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**DEFLATIONARY ADJUSTMENT PROCESSES AND THE EFFECTIVENESS OF
STRUCTURAL REFORMS
IN MONETARY UNIONS**

George D. Demopoulos and Nicholas A. Yannacopoulos

Πατησίων 76, 104 34 Αθήνα. Τηλ.: 210 8203303-5 / Fax: 210 8238249
76, Patission Street, Athens 104 34 Greece.
Tel.: (+30) 210 8203303-5 / Fax: (+30) 210 8238249
E-mail: econ@aueb.gr / www.aueb.gr

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George D. Demopoulos

Athens University of Economics and Business
European Chair Jean Monnet

Nicholas A. Yannacopoulos

University of Piraeus

Abstract

In a currency area, the only policy option available to a deficit country to regain the loss of its competitiveness is to deflate. This is going to be a painful process, especially in situations in which the Tobin-Fisher effect is dominant. Adjusting through deflation may destabilize (under certain conditions) the economy of the debtor country, while in cases in which stability is preserved, the economy is trapped in a deflationary equilibrium characterized by low output and employment. There are no policies, at the national level, able to help the economy of the debtor country out of this deflationary trap, if the surplus country insists on preserving its surpluses. In this case, the debtor is forced to reduce its spending, demand side policies are out of question, while supply policies are counterproductive. Deflation may also worsen the terms of trade of the debtor country, reducing further its welfare.

Keywords: Monetary unions, asymmetric adjustments, structural reforms

JEL Classification: E52, E61, F15, F36

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Corresponding author: G. D. Demopoulos, Professor of Economics, Emeritus and European Chair Jean Monnet, Athens University of Economics and Business, 76 Patission Str., 104 34 Athens, Greece. Phone: +30-210 82 03 281, Fax: +30-210 82 03 301, Email: Demopoulos@aueb.gr

1. Introduction

Keynes, writing about seventy years ago, rejected the view that there is an automatic adjustment mechanism that preserves equilibrium in fixed exchange rate regimes. To “suppose”, he remarked, “that there exists some smoothly functioning automatic mechanism which preserves equilibrium if only we trust to methods of *laissez-faire* is a doctrinaire delusion which disregards the lessons of historical experience without having behind it the support of a sound theory” (1980, p.21-22). In reality, he argued, the process of adjustment is compulsory only for the debtor and optional for the creditor. And if the creditor country prefers to hoard its surpluses (as it is usually happens), then the burden of adjustment is thrown on the shoulders of the debtor who, in order to regain its lost competitiveness, has no other option but to deflate (*asymmetric adjustment*). Deflation (internal devaluation) is expected to stimulate exports by reducing their international price in terms of imports, provided that the other countries do not follow suit.

However, deflation may have some undesirable effects for the domestic economy of the debtor country: it may reduce, under certain conditions, domestic output and employment. Eggertsson *et.al.* (2013) note that, in a crisis that pushes the nominal interest rate to its lower bound, deflation may turn the aggregate demand curve backward sloping, implying that lower prices are associated with lower output¹. This is due to the fact that deflation increases *cet. par.* the real interest rate with negative effects on output and employment. And since the nominal interest rate has reached a zero level, the central bank is no longer able to offset these undesirable outcomes by reducing the nominal interest rate. In such an environment, supply side policies through structural reforms become counterproductive, at least in the short run. Eggertsson *et. al.* (2013) argue that, even in a zero lower bound (ZLB) environment, structural reforms may be expansionary. This argument presupposes that reforms, if credible, create a wealth effect that increases permanent income that stimulates both present and future consumption.

Similar views are expressed by a number of other economists. Fernandez-Villaverde *et.al.*(2011) argue that future increases in productivity or reduction in mark-ups, triggered by supply side policies, generate a wealth effect that pull current

consumption and output up. And since the economy is at the ZLB, the interest rate cannot undo the wealth effect, as it will have done outside the ZLB. Benoit Coeure (2014) emphasizes that a one- off price adjustment, insofar as it boosts future income, it may raise inflationary expectations and lower real rates of interest. However, if the price adjustment is gradual, it creates deflationary expectations that lead to increases in the real interest rates.

We argue in this paper that there is no need to assume a ZLB, to obtain a positively sloped aggregate demand curve for the following reasons: If we assume, as Fisher (1933) did, that deflation redistributes real income from debtors to creditors, and that the marginal propensity to consume of the debtors is higher than that of the creditors (Tobin, 1975; 1980), then this redistribution of income leads to a decline in aggregate spending and consequently to a decline in aggregate demand, leading to a backward sloping aggregate demand curve (Tobin, 1980, Figure 7). This is the *Tobin-Fisher effect*. In this case, supply side policies (structural reforms) are counterproductive, as in Eggertsson's (2010) model. However, in contrast to Eggertsson *et. al* (2013), we argue that the long run favourable effects of the supply side policies are questionable because deflation renders debtors liquidity constrained, and therefore unable to optimize their intertemporal consumption function. Thus, in a world in which the Tobin-Fisher effect dominates, improving competitiveness through domestic deflation is likely to be a painful process, due to resulting recession and the ensuing unemployment². Furthermore, deflation, though it may improve conditions of the balance of trade, is likely to worsen the *terms of trade*, reducing further the welfare of the deficit country.

The rest of this paper is organized as follows: In the next Section, we discuss the asymmetric adjustment process in a non-optimal currency area, and argue that, in this case, the burden of adjustment in the currency area is transferred to the debtor, who has no other option but to deflate. In Section 3, we discuss the effects of deflation on the domestic economy of the debtor country, and the conditions under which a stable equilibrium may be reached. In Section 4, we investigate the policy implications (i.e., whether there are means open to the authorities, at the national level, for countering unemployment and improving output). In Section 5, we analyze the effects of deflation on the terms of trade of the debtor, while in the final Section we conclude.

2. Asymmetric adjustments in non-optimal currency areas

In a non-optimal and not fiscally integrated currency area, factor mobility is too limited to serve as an asymmetric shock absorber, and there are no fiscal mechanisms to transfer resources across regions in the event of such a shock. Therefore, if the currency area is subjected to an asymmetric shock, real exchange rates have to adjust if payments imbalances are to be removed. Classical economists argued that in a decentralized economic system, i.e. in a system in which each country's objective is to maximize its own utility, without considering the effects of its policy on the others, imbalances that may appear are corrected, in a *laisser-faire* environment, through monetary flows that automatically bring adjustments in relative prices between the creditor and the debtor countries. In fact, since in a currency area the money supply is endogenous, the common currency flows from countries experiencing a balance of payment deficit to those experiencing a balance of payments surplus. If we assume that the quantity theory of money holds, then relative prices increase in the country experiencing a balance of payments surplus, and decrease in the countries experiencing a balance of payments deficit. Thus, imbalances in the currency are removed and the competitive gap between creditors and debtors ceases to exist.

This approach is usually criticized for its dependence on the quantity theory of money and its assumptions of wage and price flexibility. However, its main defect lies on its postulate that both creditors and debtors are willing to adjust (*symmetric adjustment*). In reality, the behaviour of the countries in a fixed exchange rate regime, and *a fortiori* in a currency area, may be *asymmetric* rather than symmetric, because the process of adjustment is compulsory only for the debtor and optional for the creditor (Keynes, 1980). But, if the process of adjustment is optional for the creditor, its preferences cannot be ignored. In a world in which adjustment works via changes in relative prices, if the creditor prefers to adjust, then the internal devaluation of the debtor, is offset by the internal revaluation of the creditor. In this case, the final outcome is no different from that predicted by the *laisser-faire* approach (at least in principle). Imbalances are removed and total demand remains unaffected. But if the creditor country prefers to hoard its surpluses, then the situation is completely different.

Macroeconomic *imbalances* remain, indicating the accumulation of balance of payments surpluses on the part of the creditors and the deterioration of the external position of the debtor, which is associated with sizeable competitiveness losses. And since the creditor prefers to hoard its surpluses, the burden of adjustment is thrown on the shoulders of the debtor who, in order to regain its lost competitiveness, has no other option but to deflate (without the compensating wage and price increases (*internal revaluation*) by the debtor). The conventional argument is that deflation triggers a real devaluation, contributing to a reduction in the competitive gap between the creditor and the debtor country, provided that the creditor does not follow suit. However, deflation may have some undesirable effects for the debtor country (decline in aggregate demand, increase in unemployment), and may worsen its *terms of trade*, reducing further its welfare. The effects of deflation on the debtor country are discussed in the next two sections.

3. Effects of deflation on the domestic economy of the debtor

In order to evaluate the effects of deflation (*internal devaluation*) on the domestic economy of the deficit country, we need to know the forms of the demand and supply functions, how they interact and whether the equilibrium derived from this interaction is stable or unstable.

3.1. Aggregate demand. In general, aggregate demand has the form:

$$y = \varphi(p) \quad (1)$$

We graph the aggregate demand curve with the real income y on the horizontal axis and the price p on the vertical. In particular, y is the sum of consumption c and the investment I ; the first being a function of the current income and the second a function of the nominal rate of interest and the marginal efficiency of capital. The form of the aggregate demand curve is explained with the help of the following two propositions:

Proposition 1. *The derivative dy/dp of (1) has a negative sign if the Keynes and Pigou effects are dominant.*

In the context of the conventional Keynesian model we are using, the effects of falling prices on domestic output and employment are implemented via two channels. The first is the *Keynes effect*: A decline in the level of prices increases real money supply. This leads to a decline in the interest rate (given the liquidity preference) and to an increase in investment with positive effects on output and employment (via the multiplier). The Keynes effect is expected to vanish in the case of a liquidity trap, and in the case in which investment spending is completely inelastic to changes in the interest rate. The second is the *Pigou effect* (the real balance effect). The lower the price level leads to a higher value of wealth, which is expected to stimulate consumers demand. Thus, when the Pigou and the Keynes effects are dominant, the aggregate demand curve has its *normal* negative slope, implying that deflation (internal devaluation) improves output and employment within the domestic economy.

However, the positive effects of declining prices are offset by what we may call a *Tobin-Fisher effect*. In fact, as Fisher (1933) has remarked, an unanticipated deflation *redistributes* income from debtors to creditors making the creditors better off and the debtors worse off. In fact, contracts are usually set in nominal terms. Therefore, debtors see that the real value of their debts increase, implying that creditors receive more payment in real terms. If we assume that creditors have a lower propensity to consume than debtors (Tobin, 1980), then this *redistribution* of wealth reduces aggregate demand because creditors spend a lower fraction of their additional income, while debtors are forced to cut back consumption and investment in order to reduce (or repay) their debts. Furthermore, debtors tend to become *liquidity constrained*, and, therefore, unable to borrow in order to increase their spending either as consumers or/and as investors. In fact, as their debt/ equity ratio increases with deflation, their credit lines tend to shrink or, in case of bankruptcies, disappear (Tobin, 1975; 1980).

Thus, falling prices are associated with a decline in spending and therefore output. This means that the sign of the derivative dy/dp changes from negative to positive,

implying that the aggregate demand curve becomes *backward bending*. This is summarized in the following proposition:

Proposition 2. *The derivative dy/dp of (1) has a positive sign when the Tobin-Fisher effect dominates.*

This phenomenon can also be explained with the help of the conventional IS-LM model. In this model, falling prices shift both the LM curves and the IS curves to the right, because of the Keynes and Pigou effects respectively, while the Tobin-Fisher effect shifts the IS curve to the left. Whether the output increases or declines depends on the relative strength of these two effects. The resulting aggregate demand curve has a negative slope, *so long as* the Keynes and Pigou effects dominate, but it bends *backwards* indicating that, despite the falling prices, output declines *when* the Fisher-Tobin effect becomes dominant (as in Figure 1; see also Tobin, 1980, Figure 7, p. 17). The kink of the aggregate demand curve occurs at the inflation rate at which the Pigou effect *ceases* to be dominant and is *overtaken* by the Tobin- Fisher effect, i.e., at the critical rate of inflation, at which the derivative dy/dp changes sign from negative to positive.

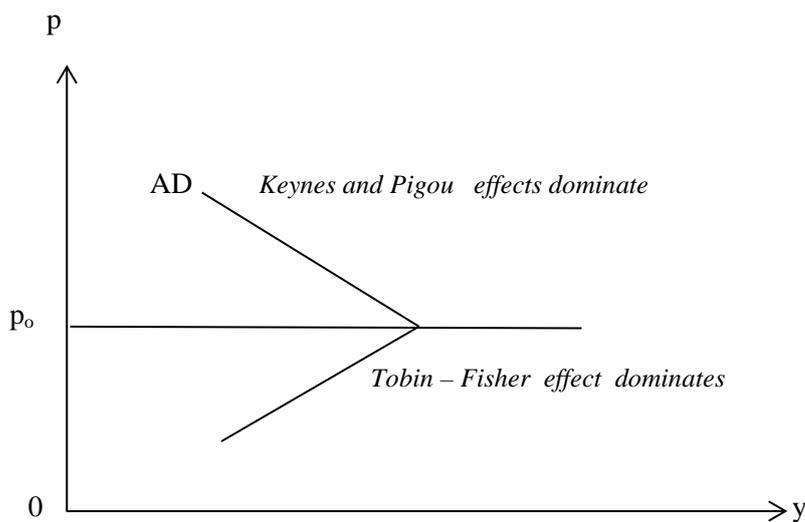


Figure 1

3.2. Aggregate supply. The aggregate supply curve describes the relationship between the supply of output and the price level. It can be written as:

$$y_s = f(w/p, K) \quad (2)$$

with the properties $\frac{\partial y}{\partial (\frac{w}{p})} < 0$ and $\frac{\partial y}{\partial k} > 0$, where y_s denotes the output supplied, w/p the real wage and K the amount of capital. In what follows, we assume that capital is fixed. The form of the aggregate supply curve depends on our assumptions about the behaviour of the labour market. We may distinguish between three cases:

(i) Nominal wage is fully flexible and adjusts so as to keep the demand of labour equal to its supply (classical approach). In this case the wage equation, which describes the equilibrium in the labour market, is:

$$w = pw^*$$

where w^* is the nominal wage that clears the labour market. If the price p increases, nominal wages w increase in the same proportion so as to satisfy the above equation. The real wage does not change and therefore the output supplied remains unaffected.

(ii) Nominal wages are fixed (Keynesian case). Nominal wages are determined by bargaining between trade unions and employers, and remain constant for the period for which the contract is signed. The equilibrium in the labour market is written as:

$$w = w^*$$

where w^* denotes the nominal wage determined by the bargaining process that remains constant for the period for which the contract is signed. In this case, an increase in the price level p , given the nominal wage w , reduces the real wage and expands output (in accordance with condition (1)). The aggregate supply curve is presented, in the y - p space, as a straight line having a slope: $0 < dp/dy < \infty$.

(iii) Finally, we may assume that prices and nominal wages are fixed as in the extreme Keynesian case. The aggregate supply curve is then a horizontal line in the y - p space.

3.3. Deflationary equilibrium and its stability. Domestic equilibrium is obtained at the point at which the aggregate demand and the aggregate supply schedules intersect. Since we are interested in a world in which the Tobin-Fisher effect is dominant, the aggregate supply curve crosses the aggregate demand curve at its positively sloped section. This intersection point termed the Tobin-Fisher point of equilibrium. The fact that at the Tobin-Fisher equilibrium point, both the aggregate demand and aggregate supply curves have positive slopes, *raises the question* of whether this equilibrium is stable, i.e., whether the forces that act on the system are able to restore equilibrium following a shock. In cases, in which one of the two functions is “abnormal” (in our case the aggregate demand curve), while the other is “normal” (in our case the aggregate supply curve), the *static stability* of equilibrium depends on the *assumptions* we make about the behaviour of the relevant variables, when they are out of equilibrium (Gandolfo, 1997). We may, therefore, distinguish between two behavioural assumptions:

(i) *The system adjusts via changes in quantities* (Marshallian behaviour assumption; Marshall, 1956, p. 288). Consider the case, in which at a given quantity, the demand price exceeds the supply price. Then, the system is *stable* if an increase in the quantity equalizes demand price with supply price, and *vice versa*. If at a given quantity, the supply price is higher than the demand price, then a decrease in the quantity equalizes the demand price with the supply price. More formally (Gandolfo, 1997):

$$\frac{de}{dy} = \frac{dp}{dy} - \frac{dp^*}{dy} < 0$$

where p is the demand price and p^* the supply price. In geometrical terms this means that the equilibrium is stable, when, at the Tobin-Fisher equilibrium point, the aggregate supply curve is *steeper* than the aggregate demand curve.

(ii) *The system adjusts via changes in prices* (Walrasian behaviour assumption). Assume that at a given price there is an excess demand. Then the system is stable if an increase in price eliminates the excess demand, and *vice-versa*. If at a given price there is an excess supply, a decline in price eliminates the excess supply. Or, more formally (Gandolfo, 1997):

$$\frac{dE}{dp} = \frac{dD}{dp} - \frac{dS}{dp} < 0$$

where D denotes demand, S supply and p the price.

Geometrically, the system is *stable* in the *Walrasian sense* if, at the Tobin-Fisher equilibrium point, the aggregate demand curve is steeper than the aggregate supply curve, and *stable* in the *Marshallian sense* if, at the Tobin-Fisher equilibrium point, the aggregate supply curve is steeper than the aggregate demand curve. *In what follows, we shall assume that the system adjusts via changes in prices, and therefore its stability is defined in the Walrasian sense as in (ii) above.* From this assumption we derive two important results:

(a) The Tobin-Fisher equilibrium point is always *unstable*, if the labour market is fully flexible (as in the classical case), i.e., when the aggregate supply curve is vertical on the output axis in the y-p space (as in Figure 2). However, equilibrium is *stable*, when the Keynes and Pigou effects dominate. Therefore, when the labour market is fully flexible, the system cannot absorb disturbances caused by deflation, and changes its basic behaviour it turns from stable into an unstable one.

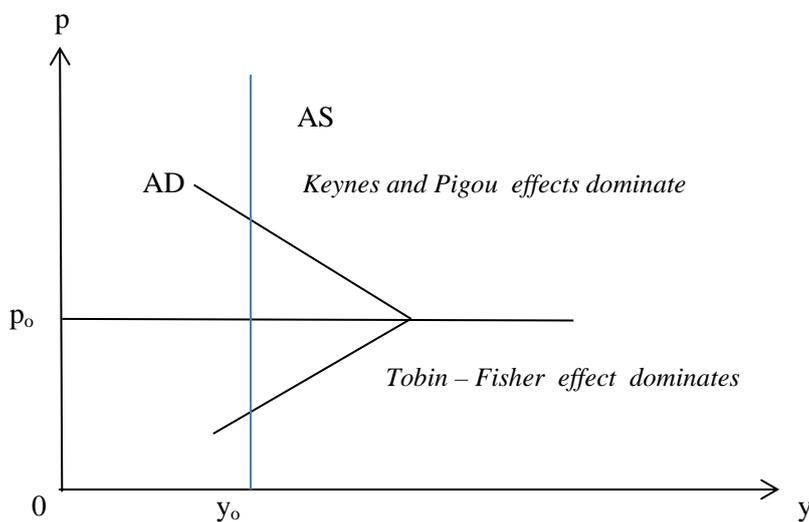


Figure 2

(b) The Tobin-Fisher equilibrium point is always *stable*, if prices and wages are sticky. That is when the aggregate supply curve is an horizontal straight line, parallel to

the output axis in the y - p space, as in the extreme Keynesian case. This is depicted in Figure 3.

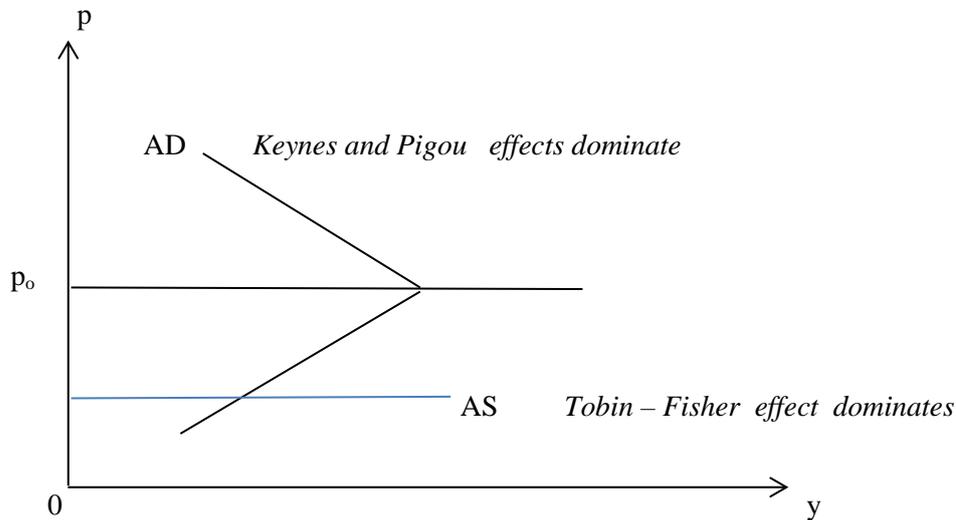


Figure 3

These two results offer a different interpretation of the *paradox of flexibility*, introduced by Eggertsson and Krugman (2012). However, one has to emphasize that this “paradox” depends on the assumption that the Tobin-Fisher equilibrium is stable in the Walrasian sense. If we assume that the system adjusts through changes in quantities (Marshallian behaviour assumption) then, the Tobin-Fisher equilibrium point is always stable when the nominal wages are fully flexible (the aggregate supply curve is vertical on the horizontal axis in the y - p space) and unstable when wages and prices are fixed, as in the extreme Keynesian case.

Thus, when the Tobin-Fisher effect dominates, the economy of the debtor is trapped in a deflationary equilibrium, i.e., at an equilibrium point lying on the positively sloped part of the aggregate demand curve. This equilibrium may be stable or unstable depending on the slope of the aggregate supply curve, as we have already explained. However, even in the case in which the deflationary equilibrium is stable in the economic (Walrasian) sense, it is unstable in a social sense since such an equilibrium is associated with prevailing political disturbances, labour struggles, etc, unavoidable with restrictive austerity policies of such severity as would be required for this purpose. The question then, is whether there are policies available at the national level, and

within the context of the monetary union, that could improve output and employment. We look at this issue in the next section.

4. Supply side and demand side policies

4.1. Supply side policies. Consider now the effects of *structural reforms* under the assumptions that the Tobin-Fisher effect dominates, and that the economy is in a stable equilibrium in the Walrasian sense. Structural reforms, that increase productivity or reduce mark-ups, shift the aggregate supply curve down to AS' , as shown in Figure 4; see also, Eggertsson et al. (2013). Given the price level p_0 , the output tends to increase (more output is produced at a given price). This means that reforms create an excess supply equal to ab , that leads to a fall in prices (in accordance with the Walrasian behaviour assumption). The new equilibrium point is at c , at which corresponds a lower output and a lower price. Therefore, reforms are contractionary. The intuitive explanation is: reforms that lead to a decline in prices, amplify the negative effects of deflation and have contractionary results. The Tobin-Fisher effect is more pronounced. This conclusion is similar to the Eggertsson's toil paradox (Eggertsson, 2010).

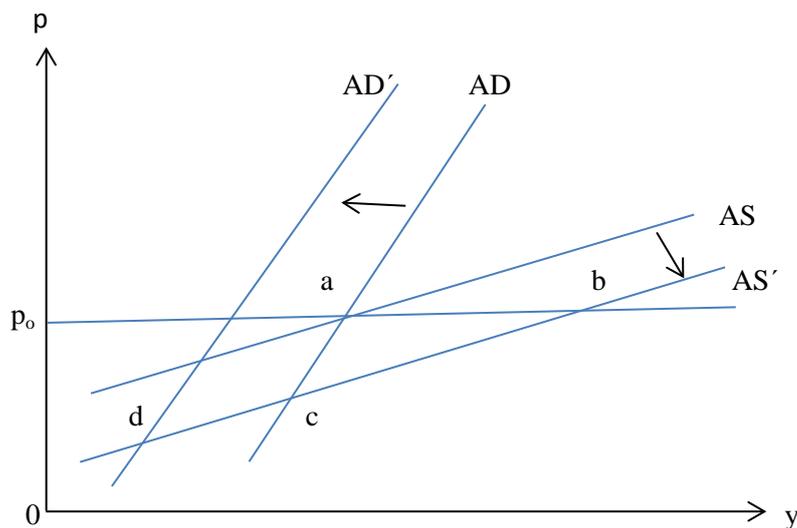


Figure 4

The question then is whether these negative effects of the supply side policies may be offset by demand side policies that shift the aggregate demand curve. New-Keynesian economists argued that reforms (if they are credible) create a wealth effect that increases permanent income that stimulates present and future consumption. This view presupposes that consumers are *not liquidity constrained* and, therefore, they are able to optimize their inter-temporal consumption function, subject to their inter-temporal budget constraint. However, as we have argued in section 3.1, in cases in which the Tobin-Fisher effect is dominant, debtors are liquidity constrained. Liquidity constrained consumers have a high propensity to consume out of their current disposable income. Thus, the Keynesian consumption function,

$$c = f(y)$$

with the properties $0 < f' < 1$, $f'' < 0$, where f' is the marginal propensity to consume, is more appropriate in situations in which the Tobin-Fisher effect is dominant rather than the inter-temporal consumption function. Therefore, when income declines, due to the contractionary effects of structural reforms, so does private consumption that depends on the current disposable income.

Apart from the falling consumption, falling prices may have adverse effects on the marginal efficiency of capital, by reducing the prospective yields of investment. Therefore, investment may decline. Keynes (1936, p. 264) offered a second reason for the adverse effects of falling prices on investment: “If the fall of wages and prices”, he wrote, “goes far, the embarrassment of those entrepreneurs who are heavily indebted may soon reach the point of insolvency, - with severely adverse effects on investment. Moreover, the effect of the lower price-level on the real burden of the national debt and hence on taxation is likely to prove very adverse to business confidence”. The decline in consumption and investment reduces aggregate demand, with negative effects on output and employment. The aggregate demand curve shifts to the left, as shown in Figure 4. The new equilibrium point is now at d. Both output and prices decline.

4.2. Demand side policies. We have concluded, in the previous section, that supply side policies are counterproductive. The question then is whether demand side policies are

more effective. Since by definition monetary policies in a currency area are not at hand for individual members, aggregate demand may be stimulated by expansionary fiscal policies, provided, of course, that these policies are not restricted by fiscal austerity measures (as in few of the Euro zone countries today). Fiscal austerity measures, associated with internal devaluation, may be costly, especially when interest rates are at the zero level. In this case, fiscal multipliers are large, and therefore spending reductions result in a decline in output. Moreover, if the surplus countries insist on hoarding their surpluses (as it usually happens), then the deficit countries, *as a group*, remain under a continuous pressure to restrict their demand, by adopting deflationary policies. And since these policies are not offset by expansionary policies by the surplus countries, the net result is a general deflation for the currency area as a whole. *In this context, a monetary union is a deflationary biased system, implying that demand side policies are restricted by the system itself.*

The only way out of this impasse may be provided by the monetary authorities of the currency area. As O'Rourke (2014, pp. 15-16) emphasized (referring to the Eurozone), the Central Bank of the currency area has to act aggressively, not just to prevent deflation, but to increase inflation for a transitional period, to facilitate real exchange rate adjustment, and promote the solvency of the member states.

5. Balance of payments and the terms of trade

Deflation is part of the relative price adjustment mechanism, provided that the rate of inflation in the creditor country is higher than that of the debtor. The question then is whether deflation, by improving trade competitiveness, may dampen the negative effects of falling prices on domestic output and employment. Keynes (1929, 1936, 1980) argued that although deflation may improve the balance of trade of the debtor country, it may worsen its terms of trade. In this case, there will be a further reduction in real incomes, with a possible exception of the newly employed in the exports sector. Thus, it is not certain that improving the balance of trade, the negative effects of deflationary adjustment will be offset.

However, there is another issue that needs consideration in this context. Heavily indebted members of the currency area have to transfer large amounts of money to their

creditors, to repay their debts. This rebalancing problem can and should be considered from the vantage point of the *transfer problem* initiated by Keynes (1929) and Ohlin (1929), in the context of the German reparation payments after the First World War (Corsetti, *et.al.*, 2013). The debtor, in order to transfer money to the creditor, has to run a balance of payment surplus, i.e., to make its exports cheaper relative to its imports. If the debtor has a higher propensity to spend on its export good than the creditor, this transfer worsens the terms of the trade of the debtor, adding an excess burden to the direct burden of the payment.

6. Concluding remarks

Improving competitiveness via deflation in a currency area, is likely to be a painful process because deflation increases the burden of the debt and strengthens the Tobin-Fisher effect that leads to a backward sloping aggregate demand curve. Given the backward sloping aggregate demand curve, falling prices may destabilize the economic system under certain conditions, while, in the cases in which stability is preserved, the economy may be trapped at a *deflationary equilibrium point* (the Tobin-Fisher equilibrium point lying on the positively sloped part of the aggregate demand curve), characterized by a declining output and employment.

In such an environment, the prospects for economic recovery are likely to be weak or, even, nonexistent. In fact, there are no policies available, at the national level, for countering unemployment and improving output. If the creditor country insists on preserving surpluses in its balance of payments, then the debtor has no other choice but to restrict its spending; thus, policies that stimulate aggregate demand are excluded.

On the other hand, supply side policies (in the form of structural reforms) are *counterproductive*, because they amplify the negative effects of deflation, and reduce further employment and output. Thus, adjustment via deflation may lead the member of the currency area into an impasse. In these cases, the Central Bank of the currency area has to act aggressively, not just to prevent deflation, but to increase inflation for a transitional period, to facilitate real exchange rate adjustment, and promote the solvency of the member states.

This situation towards a general deflation combined with unemployment in many countries, characterized the world economy in the *interwar period*, especially during the thirties, and led to disastrous economic and political consequences. Asymmetric adjustment (and the deflationary bias associated with it) has been the inherent characteristic of any fixed exchange rate regime. Economists, like Cassel (1932), and Keynes were aware of the deflationary bias of the gold standard which was a fixed exchange rate regime.

Cassel argued that the crisis of the world's monetary system *in the thirties* was due to the fact that the then surplus countries (USA and France) did not abide by the rules of the gold standard game and refused to increase their domestic money supply despite the inflow of gold. The gold losing countries in order to defend their gold reserves had to adopt deflationary policies. The result was a severe pressure on the domestic prices of the gold losing countries, increased competition in the world markets, and in consequence a world-wide deflation. He considered that the fall of the general price level in the thirties was a monetary phenomenon, and argued that measures should be designed to restore commodity prices to pre-depression levels.

In a similar vein, Keynes (1980) argued that the reasons for which freely international metallic standards (and we may add any fixed exchange rate regime) failed to preserve equilibrium was their deflationary bias: the process of adjustment was compulsory for the debtor and optional for the creditor. But only Keynes drew his lessons from the problems of this period. His 1941 plan for a Clearing Union (Keynes, 1980) was designed to retain the advantages of the fixed exchange rate regime, while avoiding the costs of asymmetric adjustment process. After eighty, or so, years, politicians seem to have forgotten the lessons from the Great Depression. In the Eurozone, we see similar phenomena to unfold. Surplus countries refuse to adjust, imposing deflation and unemployment in the rest of the system.

Notes

1. On the backward sloping aggregate demand curve in the context of the New – Keynesian model, see, among others, Eggertsson, (2009; 2010; 2012), Eggertsson and

Krugman (2012), Eggertsson, Ferrero, and Raffo (2013). For an earlier discussion on this, see, Tobin (1980).

2. This fact was emphasized by De Grauwe (2011), although in a different context.

References

Cassel, G.(1932). *The Crisis in the World's Monetary System*.Oxford: The Clarendon Press.

Coeure, B.(2014). Structural reforms: learning the right lesson from the crisis. Keynote speech by B. Coeure, Member of the Executive Board of ECB. Economic Conference, Latvijas Banka, Riga, 17, Oct.

Corsetti, G., Martin P., & Pesenti, P.(2013). Current- account rebalancing and international transfers (Immaculate or not). *Vox EU*, 31 January.

De Grauwe, P. (2011). The governance of a fragile Eurozone. CEPS Working Documents, No.346, May.

Eggertsson, G. (2009). What fiscal policy is effective at zero interest rates? *Federal Reserve Bank of New York, Staff Reports*, No 402, November.

Eggertsson, G. (2010). The paradox of toil. *Federal Reserve Bank of New York, Staff Reports*, No 433.

Eggertsson, G. (2012). Was the new deal deflationary? *American Economic Review*, 102(1), 524-555.

Eggertsson G., & Krugman P. (2012). Debt, deleveraging, and liquidity trap: A Fisher-Minsky-Koo approach. *Quarterly Journal of Economics* 127(3), 1469-1513.

Eggertsson, G., Ferrero A., & Raffo A. (2013). Can structural reforms help Europe?, *Board of the Governors of the Federal Reserve System, International Finance Discussion Paper* No 1092, November.

Fernandez- Villaverde, J., Guerron –Quintana, P., & Ramirez, J. (2011). Supply side policies at the zero level bound. *Research Department, Reserve Bank of Philadelphia*, Working Paper No. 11-47, Oct. 26.

Fisher, I. (1933). The debt deflation theory of great depression. *Econometrica*, 1(4), 337-357.

Gandolfo, G. (1997). *Economic Dynamics*. Berlin: Springer.

Keynes, J.M. (1929). The German transfer problem. *Economic Journal*, 39, 1-7.

Keynes, J.M. (1936). *The General Theory of Employment, Interest and Money*, London: Macmillan and Co Ltd.

Keynes, J.M.(1980). *Activities 1940-44; Shaping the Post War World: The Clearing Union*. The Collected Writings of John Maynard Keynes, Vol. XXV (ed. by Donald Moggridge), Macmillan, Cambridge University Press, for the Royal Economic Society.

Marshall, A. (1956). *Principles of Economics*, 8th edition. London: Macmillan (First Edition 1890).

Ohlin, B. (1929) The German transfer problem: A discussion. *Economic Journal* 39, 172- 182.

O' Rourke, K. (2014). Whither the euro?, *Finance and Development*, Quarterly, Vol.51, No. 1, March.

Tobin, J. (1975). Keynesian models of recession and depression. *Cowles Foundation Paper* 428. Reprinted from *American Economic Review*, 75, 1975.

Tobin, J. (1980). *Asset Accumulation and Economic Activity*. Yrjo Jahnsson Lectures, Oxford: Basil Backwell.