FISCAL DEVALUATION*

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ABSTRACT

This article discusses the state of the art relatively to policy makers decisions when the use of the nominal exchange rate is no more feasible. Namely we describe the existence of a set of instruments, conventional fiscal instruments, which under rather strict conditions, can replicate the effects of a nominal devaluation. However this is a relevant question when there is no doubt on the desirability to use the exchange rate as a policy instrument. Therefore, the two question will be jointly addressed in this article.

1. Introduction

The need for adjustment that is nowadays common to a large set of economies re-opens the question of which instruments should policy makers use. This question is more relevant for the euro area countries since each individual country cannot use nominal devaluation and this is a typical recommended instrument for that adjustment.

This article aims to review the state of the art in terms of the alternative instruments available for an economy when the change of the nominal exchange rate is not an option. However that question is only relevant when it is clear that such nominal devaluation is an efficient instrument to be used. Therefore both questions have to be taken together. As we will try to show using very stylized models of the economy the answer to the last question is much more difficult than the answer to the first one: there is little consensus on the ability of nominal devaluation to be the right instrument. The desirability to devalue is highly dependent on the shocks that hit the economy, and created the need for adjustment, as well as on the transmission mechanism both of those shocks and of the change in the exchange rate. These transmissions depend mainly on the frictions that characterize the economy under analysis. More than having an answer to the latter question we try in this article to explain why it is a difficult problem. On the contrary we will show that the question of the existence of instruments equivalent to the nominal devaluation is an easier one, once the other one is solved.

The idea that tax reforms can mimic the effects of exchange rate devaluation is not new. The legislation on the value added tax in the European Union establishes a taxation of goods on the destination basis (according to where they would be consumed) and is essentially equivalent to an exchange rate devaluation, because imports are taxed while exports are exempted.

This is an older idea of the time of the gold standard, as we can see by the following quotation by Keynes (1931):

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* The opinions expressed in the article are those of the author and do not necessarily coincide with those of the Banco de Portugal or the Eurosystem. Any errors and omissions are the sole responsibility of the author.

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“Precisely the same effects as those produced by a devaluation of sterling by a given percentage could be brought about by a tariff of the same percentage on all imports together with an equal subsidy on all exports, except that this measure would leave sterling international obligations unchanged”.

When these instruments are not available the increase in the nominal exchange rate can be replicated with an increase of the VAT tax when this is imposed on imports and reimbursed on exports. To avoid effects on prices of goods that are not traded with foreign countries (tradables or nontradables) the impact of the increase of VAT on prices should be compensated by a decline on the other tax paid by firms on the same base, that is the payroll tax.¹

2. Devaluations

Exchange rate devaluations would have no real effects if prices and wages were flexible. In this case every price would move with the exchange rate so that relative prices would remain unchanged and there would be no real effects of the devaluation. When every price (including wages) is flexible the change in the exchange rate can be seen as merely a change in the unit of account used for transactions. After Milton Friedman it was clear that one advantage of having a system of flexible exchange rates would be the “gains of coordination”. After a real shock that calls for a change in relative prices this change could be achieved through a move of nominal prices and wages or, for some of those, by a change in the exchange rate. Introducing some costs of changing prices and/or wages will lead to a preference for a flexible exchange rate as a substitute for movements in nominal prices.

The argument for a flexible exchange rate is, strange to say, very nearly identical with the argument for daylight savings time. Isn’t it absurd to change the clock in summer when exactly the same result could be achieved by having each individual change his habits? All that is required is that everyone decide to come to his office an hour earlier, have lunch an hour earlier, etc. But obviously it is much simpler to change the clock that guides all than to have each individual separately change his pattern of reaction to the clock, even though all want to do so. The situation is exactly the same in the exchange market. It is far simpler to allow one price to change, namely, the price of foreign exchange, than to rely upon changes in the multitude of prices that together constitute the internal price structure. (Friedman (1953)).

Nominal devaluations have been seen as an important policy instrument. This instrument is effective when the economy displays nominal rigidities. However its efficiency depends on the nominal exchange rate having, directly or indirectly, effects on relative prices which are not flexible and were distorted by the real shocks that caused the need for adjustment. The rigidities can be temporary and the devaluation then just alleviates the temporary distortions that characterize the economy. These rigidities disappearing in the long run, when every price is flexible. But as we said in the long run the change of the nominal exchange rate is neutral. Alternatively the rigidity can be permanent, meaning that every agent has no incentive to change the price, and in this case the devaluation continues to have effects in the long run. Therefore it is normal that the effect of a nominal devaluation depends heavily on the type of nominal rigidity that is stronger in the economy, as well as the analysis of the transmission mechanism of the devaluation, which depends crucially on the sectorial characteristics of the economy represented in the model.

¹ The base of the tax on the value added is the return of the primary inputs in production. Therefore the compensation should be executed with a tax that is paid by the firm on the same basis.
The nominal devaluation also has an additional effect to the one just described: it can lead to important aggregate wealth effects, and the magnitude and sign of these effects depend on the assets portfolio held by the private and the government sectors in the economy. If those agents hold assets and the devaluation is unexpected the value in foreign currency of assets denominated in domestic currency changes. This can generate substantial wealth effects that significantly changes the equilibrium, even if prices and wages were perfectly flexible.

Except for the wealth effect just described, the devaluation tries in most models to replicate the equilibrium of flexible prices (and wages). Therefore we can say that its efficiency depends on three things: 1) the ability to replicate those flexible prices using just one instrument; 2) the desirability of replicating flexible prices, given other distortions that normally characterize the economies; and 3) the wealth effects that are created by the devaluation, which can interact with point 2).

Notice that, even if we are always taking into account a permanent devaluation, it is difficult to call it a reform since, as we said in the beginning, in most environments this policy is neutral in the medium/long run.

### 2.1. Fiscal devaluations

As we just said the idea that tax reforms can mimic the effects of exchange rate devaluations can be found already in Keynes (1931). The idea that this simple policy can be not completely equivalent to a nominal devaluation called for a recent discussion with a different set of ideas coming to the public discussion (e.g. Cavallo and Cottani (2010)), to policy prescriptions (Franco (2010)) and BoP (2011), and to academic work (Farhi et al. (2011)). The main focus is on the so-called fiscal devaluation where the main instruments used are a VAT increase and a decline of the employers’ social contributions (SC).

We will now discuss both the effects of a nominal devaluation and the existence of fiscal instruments that can replicate a nominal devaluation into three different models. They will be introduced by increasing complexity.

### 2.2. The model of unemployment – Model 1

Let us take the simplest model that reflects the nominal rigidity that is common to most models that are able to replicate reality nowadays, the nominal wages rigidity, and that interferes with devaluation. Schmitt-Grohe and Uribe (2011) employ this kind of model to analyze the costs of a fixed exchange rate, abstracting from any other type of distortion or of rigidity.

The economy is described as a small open economy with a representative household that consumes tradables \((C_T)\) and nontradables \((C_{NT})\). This household holds a real bond in units of the tradable good. The supply of tradables \((Y_T)\) is a fixed endowment for this economy and total labor supply \((h)\) is constant and free to be used in the production of nontradables, which has only one input of production.

The price of the tradable good \((P_T^*)\) in foreign currency is given from abroad and prices of nontradables \((P_{NT})\) are perfectly flexible. Firms, that produce the nontradable using just labor, operate in a competitive market, taking prices and wages as given. Optimal decision of these firms leads to

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2 Both Franco (2010) and BoP (2011) try to describe the quantitative impacts of a tax reform similar to a devaluation: an increase of the value added tax compensated by a decline of the payroll tax. None of these works guarantee that this reform is equivalent to a nominal devaluation. The results obtained in BoP (2011) are derived from the model developed in Almeida et al. (2010).
where $p$ represents the real exchange rate, the relative price of goods, and $F'$ the marginal productivity of labor used in production, represented by $h$. The real wage in units of the tradable is represented by

$$w = \frac{W}{EP_f}.$$ 

Clearing of the nontradable is guaranteed by $F(h) = C_{NT}$. The nominal wage, $W$, is downward rigid. In this case the labor market does not clear and unemployment is given by $\tilde{h} - h$, being $\tilde{h}$ the inelastic labor supply. The trade balance is given by $Y_T - C_T$ and net external debt, in units of the tradable, is given by $d_{t+1} = (1 + r_t)d_t + C_{TT} - Y_{TT}$. The real interest rate, $r_t$, is exogenous.³

In this model if a devaluation is implemented under full employment it will be neutral since the only effect would be an increase in $P_{NT}$ and $W$, and given the same real exchange rate and real wage the allocations are maintained.

When the economy is characterized by unemployment this means that the nominal wage is too high (relative to the full employment one) and will not decline, as the nominal wage is sticky downwards. This leads to a real wage and to a real exchange rate which are too high. In this case a devaluation declines the real exchange rate increasing the consumption of nontradables relative to the consumption of tradables, declines the real wage in terms of tradables increasing employment and the production of nontradables and declines unemployment. Because the consumption of tradables declines and the production of tradables is fixed, the trade balance improves and external debt declines. The devaluation leads to an expansion and to a better position in external accounts. Notice that in this very simple model if the price of the nontradable good was also sticky the results would be similar, because in the described transmission of the devaluation the change in the relative price of goods occurs through the exchange rate. The price of nontradables plays no role in the adjustment described and is constant.

What caused the unemployment? – To understand the desirability of a devaluation, or any other policy, we should understand to which shock that specific policy is reacting. In the present case we could have for example a historically high nominal wage, resulting from the power of insiders versus outsiders in the labor market. As we just described, this high nominal wage (and its persistence) caused unemployment, too low consumption of nontradables, too high consumption of tradables, too low trade balance and too high increases in external debt. A devaluation has similar effects than a fall in the nominal wage. Notice that these effects occur even if the real wage is always identical to productivity. We cannot say that the external positions are due to wages being higher than productivity as usually measured. In this very simple model a decline of the nominal wage would have identical effects to the devaluation, therefore the devaluation is replicating flexible wages, and flexible prices (wages) achieve the first best in this simple economy.

In this model the real rigidity comes when the downward nominal wage rigidity is coupled with a fixed exchange rate. In this case the real wage in units of the tradable is sticky. When there is a relative scarcity of the tradable good and therefore a relative abundance of the nontradable one the price system is not effective in signalling it.

³ And in Schmitt-Grohe and Uribe (2011) negatively correlated with $Y_T'$. 

\[
\frac{P_{NT}}{EP_f} = p = \frac{w}{F'(h)}
\]
In the paper by Schmitt-Grohe and Uribe (2011) the unemployment was caused by a real shock represented by a decline of the endowments of the tradable good. This can be interpreted as a loss in the terms of trade, or a loss in external assets. In this case the allocations after the shock without a reaction of the exchange rate, would be characterized by a reduction in the consumption of nontradables and therefore higher unemployment, and by a reduction in the consumption of tradables (higher than the decline in the endowment if the real interest rate also increases given the worse situation of the economy). This leads to a positive trade balance associated with an increase in external debt if the real interest rate increases. Notice that in this model the shock does not move the relative price of nontradable, even if we assume as here that the nominal price on nontradable is perfectly flexible: the rigidity of the marginal cost in units of the tradable leads to a constancy of the relative price of nontradables, and of the real exchange rate.

If instead of a fixed nominal wage the economy was characterized by a fixed price of nontradables the results would be identical: without a reaction of the nominal exchange rate the real exchange rate is constant, implying that the ratio of the consumption of tradables and nontradables is maintained. The shock leads to a decline in the consumption of both goods and therefore to a lower value of $h$ that clears the nontradable sector. Even if wages were flexible the value of $W$ would not move with the shock. Then in this model the results are identical whether are wages fixed, or the price on nontradables is fixed or both are fixed.

A devaluation that reacts to these shocks can return the economy to full employment, together with an increase of production (of nontradables), an increase of the trade balance and a decline of the debt. Again given the exogenous shock in this very simple model the devaluation has the ability to guarantee the first best, which is characterized by a recession and a large positive effect on the trade deficit. While the first best is obtained with a devaluation and is therefore characterized by a recession, it does not allow us to state that the devaluation per se is contractionary. The real shock, given the rigidity, creates a recession too strong, and the devaluation corrects in part that recession, because as we have seen the devaluation is expansionary. However as the fall of output due to the real shock is larger than the reaction created by the devaluation the joint result is still a contraction of output.

The real rigidity that occurs in this model is due to the nominal wage rigidity and when the exchange rate is fixed it is the only distortion present in the model. This leads to a very tractable model that includes the main channel that is referred when there is a devaluation: the change in terms of trade and the change in the costs of labor, in units of the tradable.

When we look to the euro area these problems become more acute the higher the initial nominal wage rate relative to the full employment, the more unionized the country, the higher the country risk, the higher the level of external debt and the higher the deterioration in the terms of trade.

**Fiscal devaluation** – In this model the proof that there are fiscal instruments equivalent to the nominal exchange rate is very simple. As we saw the distortion arises when, given the downward nominal wage rigidity, the exchange rate is fixed and it creates a real wage rigidity (real wage to the producer in units of the tradable). Then the problem is solved if there exists an instrument that can lower the real wage in terms of tradables and the real exchange rate. This can be done with a subsidy to labor paid to firms, or a decline in the payroll taxes, $\tau^p$, if those were already paid by firms.

\[
\frac{P_{NT}}{EP_T^p} = p = \frac{(1 + \tau^p)w}{F'(h)}
\]
Notice that in this very simple model the payroll can be reduced just for the firms that produce the nontradable good. This will decrease unemployment and the relative price of nontradables. It is the relative reduction in the consumption of tradables that allows for the better trade balance and lower external debt. In this case the financing of the subsidy (or the compensation of the lower payroll tax receipts) can be done with a tax on labor paid by workers, that in this simple model is lump sum. The same would happen with a value added tax (or a common consumption tax on tradable and nontradable goods that is also lump sum). It is the sum of the reduced payroll, and this lump sum used to financed it, that replicates the effect of the nominal exchange rate in this model, and can therefore be called fiscal devaluation. In this model the composition of taxes that replicate the nominal devaluation is very simple, both due to the inelastic supply of labor and to the assets held by the households being denominated in foreign currency.

2.3. A similar model – Model 2

Let us now consider a model economy slightly more complex. Let us take the model used by Farhi et al. (2011) in its simplified form, which turns out to be an equilibrium model very similar to the one just described. It's a small open economy with a constant real interest rate and where households just hold foreign assets. Consumption is composed of a good produced domestically and a good that is imported. Contrary to the simple model described in the previous section, here every good in the model is tradable. Labor creates a disutility for the household and therefore labor supply is elastic. The home producer sets the price in home currency, \( P_h \), and the foreign producer in foreign currency, \( P^* \). In the simplified model these prices are flexible but nominal wages are sticky but not fixed. Wages react just in part to contemporaneous information.

Let us assume that in this environment the economy suffers a real shock, a significant unexpected permanent drop in domestic productivity. In reaction to this shock two relative prices should adjust in the model economy: the real wage and the terms of trade, \( \frac{w_p}{P^*} \). Both should decline. With sticky wages, the nominal wage declines slowly, converging to its flexible price value over time. Then the flexible price of the domestic good increases also slowly to its higher value in the long run. This leads to a lower value for the terms of trade which increases over time to its long run value. Then given the relatively higher wages (relative to the flexible wage equilibrium) labor is lower as well as output. The lower value for the terms of trade, that is a lower relative price of imports, leads to a lower value for the trade balance and to a decline in external debt. In this environment a devaluation can replicate the effect on the economy of the lower productivity with flexible wages. The devaluation is the amount necessary to allow a constant wage to replicate the flexible wage allocation with a zero devaluation. This implies that the devaluation has to be symmetrical to the long run decline of sticky nominal wages following the decline in productivity. In this way output declines less than without the devaluation and the trade balance as well as external assets do not react to the shock. Compared with the equilibrium without the devaluation the change in the exchange rate was expansionary and led to an improvement in the trade balance.

In this case the nominal rigidity of the nominal wage and of the home produced goods price are no longer equivalent. In the case of a flexible wage but a sticky price of home goods the slow price increase, until matching the new long run value, leads to a higher value for the terms of trade, for output and for external balances (each one relative to the value they take in case prices were flexible). The change of the exchange rate is now a revaluation. Therefore here we would still observe a contraction of output and a negative trade balance (consumption on tradable goods increases) but the efficient solution would be a revaluation of the nominal exchange rate. When both rigidities coexist the optimal exchange rate policy is not general to every parametrization of the model, and the first best would not be attained.

4 If we had a model with production of the tradable (instead of being an endowment) then the payroll tax should be lowered for every firm, producing either nontradable or tradable.
If we compare model 1 with this model it is important to notice that very small changes in the environment lead to a much more complex model in terms of exchange rate policy.

**Fiscal devaluation** – In this model the nominal devaluation could again be replicated with fiscal instruments: The increase of the VAT would replicate the effect on the price of imports in domestic currency of the nominal devaluation. Assuming an identical passthrough for the VAT and the SC (let us assume that is zero), the decline of the payroll tax would offset the effect of that VAT on the setting of the price of the good produced domestically. Therefore a nominal wage and a price of home goods in domestic currency identical to the ones that would occur with a nominal devaluation as a reaction to the real shock can be accomplished. As we assumed that the VAT can be deducted for goods that are exported, the price of exports is also the same as the one obtained under the nominal devaluation. In this way as a reaction to a particular shock, whatever is the preferred nominal devaluation, there is a fiscal devaluation that decentralizes the same equilibrium.

2.4. An even more complex model – Model 3

Burstein et al. (2007 and 2005) argue that large devaluations are generally associated with large declines in the real exchange rate and concomitant low rates of inflation and they argue that the primary force that induces these low rates of inflation is the slow adjustment in the price of nontradable goods and services, not the slow adjustment in the price of goods that are imported or exported. However contrary to the models described before such rigidity of the nontradables prices is not a characteristic of the short run reaction of firms but characterizes the economy both at short and long horizons.⁵

Let us describe a more complex model that includes a production function for tradables, labor supply is endogenous and it has a more complex structure of production. This model is based on Burstein et al. (2007). As before, consumption is an aggregate of consumption of tradables and consumption of nontradables. The household holds a nominal bond in foreign currency with a constant interest rate. Note that we are still not introducing the additional complexity of the devaluation effects on balance sheets.

To simplify let us assume that the tradable consumption is imported. The price of this good “at the dock” in domestic money is simply $E$. To sell one unit of this good it is necessary to distribute it. It requires $\varphi$ units of the final nontradable good. Then the price to the consumer is

$$ P_T = E + \varphi P_{NT} $$

Exports are produced with labor with a linear technology. The market is monopolistically competitive and exporting firms face an external demand with a constant price (in the foreign currency) elasticity of $\gamma$. The price charged by this sector is given by⁶

$$ P_X / E = \frac{\gamma}{\gamma - 1} \left( W / E + \varphi^* \right) $$

Consumption of the nontradable good is produced by competitive firms that use nontradables intermediate goods as inputs. These intermediate goods are produced with labor in a monopolistic competitive market. Prices in this sector are given by

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⁵ That the rate of passthrough from exchange rates to prices is much lower for nontradable goods than it is for goods that are actually traded is documented in Burstein et al. (2005).

⁶ Where $\varphi^*$ represents the equivalent to $\varphi$ in the foreign market.
\[ p_i = \frac{\varepsilon_i}{\varepsilon_i - 1} W / A^X \]

where \( \varepsilon_i \) is the demand elasticity of good \( i \).

Therefore we have two important margins where the exchange rate interacts with other prices: the intratemporal marginal rate of substitution between consumption of tradables and nontradables (the real exchange rate) \( \frac{E + v P_{xt}}{P_{xt}} - W = \frac{E}{W} + \varphi; \) and the intratemporal margin between labor and consumption (the real wage) \( \frac{E + v P_{xt}}{P_{xt}} P_{xt} \). In addition we have the price of exports in foreign currency that determines the volume and therefore the value of exports \( \frac{P_X}{E} = \frac{W}{E + \varphi^*} \).

It is assumed that prices of nontradables are sticky and test, a fortiori, whether there are gains for an individual firm to deviate from the price set before. When there are no incentives to deviate the stickiness is, contrary to what happened in the models described before, a permanent one.

A devaluation in this model would have no real effects if every price (and the nominal wage) was flexible. However if the price on nontradables is fixed this is no longer true. After a devaluation the relative price of consumer tradables increases and therefore the consumption of nontradables increases, as well as the production of those goods. Hours worked increase as well as real wages. Nominal wages increase more than the CPI but less than the devaluation and therefore the price of exports decreases and the volume of exports increases. Given that this is a permanent shock and there was no change in the value of external assets the value of exports and the value of imports in foreign currency increase by the same amount.

The mark-up of nontradables declines and the loss of keeping prices constant is large. Therefore when the only shock is a devaluation there is a huge incentive for these firms to increase prices, and the economy would converge to the flexible prices economy.

However if we begin by asking to what shock are policy makers reacting when deciding to devalue the currency the stability of the price set in advance can be maintained. One reason pointed out in Burnstein et al. (2007) for the devaluation is the reaction to a negative real shock, like a fall in terms of trade or a decline in assets. This permanent shock will lead to an increase in the trade balance. This is obtained both from a decline in imports and an increase in exports. The price of exports decline and therefore the nominal wage declines. The real wage declines and the same happens to the labor supply. Both the price of tradable and nontradable consumer goods are constant, and the real exchange rate is constant. Therefore the consumption of both goods decline.

Will the devaluation achieve the first best in this case? No. In this case with flexible prices total hours should decline more, hour in the production of exports should have increased more, as well as the volume of exports, and consumption of both imports and nontradables should have declined more. However it is true that the overvaluation caused by the negative real shock with sticky prices, that created a high real exchange rate and a high contraction (higher than the one that should have occurred with flexible prices), is minimized by the devaluation that leads to an expansion of the activity and to a realignment of the real exchange rate.

Contrary to the case of just a permanent devaluation, when we take together a devaluation plus the real shock the incentive of the firm to adjust its prices is eliminated and therefore the resulting equilibrium can be seen as a sustainable equilibrium.

**Fiscal devaluation** – Could we replicate the nominal devaluation using fiscal instruments in this model? Using the important margins and prices affected by the nominal exchange rate we can see that if a VAT, \( \tau_v \), was already taken as part of the decision when setting \( P_{xt} \) (zero passthrough), and if it is...
imposed on the prices of imports then \( \frac{(1+\tau_v)E+\tau_P}{\tau_P} \). The VAT is a perfect substitute of devaluation in this intratemporal margin. Also necessary would be a deduction of the VAT on the price of exports and a decline in the payroll tax to replicate the effect of the devaluation on export prices in domestic currency. That is \( P_N = \frac{1}{\tau_N}(1+\tau_P)(1+\tau)W \) in domestic currency and \( P_N / (1+\tau_N)E + \varphi^* \) in foreign currency.

With a fixed \( P_{NT} \), the intratemporal margin between labor and consumption is replicated as long as the real exchange rate is maintained. In summary the nominal devaluation can be replicated with a fiscal devaluation that uses an increase in the VAT with zero passthrough, completely deducted on exports and imposed on import prices, and a decline on the payroll tax.

As \( P_{NT} = \frac{1}{\tau_N}(1+\tau_P)(1+\tau)W / A^X \) the incentives to maintain the price would be identical in the nominal or fiscal devaluation.

3. Important caveats

The passthrough – We just showed that a nominal or a fiscal devaluation can reach the same allocation, using for the fiscal devaluation an increase in the VAT identical to the increase of the exchange rate and a decline of the SC such that \( (1+\tau_v)(1+\tau_P) \) does not change after the increase of the VAT. In every model described we imposed three characteristics that were important for this result: 1) the first is that external assets (or liabilities), both for the private or the government should be denominated in foreign currency; 2) the second is that the passthrough of the exchange rate and the tax on value added should be identical in import and export prices; and 3) the third is that the passthrough to domestically produced goods prices of social contributions by firms and the value added tax is the same.

Let us begin by discussing whether 2) and 3) are plausible. This is a difficult question because it should be tested empirically but there aren’t many episodes where, under the same environment both types of experiments were performed: a country that made a large permanent devaluation and a large permanent increase in VAT, and where these effects can be distinguished from other shocks in the economy; and a country that made a large permanent change in social contributions paid by firms and large and permanent increases in VAT. There are some examples of changes in VAT and large devaluations, not necessarily in the same environment, and a few experiences of lower social contributions in a small scale. Crossing this evidence we can say that with some probability the passthrough of VAT and exchange rates on imports and exports prices are similar. This is the result of the evidence for devaluation of Berstein et al. (2005) for no slow adjustment in the prices that are imported or exported after a large devaluation. And the institutional framework described initially that the VAT should be imposed on import prices and deducted from export prices. Notice that these elements are very weak for the validation of the hypothesis imposed.

However, the confidence on the same degree of passthrough for VAT and SC is much lower. As we said the experiments and studies of changes of SC taxes are very scarce. What happens if the assumption is a different one? The first problem is that every firm should have the same degree of passthrough for each one of those taxes. If this does not happen and we impose the same change across the board we will create a distortion through changes in relative prices which can have, as it is well known, large costs for the economy. The second problem is that even if every firm has the same passthrough, and is not zero as we assumed in our examples, we have to know precisely how the change in VAT can be compensated on the pricing decisions by a change in SC. There is a special case where we know that the fiscal devaluation is no longer equivalent to the nominal devaluation: it is the case in which the passthrough of VAT is complete and the passthrough of the SC is zero. In this case, as shown in Adão et al. (2008), the equivalence needs another fiscal instrument, that differentiates between goods produced domestically and abroad. This type of instrument cannot be used in the European Community or in any free trade zone.
**The balance-sheet effects** – The assumption 1) is also extremely important for the results: when external assets held by households (or by the government) are denominated in foreign currency the devaluation does not affect its value in foreign currency. But as referred in the Keynes’ quotation written above, the fiscal devaluation (in his case using tariff and subsidies) leaves liabilities in domestic currency unchanged what is not true with the nominal devaluation. When a country devalues the value of its external liabilities (denominated in domestic currency) decline in foreign currency. Therefore with positive net assets the devaluation leads to a decline in wealth, while negative net assets it would lead to a positive wealth effect. But what if the assets are denominated in domestic currency and the external debts in foreign currency? In this case the devaluation creates a negative wealth effect, measured in foreign currency. This effect on wealth has no counterpart when we use instead a fiscal devaluation. Farhi et al. (2011) suggests that the fiscal devaluation should be complemented in this case with a transfer between the domestic economy and abroad to achieve the equivalence with the nominal devaluation. For a composition of assets in which a devaluation leads to a negative wealth effect, the fiscal instruments described above should be complemented with a transfer from the domestic country to abroad, or by a partial default of foreign countries on the assets held by domestic agents. The opposite should occur when the nominal devaluation leads to a positive wealth effect.

Notice that in addition to the need for a nonstandard fiscal instrument to guarantee the equivalence, the effects of the nominal devaluation in reaction to a particular shock should be also amended relative to the ones described before.

**4. And what about “Competitiveness”?**

As we just described the fiscal instruments have some ability to replicate nominal devaluations. However may be the most important question is not whether we can replicate the nominal devaluation but whether, having the policy maker the ability to change the exchange rate, should he use it? One reason appointed to explain the recent interest on the fiscal devaluations is the fact that a country that belongs to a monetary union or to a currency board lost an (the) instrument to gain competitiveness. In this section we will try to explain this sentence by describing the connection that exists (or not) between competitiveness and devaluation.

In case we interpret the gain in competitiveness as an increase of total productivity in domestic production, this will lead to the increase of the level, and probably of the growth rate of output, at least in a transitory path. The effect of this permanent shock over the trade balance will, in principle, be negative, when the increase of productivity increased the capital productivity and the investment. However this is a favorable change because the increase of the productivity represents new investment opportunities, higher consumption and higher welfare.

Nothing similar to what is described in the last paragraph happens with a devaluation. How can the two concepts still be related?

Let us say that a country has an external imbalance that calls for an adjustment when it has systematic trade balance deficits. Can in this case a devaluation that improves the situation of the external accounts be interpreted as an intervention that improves the competitiveness? As we have seen the devaluation can increase the volume of exports through the decline of its prices in foreign currency, and assuming that the external demand reacts to changes in prices. In a simplified way the effect on the value of exports depends on the demand price elasticity of those goods. Let us assume that the impact of the devaluation on the value of exports is positive. The effects of the devaluation on imports is simpler: given the price in foreign currency its price in domestic currency increases. Ceteris paribus this will lead to a decline in demand by domestic agents of imported goods. Therefore the devaluation will have a positive effect of the trade balance. Is that change desirable for the economy? Notice that this answer cannot
be given without understanding why the initial imbalance occurs. If we look simply at the effect of the
devaluation described until now it will improve the balance of trade, and if strong enough it will reduce external debt, but at the cost of a loss in terms of trade: the country now exchanges one unit of exports for a much smaller volume of imports. And, in a way, this is exactly the opposite from the gains that a country can have from trading with the rest of the world (and of competitiveness in strict sense). The gain from trade derives from the ability that the country has to exchange a good that has a higher value abroad for another that has higher value domestically. That is, because it improves the terms of trade.

If, however, we take into account the shock that is the origin of the “disequilibrium” in the external accounts, nominal devaluation can, as we saw, alleviate the effects of this shock that are derived from the existence of nominal rigidities. Due, for example, to a decline in total productivity, nominal rigidity could imply a relative price of exports to imports, higher than the one that would occur without the existence of nominal rigidities. This leads to a deficit in the balance of trade, but the country is importing a lot for each unit that is exported. In this case a deterioration of the terms of trade can improve the situation of the economy, even if we say that the country is less competitive because it declined the prices of exports for the same productivity.

A second way to connect competitiveness with devaluation is to analyse the effects on real wages for a given productivity. What is equivalent to understanding the effects on relative labor costs (relative to those costs in our trade partners). The real wage declines after a devaluation. Then for the same productivity the “competitiveness” would have increased. If we were analyzing the devaluation as a reaction to a shock we have seen, for example in model 2, that when there is a negative shock in total productivity and the exchange rate reacts to that shock, the real wage declines. However the real wage declines less than the decrease in productivity. The gap between the productivity and real wages, in the equilibrium when the only shock is the decline in productivity, is larger than the gap when the devaluation reacts to that shock. As we saw this is a better outcome for the economy but it is difficult to derive the link between the evolution of labor costs and competitiveness.

In most models where devaluation has real effects due to nominal rigidities the devaluation that can aim at correcting the nominal rigidity after the permanent shocks has uniquely temporary effects. This is derived from the usual nominal rigidities being temporary, and the more temporary the larger and more permanent is the shock. This means that a devaluation in those environments has a very short run effect. Competitiveness is a medium to long term feature of the economy and therefore it is not clear whether a devaluation should be seen as a measure to solve problems of “competitiveness”. In the particular case of the third model presented the sticky price is of a very different nature than the ones usually analyzed in the literature. There the stickiness can be permanent. However the question is not easy here because if there would be no devaluation the price would be revised after the shock and it is the devaluation that leads to a permanent constant price. So again here it is difficult to argue that the devaluation is a measure that increases competitiveness.

5. Conclusions

We have shown in this article that there are fiscal instruments which can be used to replicate a nominal devaluation. We show that in specific conditions an increase of the tax on the value added compensated by a decline of social contributions paid by firms can play this role. Note that the adjustments in fiscal policy are not automatic and would require a knowledge of the model and the shocks to be fully effective. But the movements in exchange rates that would be necessary to accomplish the same goal could be market determined, but would not be automatic either. The information that is necessary to conduct policy under flexible exchange rates so that the path for exchange rates is a particular one is exactly the same information necessary to affect directly the relative prices using tax rates.
However we should stress that the conditions imposed for the equivalence between nominal and fiscal devaluation, namely the passthrough of value added and payroll taxes, and the denomination of assets are extremely strong. And if they fail it is very difficult to have a fiscal devaluation that replicates the nominal devaluation.

In addition we want to stress that it is not clear that the advantages usually advanced for the use of the exchange rate as a stabilization policy instrument are the ones that can be obtained from the policy described in this article. As we said the potential need for a exchange rate comes here associated to a “disequilibrium” which calls for a permanent adjustment. In this sense if the exchange rate was the effective and efficient policy instrument the desirable policy would be a large devaluation. The literature uses exchange rate policy as a response to small, cyclical and short lived shocks, to which price and wage setting does not have an incentive to react. But the question under review result from permanent and of significative magnitude shocks. In this case we have to discuss in a very different way the type of distortions characterizing the economy which policy makers want to minimize through a devaluation, nominal or fiscal.
References


