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**THE TRANSFER PROBLEM, DOMESTIC DEFLATION AND
UNEMPLOYMENT IN CURRENCY AREAS**

by

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Abstract

The transfer problem is concerned with the question of whether the financial transfer (the amount of money paid from the debtor to the creditor) generates an equal trade surplus in the debtor country, rendering the transfer in real terms possible. We argue in this paper, that in a currency area, like the Eurozone, in which the creditors insist on keeping their surpluses, the financial transfer fails to generate a corresponding trade surplus in the debtor country. The transfer is always underaffected. The debtor, in order to produce the required trade surplus, has to deflate. Domestic deflation (internal devaluation) has two consequences for the debtor country. First, it may have an adverse effect on its terms of trade and, second, by intensifying the Tobin-Fisher effect, it may reduce its domestic output and employment.

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1. Introduction¹

Heavily indebted members of the Eurozone have to transfer huge amounts of the common currency for years, if not for decades, to their creditors, in order to repay their debts (De Grauwe, 2013). The question is, whether this transfer will deteriorate *the terms of trade* of the debtor country, adding an additional burden to the *direct burden* of the transfer. Keynes (1929), in his discussion with Ohlin (1929), about the German reparations under the Treaty of Versailles (mostly never paid), argued that the debtor (in his days, Germany), in order to pay its money to the creditor, has to run an *export surplus*. In a fixed exchange rate regime, exports may be stimulated by domestic deflation (internal devaluation) or through increasing efficiency. Domestic deflation may lead to a deterioration of the terms of trade of the debtor country, adding an *additional* burden to the direct burden of the payment.

Ohlin, on the other hand, insisted that the *financial* transfer need not affect the terms of trade: If the debtor raises taxes to repay the creditor, his income declines and, with it, his imports. Conversely, the creditor country benefits from the rise of its income (after the transfer), that leads to an increase in its imports. And since the imports of the creditor are the exports of the debtor, the transfer may restore equilibrium in both countries, without affecting the terms of trade. In the 1929 debate, Keynes argued as a “classical” economist (he upheld the “classical presumption”), while Ohlin as a “Keynesian”.

We argue, in this paper, that *Ohlin’s view may be applicable* in a currency area, in which all member countries are willing to adjust. In fact, international transfer restores equilibrium, if the creditor country is willing to accept payments of its claims in the form of a surplus import of goods and services (i.e., by running a deficit in its trade account), equal to the amount of the financial transfer. However, in a currency area (like the Eurozone), in which the creditors insist on running an export surplus, the “automatic” adjustment mechanism, implied by the Ohlin’s argument, is blocked from the side of the creditors. In this case, the transfer is always *undereffected*, which means that the trade surplus of the debtor is less than the financial transfer, leaving the debtor with a deficit in his current account. In order to restore the equilibrium in his current account (or in order to bridge the gap between the financial transfer and the real transfer), the debtor has to deflate. Deflation may have two undesirable effects for the debtor’s economy:

(i) *It may worsen its terms of trade.* In fact, the amount of price reduction required to stimulate the debtor's exports relative to its imports, depends on the elasticity of demand of the debtor's exports. If the demand of exports is less than unity, then a given reduction of export prices will produce a less than a proportionate increase in the quantity of imports. In this case, the gap between the real transfer and the financial transfer will remain, and a sale of assets or a new loan will be required to service the country's debt.

(ii) *It may reduce domestic output and employment*². Domestic deflation increases the burden of the debt and hence of taxation, and this may have adverse effects on output and employment of the debtor country. Furthermore, falling prices may change, under certain conditions, the slope of the aggregate demand curve from negative to positive, a fact that makes supply side policies (structural reforms) counterproductive and, therefore, unable, to unlock the required domestic productive capacity required for the transfer.

These two undesirable effects may add an *additional burden* to the *primary burden* of the payment, as Keynes (1929) had predicted (Nelson, 2015).

We are studying in this paper, the transfer problem, domestic deflation and unemployment in a currency area, as follows: In the next section, we outline the transfer problem for a small open economy, member of a currency area; in the third section, we discuss the additional burden from the transfer, associated with the reduction of output and rising unemployment; in the final section, we conclude.

2. The transfer problem and the terms of trade

The transfer problem is concerned with the question of whether the *financial transfer* (the amount of money paid from the debtor to the creditor) will produce an equal trade surplus in the debtor country, thereby making the transfer in *real* terms possible. The standard theory is as follows (Mundell, 1968, Chapter 2; Gandolfo, 1986, Book 2, pp.336-343): Assume that the debtor transfers the amount T to the creditor. This transfer reduces the disposable income of the debtor by T , and increases the disposable income of the creditor by the same amount. Therefore, the imports of the debtor decrease by the amount of mT , and those of the creditor increase by the amount m^*T , where m and m^* , are the marginal propensities to import of the debtor and the creditor, respectively. Hence, we have three effects on the debtor's balance of

payments: An initial deterioration by the amount T , an improvement due to lower imports by the amount mT , and finally, an improvement, due to higher exports by the amount m^*T (since the imports of the creditor are the exports of the debtor).

The sum of these three effects gives the overall change in the current account of the debtor:

$$B = mT + m^*T - T = (m + m^* - 1)T \quad (1)$$

Where, B denotes the current account of the debtor, and $mT + m^*T$ is the improvement in the trade balance of the debtor. The net effect is:

$$dB/dT = m + m^* - 1 \quad (2)$$

Thus, the current account of the debtor *improves*, if the sum of the marginal propensities to import exceeds unity, and *deteriorates*, if falls short of unity. And, it is in equilibrium, if the sum of the marginal propensities to import equals to unity. In the following, we consider the last two cases, since they are more relevant for the problem at hand.

2.1. The effected transfer case. If the condition $m + m^* = 1$ holds (this was Ohlin's tacit assumption), the transfer of the amount T triggers an automatic adjustment mechanism that restores equilibrium in the current account of both countries (the creditor and the debtor), i.e.:

$$mT + m^*T - T = T - (mT + m^*T) = 0 \quad (3)$$

where $T - (mT + m^*T)$ is the current account of the creditor. It follows from (3), that the amount of the surplus of the trade balance of the debtor is precisely the same as the amount of the deficit of the trade balance of the creditor. Therefore, the adjustment in the currency area, following the transfer, is *symmetric*. In this case, the transfer is *effected*: the financial transfer T is equal to the surplus of the trade balance of the debtor, making the transfer, in real terms, possible. The burden of the debt is limited to the primary burden of the transfer. In this case, *there is no transfer problem*, because markets fully and automatically accommodate the transfer, and there is no need for the terms of trade to change.

This argument is explained with the help of Figure 1 (Niehans, 1984, p. 47). On the horizontal axis of this figure, we measure the exports of the debtor country and on the

vertical the international terms of trade. The curve labeled D , describes the creditor's demand for the debtor's exports, and the curve labeled S , the supply of the debtor's exports, both depending on the terms of trade, before the transfer. A financial transfer equal to AB (from the debtor to the creditor) shifts both the S and the D curves to the right. The new curves are labeled S' and D' , respectively. If the Ohlin's assumptions hold (that is, if $m+m^*=1$), then the new equilibrium occurs at the point B , at which the curves D' and S' cross at the given terms of trade. In this case, the financial transfer AB is equal to the real transfer (the improvement in the trade balance of the debtor). The world economy is in equilibrium, and there is no need for the terms of trade to change.

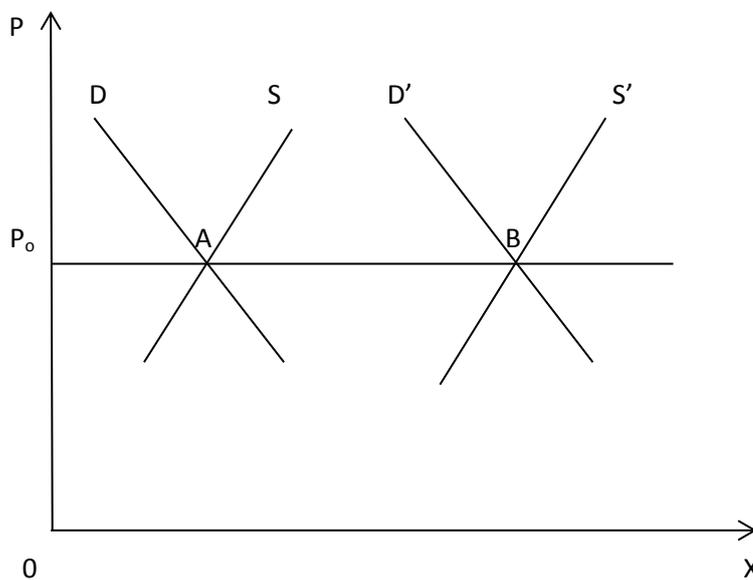


Figure 1
Effected transfer

2.2. The undereffected transfer. Keynes did not ignore the case of the effected transfer. “If 1 pound is taken from you and given to me”, he wrote, “and I choose to increase my consumption of precisely the same amount as those of which you are compelled to diminish yours, there is no Transfer Problem” (Keynes, 1929, p. 2). However, Keynes considered this as a special case. He argued that the transfer problem depends on the competitiveness of the industries of the debtor in the international markets (Keynes, 1929, p. 4). This means that the ability of the debtor to run a surplus in the trade balance, depends not only on his ability to export more (because of his higher productivity), but also on the *willingness* of the creditor to run a trade deficit, of an equal amount to the trade surplus of the debtor.

It follows, that in a monetary union (like the Eurozone), in which the creditors hoard their surpluses (Demopoulos and Yannacopoulos, 2016), the “automatic” adjustment mechanism, implied by the Ohlin’s argument, is blocked from the side of the creditor. In this case, m^* is close to zero, which means that $m+m^* < 1$ (from the assumption, that the marginal propensity to import is greater than zero but less than one). But if $m+m^* < 1$, then $dB/dT < 0$ (by the condition of (2)), which implies that the debtor suffers a deficit (after the transfer) in his current account, while the creditor enjoys a corresponding surplus. This means that the financial transfer T fails to generate the corresponding real transfer. The transfer is *undereffected*. In order to close the gap between the financial transfer and the real transfer, the debtor (who is a member of a currency area) has to deflate. Domestic deflation (internal devaluation) aims at stimulating exports by reducing their international prices in terms of imports. The effectiveness of this policy in restoring equilibrium (in closing the gap between real and financial transfer) depends, as Keynes has emphasized, on the *elasticity* of demand of debtor’s exports.

If the demand for exports of the debtor is price *elastic* (greater than unity), then a given reduction in the export price produces a more than proportionate expansion in the quantity of exports. The proceeds of the debtor country (expressed in common currency) obtained from this volume of exports are higher than those obtained from the previous volume of trade. This tends to bridge the gap between the real transfer and the financial transfer, and the danger of insolvency is removed. Thus, if the demand for exports of the debtor is price *elastic*, transfer can be *effected* and commodity markets can be cleared by a modest change in the terms of trade.

If the demand of exports of the debtor is price *inelastic* (less than unity), then a given reduction of the export price produces a less than proportionate increase in the quantity of exports. Since the proceeds of the debtor country obtained from this volume of exports are lower than those obtained from its previous volume of trade, the debtor suffers a real loss. Therefore, the gap between the real transfer and the financial transfer remains (if not increased), and a sale of assets or a new loan is needed to service the country’s debt. In this case, the transfer problem is a “hopeless business” (Keynes, 1929, p. 2).

In the limiting case, in which the elasticity of demand for exports is *equal to unity*, a reduction in the price produces an increase in the amount exported in the same proportion. Therefore, the proceeds from the exports remain the same. As Keynes (1980, p. 29) has remarked, “the debtor country is involved in a Sisyphus task and gets no nearer to equilibrium, however, great its efforts.”

Figure 2 (which is similar to the Figure 1) explains the *undereffected transfer*. The magnitude of the horizontal shift of the D curve is less than the magnitude of the horizontal shift of the S curve. In this case, the real transfer AC (i.e., the improvement in the trade balance of the debtor) is less than the financial transfer AB. Therefore, at the existing terms of trade, there is an excess supply, which is equal to CB. The restoration of equilibrium requires a *deterioration* of the terms of trade. The extent of the decline in the terms of trade depends on the elasticities of the D' and S' curves. The higher the elasticities, the smaller will be the change in the terms of trade. In the limiting case, in which one of the elasticities tends to *infinity*, no change in the terms of trade is required.

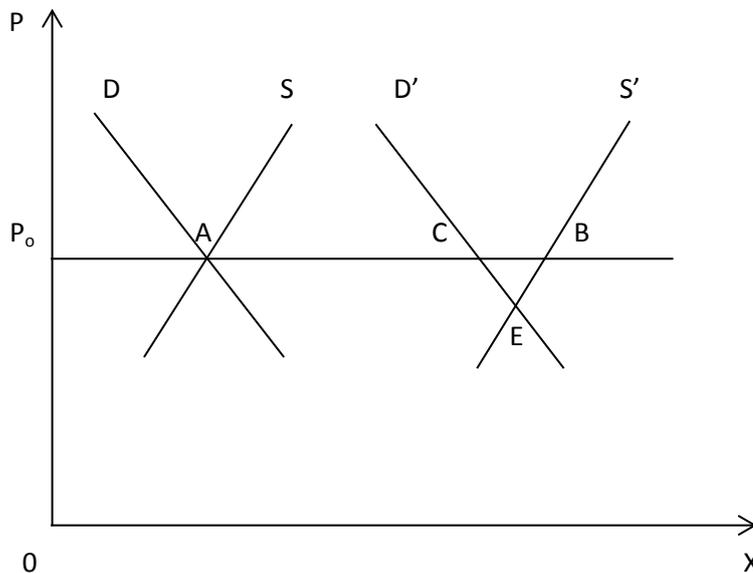


Figure 2
Undereffected transfer

3. The additional burden from the transfer

When the transfer is *undereffected*, the debtor has to deflate in order to bridge the gap between the real transfer and the financial transfer. However, domestic deflation (internal devaluation) may have some undesirable effects on the domestic economy of

the debtor. The mechanism that generates these undesirable results is explained below (see also, Demopoulos and Yannacopoulos, 2015).

3.1. Effects of deflation on the aggregate demand curve. The aggregate demand curve relates the output y with the price level p . It may be written in the form:

$$y = \varphi(p) \quad (4)$$

This curve has a *negative slope* for two reasons: First, is the *Keynes effect* (Keynes, 1936). The decline in the price level increases real money supply (the stock of money is considered as given). This leads to a decline of the rate of interest, given the liquidity preference, and to an increase in investment with positive effects on output and employment via the multiplier. This effect is expected to fail in the case of a liquidity trap, and in the case in which investment spending is completely inelastic to changes of the interest rate. Second, is the *Pigou effect* or *real balance effect* (Pigou, 1943, 1947; Patinkin, 1948). The decline in the price level leads to a higher value of wealth, which is expected to stimulate demand, and therefore output.

However, the *slope* of the aggregate demand curve may be affected by the fact that falling prices increase the burden of the debt. As Keynes has emphasized (Keynes, 1936, p. 264), falling prices increase the burden of the debt (both public and private), as well as, the burden of taxation, required to service or to repay the public debt. Increased taxation reduces spending, with negative effects of output and employment. The Pigou effect may be reversed by what we may call a *Tobin-Fisher effect*, as follows: As Fisher (1933) has remarked, an unanticipated deflation *redistributes* income from debtors to creditors making the creditors better off and the debtors worse off. If we assume that debtors have a higher propensity to consume than creditors (Tobin, 1980), then *this redistribution* of income 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 and/or as investors. In fact, as their debt/equity ratio increases *with deflation*, their credit lines tend to shrink or in the case of bankruptcies, disappear (Tobin, 1975;1980). Thus, falling prices are associated with a decline of spending and therefore output.

The effects of deflation on *the form* of aggregate demand curve may be analyzed with the help of the conventional IS-LM model, as in Tobin (1980, pp. 16-17).

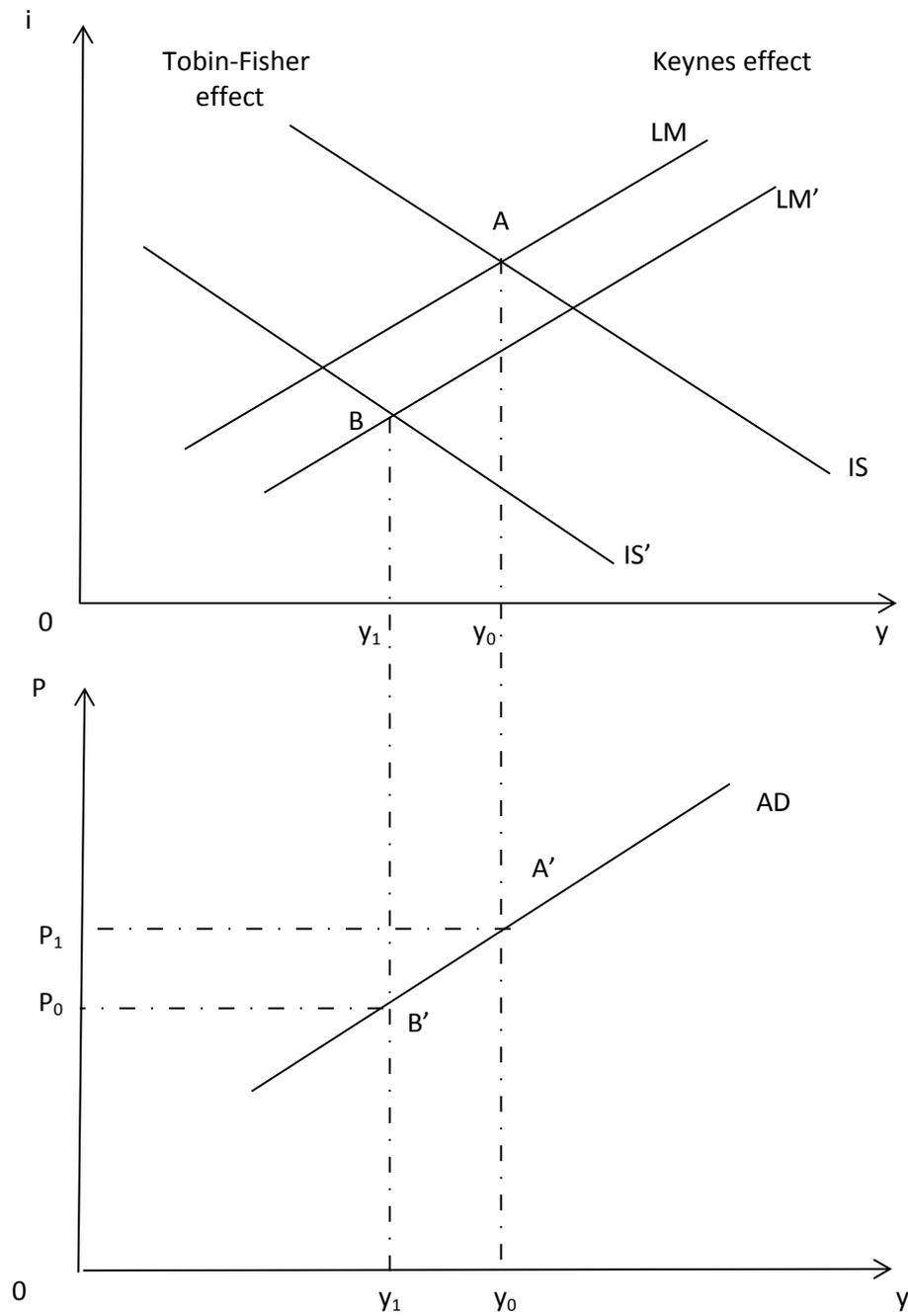


Figure 3

Tobin-Fisher effect and the aggregate demand curve

In this model (Figure 3), falling prices shift the LM to the right, because of the Keynes effect, and the IS curve to the left, because of the Tobin-Fisher effect. 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 Tobin-Fisher effect becomes dominant. The aggregate demand curve (derived from the IS-LM model and on the assumption that the Tobin-Fisher effect is dominant) is shown as AD in Figure 3.

3.2. Aggregate supply curve and the determination of domestic equilibrium. The aggregate supply curve relates the output supplied y_s to the price level p . It may be written in the form:

$$y_s = f(w/p) + z \quad (5)$$

where w is the nominal wage rate and z a shifting factor. It is assumed that the nominal wage w is determined by negotiations between employers and the trade unions and remains fixed for the period for which the contract is signed. It follows that an increase in the price level leads to a decline in the real wage rate and to an expansion of the output supplied. As a result, the aggregate supply curve has a positive slope. If we assume that nominal wages are perfectly elastic, as in the classical case, a change in the price level does not affect output and employment; the aggregate supply curve is perfectly inelastic at the full employment level of output. Thus, the slope of the aggregate supply curve is an index of the nominal wage flexibility.

Domestic equilibrium is obtained at the point at which the (positively sloped) aggregate demand curve is crossed by the aggregate supply curve. The fact that at this point (to be termed *the Tobin-Fisher equilibrium point*), both the aggregate demand and the aggregate supply curves have a positive slope, *raises the question* of whether this equilibrium *is stable*, i.e., whether the forces acting on the economic system are able to restore equilibrium following a shock. The static stability of this system depends on the assumptions we make about the behaviour of the relevant variables, when they are out of equilibrium (Gandolfo, 1997). On this, we may distinguish between two behavioural assumptions:

(i) *The system adjusts through changes in quantities.* This is the Marshallian behaviour assumption (Marshall, 1956, p. 288, note 1). A system is said to possess Marshallian stability if, when quantity is larger than the equilibrium level, the supply price associated with this quantity exceeds the demand price associated with this quantity, and the opposite holds, when quantities are less than the equilibrium level. Geometrically, 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 (Figure 4).

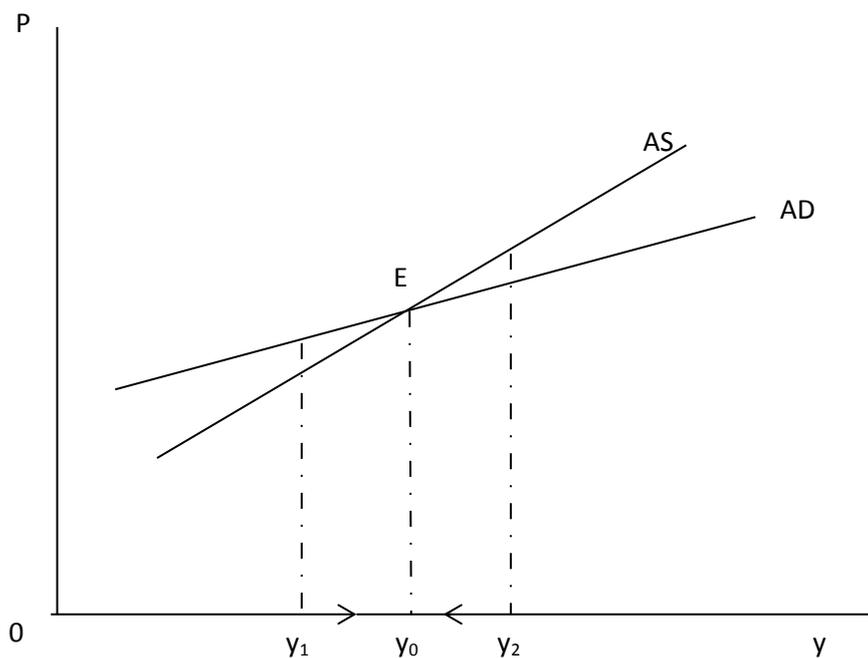


Figure 4

Marshallian stability

(ii) *The system adjusts through changes in prices.* This is the Walrasian behavioural assumption. A system is said to possess Walrasian stability if, when the price p is higher than the equilibrium level, the system exhibits an excess supply. And if the price p is less than the equilibrium price, the system exhibits an excess demand (Hicks, 1939, p. 62). Geometrically, this means that the equilibrium is stable, at the *Tobin-Fisher equilibrium point*, if the aggregate demand curve is *steeper* than the aggregate supply curve (Figure 5). Otherwise, it is unstable.

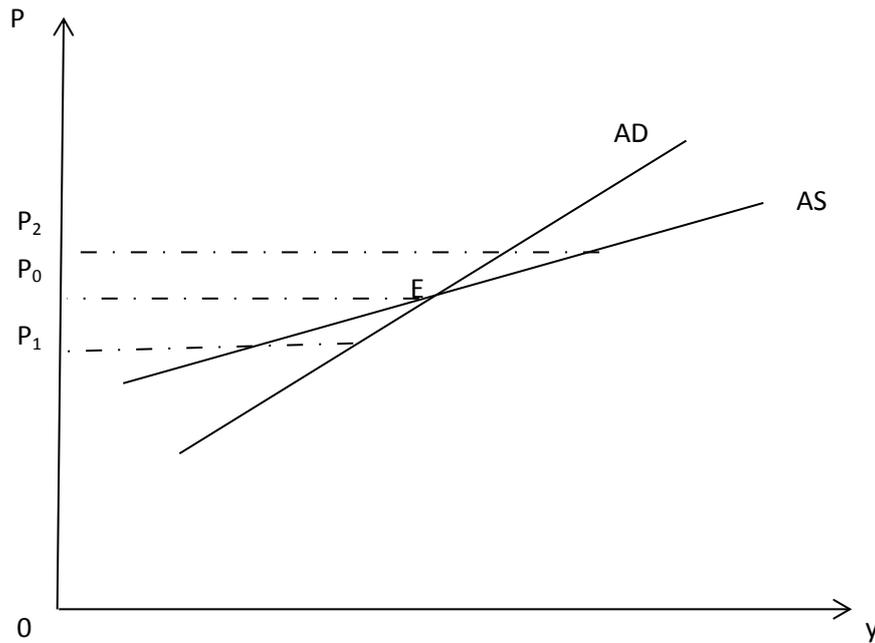


Figure 5

Walrasian stability

Note that the Walrasian stability (in the presence of a positively sloped aggregate demand curve) requires nominal wages to be relatively sticky. In fact, if nominal wages were fully flexible the economic system would be unstable (the aggregate supply curve could be vertical and, by necessity, steeper than the aggregate demand curve), and deflation would have no stopping point. This result offers a different interpretation of the “paradox” of flexibility discussed by Eggertsson and Krugman (2012, pp. 1487-1488).

In what follows, we assume that the system adjusts through changes in prices³. This may be justified by our assumption that the price is the independent variable and the quantity supplied the dependent one (see equations (4) and (5)).

3.3. Effects of falling costs on output and employment. We are, now, in a position to analyze the effects of the reduction of the relative costs of the debtor on the domestic output and employment. We will assume that the economy is in a stable equilibrium (in the Walrasian sense) at the point E (Figure 6):

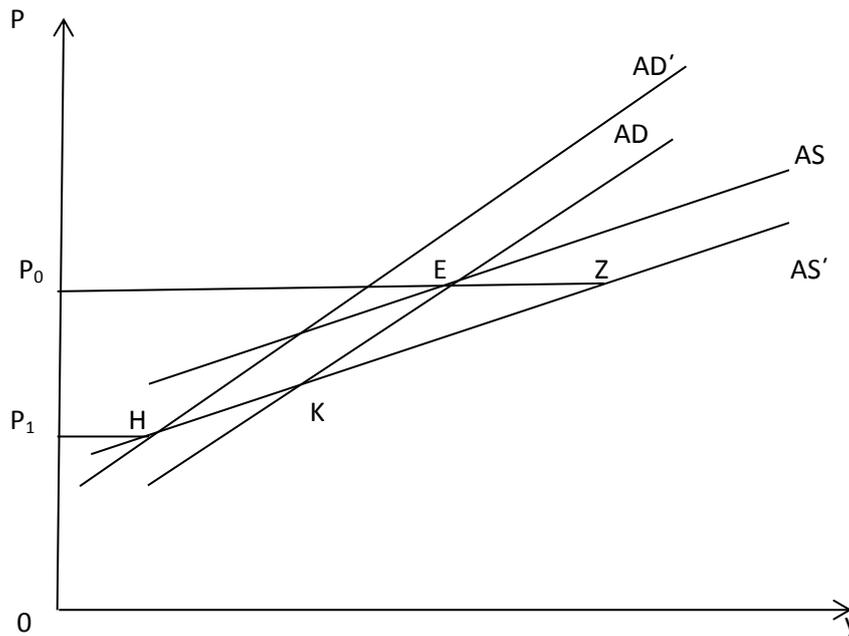


Figure 6

Failures of aggregate supply policies

Supply side policies, that reduce mark-ups or increase the flexibility of the labour markets, shift the aggregate supply curve down from the position AS to the position AS'. Given the price level p_0 , output tends to expand. This means that *reforms* create an excess supply equal to EZ, that leads to a fall in prices in accordance to the Walrasian behavioural assumption. The economic system shifts to the point K, at which corresponds, a lower output. This result is similar to the Eggertsson's toil "paradox" (Eggertsson, 2010)⁴. But K is not an equilibrium point. The reduced income, produced by the *aggregate supply policies*, will shift the aggregate demand curve to the left (Eggertsson and Krugman, 2012, p. 1486, note 13; Demopoulos and Yannacopoulos, 2015), making the *contractionary effects* of the supply side policies more severe. The new equilibrium point will be at H. Therefore, supply side policies that lead to a decline in the price level, amplify the negative effects of deflation, render the Tobin-Fisher effect more pronounced, and have *contractionary results*.

One may note, however, that while equilibrium at the point H is stable (in the Walrasian sense), it is unstable in the *social sense*, since such an equilibrium is associated with a reduced output and increased unemployment, and, therefore, is

connected with political disturbances and labour struggles, that are unavoidable in these cases.

Thus, any attempt to *unlock* domestic resources for the transfer, leads to a decline in the domestic activity and employment, adding an additional indirect burden on the debtor, in addition to the direct burden of the transfer.

4. Concluding remarks

The following conclusions are derived from the analysis of this paper:

In a currency area, in which the creditor countries *insist on hoarding their surpluses* the “automatic” adjustment mechanism, implied by the Ohlin’s argument, is blocked from the side of the creditor. As a consequence, the financial transfer fails to generate the corresponding trade surplus in the debtor country. The transfer is *undereffected*. The debtor suffers a deficit in his current account, while the creditor enjoys a surplus. In order to restore equilibrium, the debtor has to *deflate*. Domestic deflation (internal devaluation) may have *two* undesirable effects for the domestic economy of the debtor country:

(1) It may worsen its terms of trade. Domestic deflation aims at stimulating exports by reducing their international prices in terms of imports. The amount of price reduction required to stimulate a sufficient increase in the quantity of exports relative to the imports, depends on the price elasticity of demand of the exports of the debtor in the international markets. If the price elasticity of the demand of the exports is relatively high, then the transfer can be *effected* with relatively small changes in the terms of trade. But if the price elasticity of the demand for exports is less than unity, then the transfer is a “hopeless business”, because domestic deflation is unable to bridge the gap between the real transfer and financial transfer. The deficit in the current account of the debtor remains, and a *new loan is required* for the service of the debt.

(2) It may reduce domestic output and employment. In fact, improving competitiveness via deflation is likely to be a painful process, because deflation increases the burden of the debt and strengthens the Tobin-Fisher effect that leads to *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 case 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 declining output and employment. In such an environment, *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.

Notes

1. The literature on the transfer problem is immense. Apart from the papers referred to in the text, it includes contributions of Rueff (1929), Pigou (1932), Metzler (1942;1951), Samuelson (1952;1954), Johnson (1956), McDougall (1965), Jones (1970;1975), Dixit (1983), Brackmann and Marrewijk (1995), Corsetti, Martin and Presenti (2013), to mention only a few.

2. The negative effects of domestic deflation on economic activity and employment (and the high social cost associated with them) were emphasized by Keynes. “If (...) deflation is enforced,” he wrote, “how will this help? Only if, by curtailing the activity of business, it throws men out of work, so that, when a sufficient number of millions are out of work, they will then accept the requisite reduction of their money-wages. Whether this is politically and humanly feasible is another matter.” (Keynes, 1929, p.7).

3. This view is also accepted by Eggertsson and Krugman (2012). They argue that the aggregate demand curve, while backward sloping, has to remain steeper than the aggregate supply curve, because otherwise, “the short run equilibrium will be unstable under any plausible adjustment process” (Eggertsson and Krugman, 2012, p. 1485, note. 11). This is not correct, since a system which is unstable in the Walrasian sense, is stable in the Marshallian sense.

4. The question is whether these negative effects of the supply side policies are offset by shifts of the aggregate demand curve. A number of economists (see, for example, Eggertsson *et. al.*, 2013) argued that structural reforms, if credible, create a wealth effect that increases permanent income that stimulates both present and future expansion. This view presupposes that economic agents are not liquidity constrained and, therefore, they are able to optimize their inter-temporal consumption function, subject to their inter-temporal budget constraint. The assumption that consumers are not liquidity constrained is not valid in a world in which the Tobin-Fisher effect is dominant.

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