for money will be high. Therefore, *speculative demand is inversely proportional to the interest rate*. It is zero when interest rates are very high because all the agents expect them to drop to a 'normal' level and hence prefer to hold securities in order to enjoy the capital gain made possible by the increase in their market prices. Conversely, there will be a very low level of the interest rate at which the expectation that it will rise, and that hence the market price of bonds will fall, is so general that all agents will prefer to hold cash.

An expansive monetary policy therefore proves ineffective in this situation, which in literature has come to be called a *liquidity trap*, and which can be represented by a flattening of the money demand curve below a certain level of the interest rate (or, in some interpretations, in correspondence with the zero lower bound).

However, this is not the only situation described in the *General Theory*, in which monetary policy may be ineffective in controlling the rate of interest. There is at least another instance that deserves to be mentioned, in which the demand for money may expand indefinitely, absorbing any quantity of money issued by the central bank and preventing the interest rate from falling: when money is demanded not in response to expected increases in the rate of interest (following the speculative motive described above), but as a hedge against unexpected changes in the rate of interest (in connection with what Keynes calls the precautionary motive). In other terms, economic actors may wish to hold money (that yields no interest) rather than bonds (that yield a positive interest), whenever they face the possibility of unexpected expenditures and they are uncertain as to how much it would cost them to convert their credits or securities into cash at that moment.¹⁶ Indeed, as Keynes writes in chapter 13 of the *General Theory*, uncertainty as to the future of the interest rate is the only intelligible explanation of the existence of a demand for money.

In an article written one year later with the intention to lay emphasis on the main tenets of his new paradigm, Keynes insists on the uncertainty of the future as a major determinant of the demand for money. 'Why should anyone outside a lunatic asylum wish to use money as a store of wealth?' Keynes's answer is that, 'partly on reasonable and partly on instinctive grounds, our desire to hold money as a store of wealth is a barometer of the degree of our distrust of our own calculations and conventions concerning the future. Even though this feeling about money is itself conventional or instinctive, it operates, so to speak, at a deeper level of our motivation. It takes charge at the moments when the higher, more precarious conventions have weakened. The possession of actual money lulls our disquietude; and the premium which we require to make us part with money is the measure of the degree of our disquietude.' (Keynes (1937), in *TCW*, vo. XIV, pp. 115-116).

Now, this precautionary motive of the demand for money may generate a second type of liquidity trap, which differs from the one determined by the speculative motive, not only in its origin, but also in its implications. This second liquidity trap depends on a (sudden and discrete) change, not of the rate of interest, but of the uncertainty concerning the future rate of interest. It involves an increase in the first component of the demand for money, associated with the transaction and precautionary motive (L_1 in Keynes's notation) and not of the second component, associated with the speculative motive (L_2). It may be represented not by a flattening of the money demand curve for low levels of the interest rate, but by a shift towards the right of the money demand curve. As a consequence, while the first type emerges only in correspondence with levels of the interest rate that are close to or even equal to zero, the second type may occur at any level of the interest rate.

¹⁶ This case is highlighted, and the circumstances of its occurrence are analyzed, in Fantacci and Sanfilippo (2019).

Therefore, in stark contrast with all the previous tradition, Keynes understands the interest rate not as a reward for saving or abstinence as such. In point of fact, if people hoard their savings in the form of money, they earn no interest even though they save exactly as much as before. The interest rate is, instead, a recompense for forgoing liquidity for a certain period, and hence for temporarily giving up the convenience associated with the possession of money consisting in the immediate command over its power to discharge debts. It measures the reluctance of those who possess money to relinquish their control over its liquidity, i.e. its prompt convertibility in any other kind of good or asset. It is not the 'price' that establishes equilibrium between the demand for resources to invest and willingness to abstain from present consumption but rather the price that balances the desire to hold wealth in the form of money and the amount of money available.

The causal order of Keynesian relations thus presents itself as follows. First of all, it is necessary to consider the factors that determine the level of effective demand and investments, namely expectations, which can be taken as exogenous, and the level of the interest rate, which depends, given the liquidity preference, on the supply of money. Investments depend more precisely on the marginal efficiency of capital (which can be interpreted as the relation between the expected flow of returns on a capital good and its production cost) and the rate of interest. An investment is worthwhile to the extent that its marginal efficiency is greater than the interest rate on the market.¹⁷ Firms base every investment decision on the current rate of interest and on expected returns. It is important to underline that, in the *General Theory*, the marginal efficiency of an investment is defined in terms of *expectations* on its returns. It is a subjective variable and therefore hardly susceptible of prior determination. Moreover, being intrinsically dependent on expectations, it is also exposed to the radical uncertainty of the future, and hence to variations in the state of confidence in the possibility of reliably anticipating the future.

Effective demand (ED) determines the level of income and hence of saving, which serves to finance the autonomous demand constituted by investments. In other terms, we could say, it is not savings that create the possibility to invest, but it is rather investments that create the savings necessary to finance them.

In a certain sense, the money market precedes the market for goods in causal order. This order can be represented as follows (see figure 3). Equilibrium on the money market depends on expectations, which influence the demand for money for speculative purposes, $L(i)$,¹⁸ and on the stock of money fixed by the central bank. The conventional views established on the financial markets play a crucial role at this stage: the position of the liquidity demand curve, $L(i)$, depends on the degree of confidence that market actors entertain in the calculations on which they base their forecasts. This set of circumstances determines the level of the interest rate, i . → The amount of investment corresponding to a certain interest rate depends in turn on expectations concerning the returns on capital,¹⁹ $I(i; E)$. → Together with the amount of consumption, which depends on the community's propensity to consume, $C=C_0+cY$, the volume of investment determines the level of income. → The level of income, Y , determines the level of employment, N .

It should be noted that equilibrium is attained on the markets for money and goods without this necessarily entailing a full-employment equilibrium in the labour market.

For Keynes, the labour market cannot be described as a market that tends autonomously towards equilibrium due to the fact that the demand for and supply of labour both depend on the same

¹⁷ See Variato (2004: 214).

¹⁸ Here we define the demand for money only with respect to the speculative motive for simplicity sake. We want to show students the logical sequence through which the Keynesian model is articulated. We do not therefore indicate the first and second effects that the income level determines on the money demand as indicated by the Keynesian theory. We relax this hypothesis in the open economy model.

¹⁹ If we were to follow the full argument developed by Keynes in Chapter 12 of the *General Theory*, we ought to add that mathematical expectations are necessarily supplemented by "animal spirits", i.e. spontaneous optimism, urge to action rather than inaction (Keynes 1936: 161-2).

variable, namely the wage rate. Hence the essential difference with respect to the mainstream approach. Keynes assumes neither the full utilisation of productive capacity nor full employment of labour. It is in fact possible and indeed normal for the economic system to be in equilibrium despite the existence of involuntary unemployment.

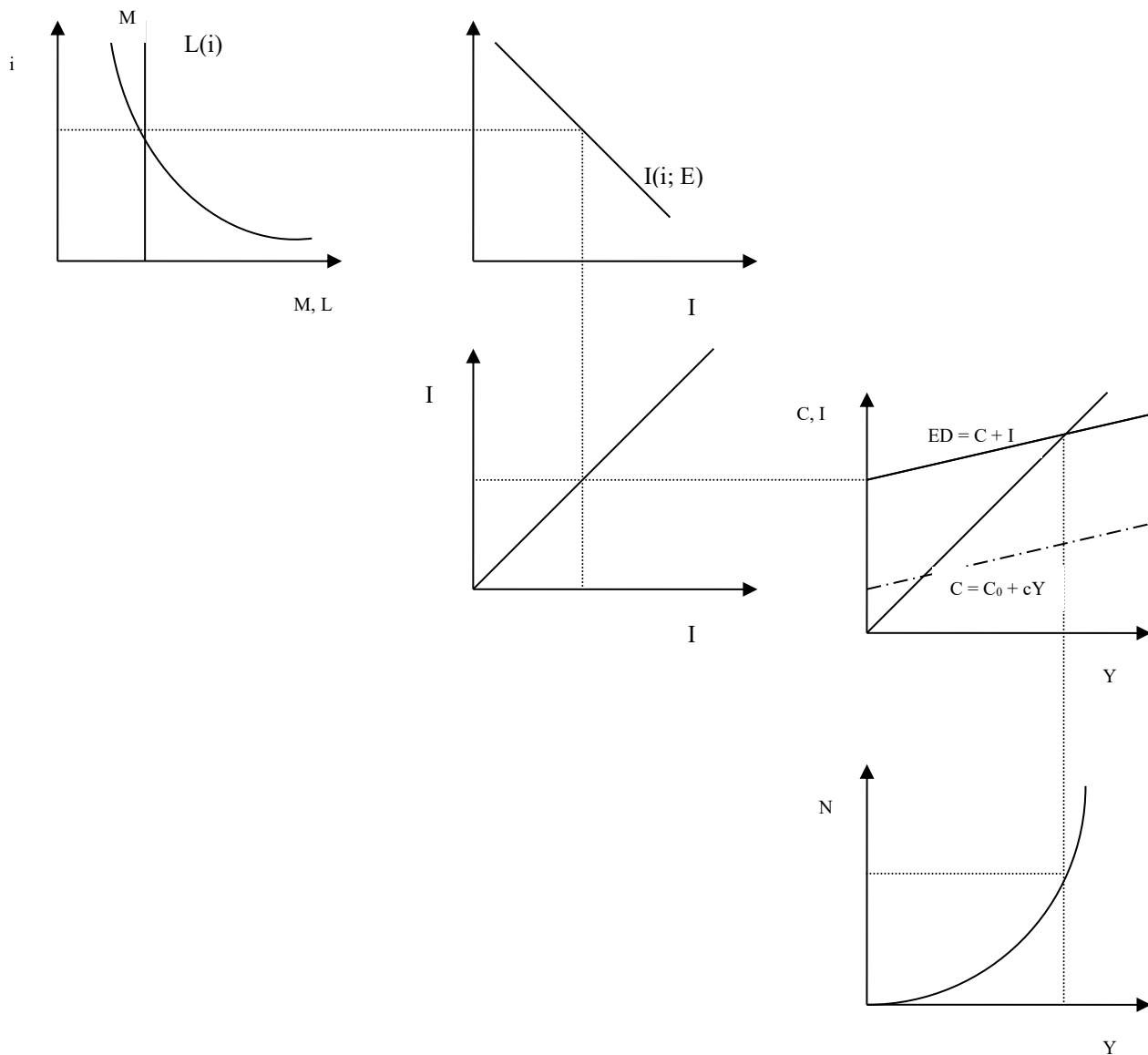


Figure 3: Keynes's model in a closed economy.

The reasoning proposed by Keynes in the General Theory presupposes that the monetary policy tool employed by the central bank is the money supply. In this case monetary policy involves direct control of the money stock, leaving the interest rate determined by demand.

This aspect of the Keynesian scheme must be modified to take into account the monetary policy practice implemented by the majority of the central banks today. This entails that the discount rate is set by the central bank. In this way the monetary authority directly controls the interest rate by letting the stock of money be determined by demand. The implication is that the money supply is

endogenous. In the next section we internalize this institutional feature in an open economy model.²⁰

4.2 - What are the consequences for international monetary economics?

While touching on the fact that freely floating exchange rates are likely to be quite volatile, as market participants adjust portfolios in response to changes in expectations, most post-Keynesian scholars are primarily concerned with the macroeconomic effects of various international payment systems. The details of exchange rate determination are usually ignored. In our view, the starting points for a truly Keynesian approach to international monetary economics are the role of expectations and the analysis of the demand for liquidity. As shown in figure 3, Keynes sees investments as depending on expectations and on interest rate. As will be shown, the introduction of even just a few elements of the complex Keynesian analysis radically alters the orthodox model and offers the undergraduate student an opportunity to account for structural imbalances in an open economy. According to Keynes, the demand for liquidity is determined by three motives:

1. The transactions motive. People prefer to have liquidity in order to cover basic transactions, as their income is not constantly available. The demand for liquidity is determined by the level of income: the higher the income, the greater the demand for money to make more purchases.
2. The precautionary motive. People prefer to have liquidity to cope with unexpected expenditures. The amount of money required for this purpose increases as income rises.
3. The speculative motive. People retain liquidity in order to speculate that bond prices will fall. When the interest rate drops, the demand for money increases until it rises again and thus causes the price of existing bonds to fall. The interest rate and the demand for money are therefore inversely proportional, given the state of confidence.

Analytically we indicate the money demand as $L(i,Y)=L_1(Y)+L_2(i)$. As anticipated, we consider the stock of money as endogenous. According to the theory of the endogenous money, central banks set the official discount rate and not the money supply, the latter is the product of the interactions among firms, individuals and banks. We adhere to the institutionalist approach, therefore we assume that there is a negative relationship between the amount of credit granted by the banking system and the official interest rate. Compared to the orthodox models, the elasticity of investments to the interest rate is less marked and the role of expectations in determining the level of investments is fundamental. Although in the real world the central bank official rate is not the interest rate at which banks grant credit nor the rate at which international investors overturn their portfolios, for simplicity's sake we consider a unique rate set by the Central Bank.

Expectations and the state of confidence, by determining the institutional and conventional nature of the interest rate, therefore do matter in the determination of exchange rates. It should also be borne

²⁰ We are aware that it is still a simplification. This depends on the fact that the means of payment used in the monetary economy are different. An important part of them is issued by commercial banks, non by the Central Bank. To explicitly recognize this aspect it would be necessary to distinguish between cash issued by the Central Bank and bank money regulated by commercial banks. The balances of bank deposits available to households and business represent bank money, that is a financial asset for the holders of the balances and a bank liabilities at the same time. The Central Bank does not fully control the stock of money by setting the reference interest rate, but only the monetary base (cash plus bank reserves).

in mind that full employment income cannot be defined as the long-run equilibrium. The rate of interest can influence both the velocity of circulation of money, v , which is not constant, and income (through I). As $Y=C(Y)+I(i, E)+G+[NX(Y)]$, expectations play a crucial part in determining, not only the rate of interest (i) itself but also the national income (through I). Expectations are also important in the determination of capital flows, perhaps the most relevant variable as regards the volatility of exchange rates.

Based in part on Keynes's view of asset markets, it is possible to explain exchange rates by outlining the structure of the market and the behaviour of currency dealers (focusing on how the market *does* work rather than on how it *should*) (Schulmeister, 1988). The peculiar pattern of price movements (a series of upward and downward runs around a mean) is the result of bandwagon and cash-in effects and the fact that currency dealers simultaneously hold both short and long-term expectations about future prices. Short-run volatility is due to the weak nature of the relevant expectations. In the long run, rates fluctuate in response to more stable factors such as current account imbalances and interest rate differentials.

Figure 4 shows an extension of Keynes's model with the links between the rate of interest determined as a monetary variable and the foreign currency market represented in the first two diagrams. It should be specified that the spot exchange rate (measured as $\$/FX$) is a function of exports, imports, capital inflows and capital outflows. The forces driving the latter are assumed to be interest rates and agents' expectations of future currency movements: as domestic interest rates rise, domestic assets become more attractive; as foreign interest rates rise, domestic assets become less attractive; as the expected value of the domestic currency declines, market participants shift from domestic to foreign assets. FXM has a negative slope because the rise in domestic interest rates leads to a currency appreciation (fall in $\$/FX$) as agents buy the domestic currency (the dollar in our case) in order to obtain interest-bearing assets. The role of the conventions characterising operators on the currency market can therefore influence the monetary policies implemented by the central banks. In particular, movements of the interest rate can have effect of the opposite sign on domestic investments and incoming flows of capital.

The current account is illustrated in the diagram below the FXM curve. BTFX is the locus of points showing the combination of nominal income and exchange rate that would yield balanced trade for the domestic economy. A rise in the exchange rate produces an improvement in the balance of trade, whereas a rise in nominal income causes deterioration.

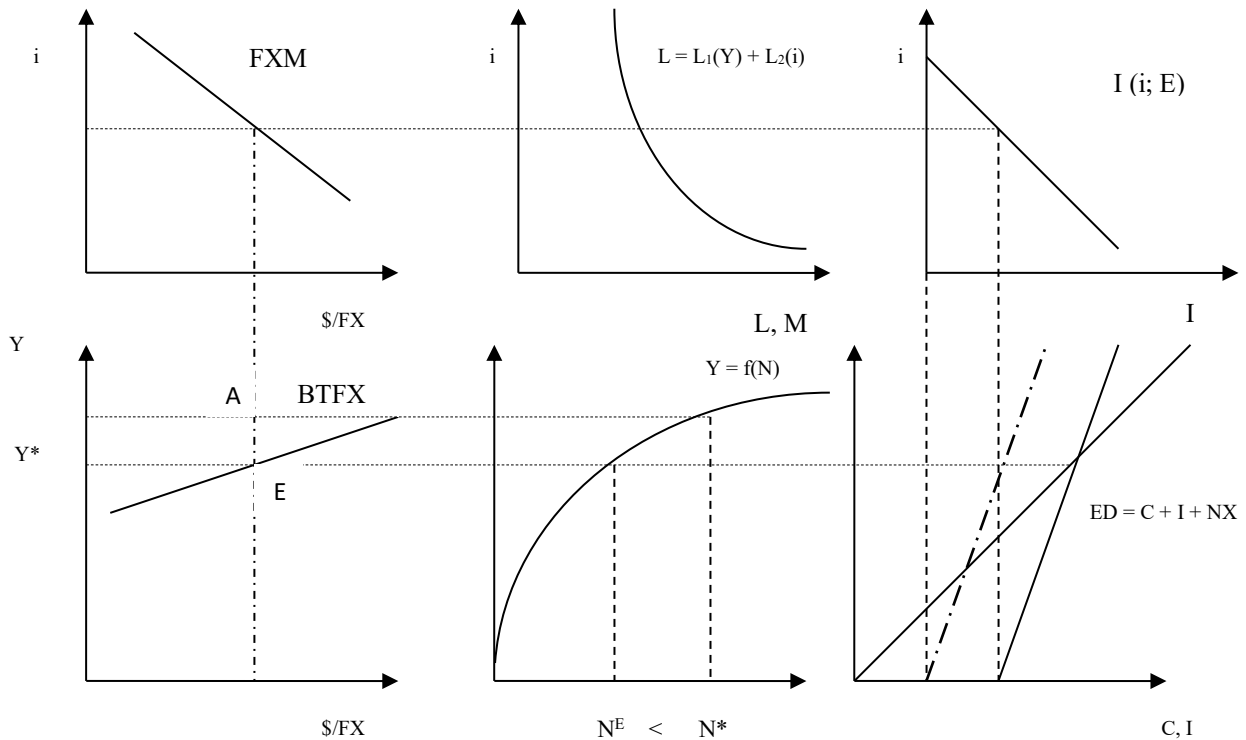


Figure 4: Keynes's model in an open economy.

It should be stressed that movements in the interest rate affect both flows of capital and internal investments. At the same time, while an increase in the interest rate leads to an increase in the flow of foreign capital, it discourages internal investment and leads to a drop in effective demand.

The fact that, contrary to the claims of Harvey (2009), the relation between the FXM curve and effective demand is mediated by the demand for money and the investment curve helps us to explain both the liquidity trap and the importance of the schedule of marginal efficiency of capital (as shown in figure 6). Given the working of the schedule as an expression of the expectations of entrepreneurs, there is no reason to assume that the relation between interest rate and investment is linear. As in the previous section, we determine the effective demand ED as the sum of consumption and investments to which we add algebraically the trade balance obtained on real international markets. We insert the graph of the aggregate production function between the graph of BTFX and that of the ED. On the basis of the Keynesian theory we consider the labor productivity decreasing, moreover we hypothesize that companies adjust the level of employment to the effective demand and not vice versa as for the neoclassical model.

In line with a truly Keynesian perspective,²¹ the approach illustrated in figure 4 shows that the possibility of preserving full employment and balanced trade for a country is determined “by accident or design”. Indeed full employment and balanced trade are two political aims affected by the state of confidence of long-term expectations.

In our model there is often a trade-off between domestic stability and international equilibrium. Figure 5 shows an economy characterized by the balance of payments in a state of equilibrium and underemployment of labor force. In order to increase the level of employment, the central bank

²¹ See Parboni (1982) for the Keynesian approach to international economics in the early 1980s.

lowers the interest rate. Given the negative relationship between the interest rate and investment, the monetary policy has two effects. On the one hand, it increases the aggregate level of investments and consequently of the effective demand. On the other hand, it induces a depreciation of the exchange rate due to speculative capital movements on international financial markets.

As far as real international markets are concerned, the trade balance is the result of two opposing forces. In the first instance, the increase in effective demand leads to a worsening of the trade balance up to point A, corresponding to a trade deficit. This is due to the increase in imports. At the same time, the exchange rate depreciation tend to increase exportations but in a measure not able to guarantee the balance of payments equilibrium (point B). Income growth increases the demand for money by shifting the $L(i,Y)$ curve to the right, differently to mainstream models the shift in the money demand curve induces a change in the total amount of money and not in the interest rate.

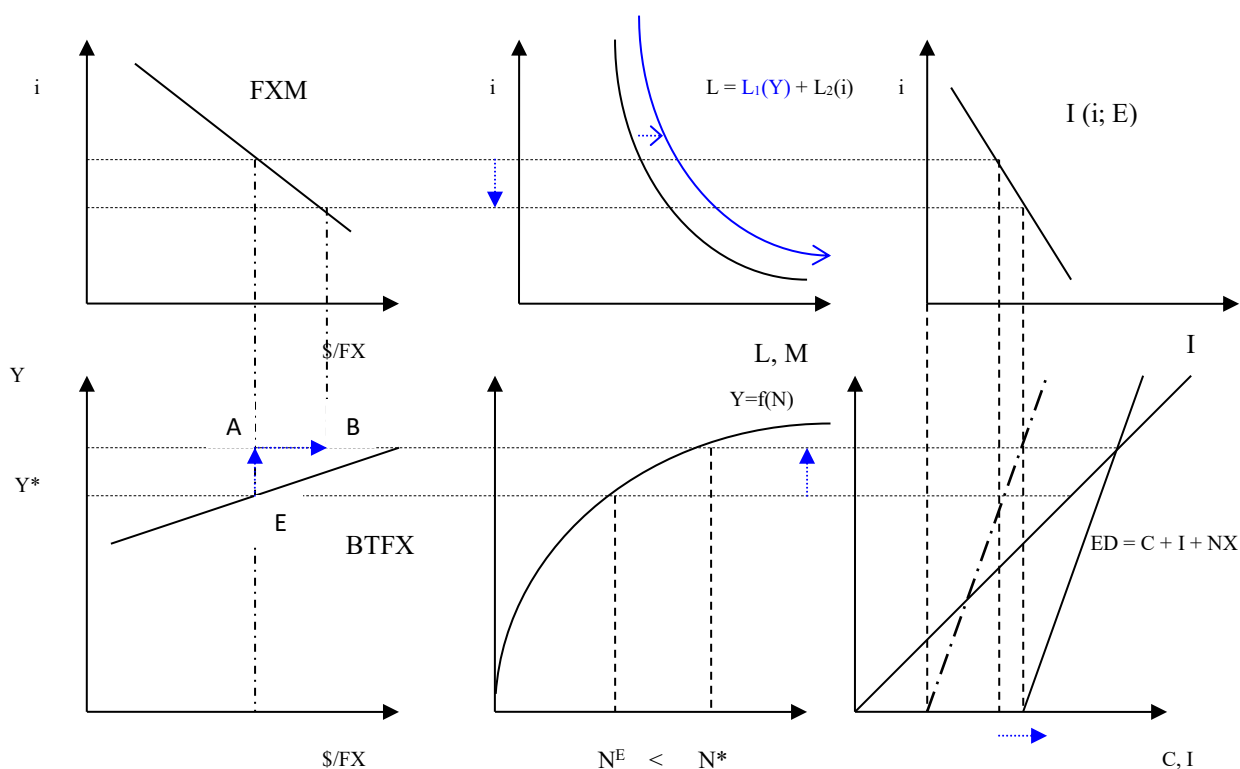


Figure 5. A reduction of the official interest rate

Finally, we present a case study concerning the liquidity trap. In order to make the representation more realistic, we modify the curvature of the function that identifies the relationship between interest rate and investments. Shaped in this way the relationship is not linear, therefore a decrease in the interest rate does not always have the same effect on the decisions of the entrepreneurs; below a certain threshold, when the interest rate decreases, the level of investment is not affected.

The demand for money is slightly modified in order to keep the same vertical asymptote when the curve shifts to the right. From the economical point of view, the asymptote indicates the level of

demand for money devoted to transactional purposes²². Ceteris paribus, the lowering of the interest rate involves a depreciation of the exchange rate that leads to an improvement in the trade balance. Nevertheless, the improvement is not sufficient to restore the balance of payments equilibrium. After the first interest rate lowering, full employment is not reached. Then the second lowering occurs, but it has no effect on the level of investments and therefore it does not lead to an increase in the level of employment.

Summarizing, our simple case of liquidity trap in an economy characterized by endogenous money confirms that policy makers cannot aim to obtain at the same time the internal first best and the equilibrium in balance of payment. Moreover, the internal goal of achieving full employment could also be unreachable.

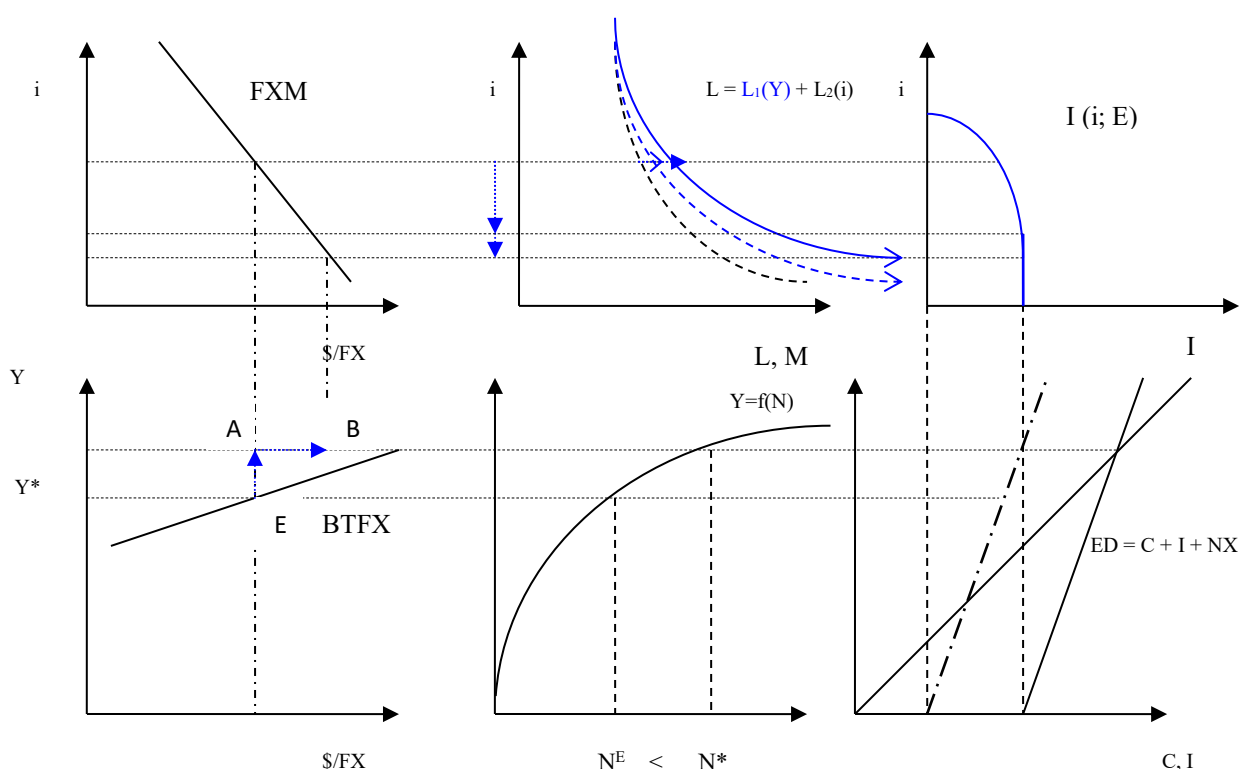


Figure 6. The Liquidity Trap

²² The graph is an approximation. After the first interest rate lowering, we should have noticed a shift of the vertical asymptote. For what concerns the second interest rate lowering, the increase in the demand for money is due only to speculative purposes and therefore the asymptote does not change.

5 – Concluding remarks

The paper has a dual purpose. On the one hand, it intends to show how the mainstream undergraduate models on exchange rate determination fail to incorporate structural imbalances in the balance of payments. On the other hand, it aims to present a simple Keynesian model in which balance of payments equilibrium is reached by chance, or at the expense of other policy objectives such as full employment.

In particular, the paper shows that the mainstream approach is based on the implicit assumption of continuous full employment, which then leads to the argument that the exchange rate is driven by the flow of trade alone, and that trade balance is always restored. Different models with analytical characteristics belonging to the same research paradigm are possible and in circulation for more advanced students. Differently calibrated versions of the same models capable of leading to unstable or even multiple equilibriums are also possible. The factors of disturbance responsible for the substantial differences between one model and another are, however, always supposed to be absorbed in the long run, thus giving rise to the traditional results that are emphasized in mainstream textbooks.

In actual fact, post-Bretton Woods financial markets are characterised by extremely rapid reversals in capital flows that are capable of accounting for exchange-rate volatility - the volatility that Dornbusch's elegant exchange rate overshooting hypothesis, which reigns supreme in the most fashionable textbooks of the discipline, seeks to explain without, however, obtaining robust empirical confirmation.

The post-Keynesian approach leads to a different view of exchange rate determination that is able to explain global imbalances. Important and independent roles are assigned to the financial sector and to agents' expectations, assuming neither full employment nor balanced trade over the short or long run, and viewing the economy as a historically-dynamic rather than static system. While this is unquestionably no more than a preparatory work in the field of economic theory, the authors regard it as capable of providing students with important stimuli to consider the institutional flaws of the current international arrangements, and the institutional structures required for the international monetary system of the future.

References

- Amato, M. and Fantacci, L. (2014), "Back to which Bretton Woods? Liquidity and Clearing as Alternative Principles for Reforming International Money", *Cambridge Journal of Economics*, 38(6): 1431-1452.
- Bernanke, B.S. (2005), "The global saving glut and the U.S. current account deficit", *The Sandridge Lecture*, Virginia Association of Economics, Richmond, VA. (March 10th).
- Bernanke, B.S and Gertler, M. (1989), "Agency Costs, Net Worth, and Business Fluctuations", *The American Economic Review*, 79(1): 14-31.
- Bibow, J. (2008), "The international monetary (non-)order and the 'global capital flows paradox' ", in E. Hein, P. Spahn, T. Niechoj and A. Truger, (eds.), *Finance-led Capitalism?*, Marburg: Metropolis.

- Blanchard, O.J., Giavazzi, F. and Sa, F. (2005), “International investors, the U.S. current account and the dollar”, *Brookings Papers on Economic Activity*, 36.
- Blanchard, O.J., Summers, L. (2017), Rethinking Stabilization Policy: Evolution or Revolution?, NBER Working Paper No. 24179
- Blanchard, O.J. (2018), Public Debt and Low Interest Rates, Mimeo
- Bloch, M. (1954), “Esquisse d’une histoire monétaire de l’Europe”, L. Febvre and F. Braudel (eds.), *Cahiers des annales*, Paris: Armand Colin.
- Caballero, R. J., Fahri, E. and Gourinchas, P. O. (2008), “An equilibrium model of ‘Global Imbalances’ and low interest rates”, *American Economic Review*, 98(1): 358-393.
- Cipolla, C.M. (1982), *The Monetary Policy of Fourteenth-century Florence*, Berkeley: University of California Press. [English translation of Cipolla, C.M. (1982), *Il fiorino e il quattrino*, Bologna: il Mulino].
- Cooper, R. N. (2008), “Global Imbalances: Globalization, demography and sustainability”, *Journal of Economic Perspectives*, 22(3): 93-112.
- Dynamics and Control*, 59: 95-111.
- De Cecco, M. (2013), “Introduzione” in C.M. Cipolla, *Il fiorino e il quattrino*, new edition, Bologna: il Mulino.
- De Cecco, M. (2012), “Global Imbalances: Past, Present and Future”, *Contributions to Political Economy*, 31(1): 29-50.
- Di Filippo, G. (2011), *Essays in Exchange Rate Dynamics Modelling Through Lessons From Behavioural Finance*, Thesis for the grade of Doctor in Economics, supervised by H. Sterdyniak, reviewed by E. Girardin and H. Raymond-Feingold, Université Paris Dauphine.
- Dooley, M. and Garber, P., (2007), “Is it 1958 or 1968? Three notes on the longevity of the revived Bretton Woods system”, in R. Clarida, (ed.), *G-7 Current account imbalances: sustainability and adjustment*, Chicago: University of Chicago Press: 95-111.
- Dornbusch, R. (1976), “Expectations and Exchange Rate Dynamics”, *Journal of Political Economy*, 84(6): 1161-76.
- Fantacci, L. and Sanfilippo, E. (2019), “At the origin of the concept of ‘liquidity trap’: early discussions between Robertson and Keynes”, paper presented at the ESHET Annual Conference, Lille, 24 May 2019
- Feldstein, M. (1986), “The budget deficit and the dollar”, *NBER Macroeconomic Annual*, Cambridge, MA: MIT Press (September): 355-409.
- Fields, D. and Vernengo, M. (2013), “Hegemonic Currencies During the Crisis: the Dollar versus the Euro in a Cartalist Perspective”, *Review of International Political Economy*, 20(4): 740-759.

- Gali, J. (2014), “The effects of a money-financed fiscal stimulus”, CEPR Discussion Paper 10165
- Greenwald, B. and Stiglitz J.E. (1993), “New and Old Keynesians”, *Journal of Economic Perspectives*, 7(1): 23-44.
- Harvey, J.T. (1993), “Daily Exchange Rate Variance”, *Journal of Post Keynesian Economics*, 15(4): 515-40.
- Harvey, J.T. (2001), “Exchange Rate Theory and ‘The Fundamentals’”, *Journal of Post Keynesian Economics*, 24(1): 3-15
- Harvey, J.T. (2009), *Currencies, Capital Flows and Crises*, London and New York: Routledge.
- Hicks, J. R. (1937), “Mr. Keynes and the Classics”, *Econometrica*, 5(2): 147-159.
- Keynes, J.M. ([1936] 1973), “The General Theory of Employment, Interest, and Money” in *The Collected Writings of John Maynard Keynes. Volume VII*, ed. by E. Johnson and D. Moggridge, London: Macmillan.
- Keynes, J.M. ([1937] 1973), “The General Theory of Employment”, *Quarterly Journal of Economy*, 51(2): 209-223, in *The Collected Writings of John Maynard Keynes. Volume XIV*, ed. by E. Johnson and D. Moggridge, London: Macmillan.
- Keynes, J.M. ([1938] 1973), “J. M. Keynes to Roy Harrod, 10 July 1938” in *The Collected Writings of John Maynard Keynes. Volume XIV*, ed. by E. Johnson and D. Moggridge, London: Macmillan.
- Kregel, J. (2019), “Globalization, Nationalism, and Clearing Systems”, Levy Economics Institute, Public Policy Brief No. 147, March
- Krugman, P. (2002), “Exchange Rate”, in D. R. Henderson (ed.), *The Concise Encyclopedia of Economics*. Available online: <<http://www.econlib.org/library/Enc1/ExchangeRates.html>> (accessed April 2, 2016).
- Krugman, P. (2007), “Will there be a dollar crisis?”, *Economic Policy*, 51: 435-467.
- Krugman, P. (2009), “How Did Economists Get It So Wrong?”, *The New York Times Magazine*, September 2. Available online: <http://www.nytimes.com/2009/09/06/magazine/06Economic-t.html?_r=0> (accessed April 2, 2016).
- Krugman, P., Obstfeld, M. and Melitz, M.J. (2009), *International Economics: Global Edition*, 9th edition, London: Pearson.
- Lavoie, M. (2015), *Post-Keynesian Economics: New Foundations*, Edward Elgar.
- Lucas, R. (1987), *Models of Business Cycles*, Oxford: Blackwell.
- Lucarelli, S. and Lunghini, G. (2012), *The Resistible Rise of Mainstream Economics*, Bergamo: Sestante.

- Lunghini, G. (2009), “La Teoria generale e i keynesiani: un’eredità giacente”, *Economia Politica*, 2, (August): 225-240.
- Meese, R. and Rogoff, K. (1983), “Empirical Exchange Rate Models of the 1970s: Do They Fit Our of Sample”, *Journal of International Economics*, 14(1-2): 3-24.
- Modigliani, F. (1944), “Liquidity Preference and the Theory of Interest and Money”, *Econometrica*, 12(1): 45-88.
- Obsfeld, M. and Rogoff, K. (1996), *Foundations of International Macroeconomics*, MIT Press.
- Orléan, A. (2008), “Les marchés financiers sont-ils rationnels? ” in P. Askenazy and D. Cohen (eds.), *Vingt sept questions d'économie contemporaine*, Paris: Albin Michel: 63-85.
- Palley, T. (2014), “The theory of global imbalances: mainstream economics vs. structural Keynesianism”, paper presented at the XI International Colloquium held at the Rio Branco Institute of Itamaraty on May 6-7, 2014, *Global crisis and the need for paradigm change* Brazilian Foreign Ministry, (August). Available on line <www.thomaspalley.com>, (accessed April 2, 2016).
- Palley, T. (2012), “From Financial Crisis to Stagnation: The Destruction of Shared Prosperity and the Role of Economics”, Cambridge: Cambridge University Press.
- Papadimitriou, D., Hannsgen, G. and Zezza, G. (2006), “The Global Imbalances Continue? Policies for the U.S. Economy”, Levy Economic Institute, Strategic Analysis (November).
- Parboni, R. (1982), “Economia Monetaria Internazionale”, in G. Lunghini (ed.), *Dizionario di Economia Politica*, vol. 4, Torino: Bollati Boringhieri: 11-78.
- Polanyi, K. ([1944] 2001), *The Great Transformation*, Boston: Beacon Press.
- Romer, P. (2016) “Troubles with Macroeconomics”, forthcoming in *The American Economist*.
- Schulmeister, S. (1988), “Currency Speculation and Dollar Fluctuations”, *BNL Quarterly Review*, December: 343-365.
- Taylor, J.B. (1993), “Discretion versus Policy Rules in Practice”, *Carnegie Rochester Conference Series on Public Policy*, 39(1): 195-214.
- Variato A. M., 2004, *Investimenti, informazione, razionalità*, Milano: Giuffrè.
- Varoufakis, Y. (2011), *The Global Minotaur*, London and New York: Zed Books.
- Vernengo, M. (2012), “Bretton Woods”, in J.E. King (ed.), *The Elgar Companion to Post Keynesian Economics*, Cheltenham: Edward Elgar: 46-50.