Interest Rate Effects of a Discriminatory Levy of a Withholding Tax: a Pedagogic Note

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In deze tekst passen we het textboek IS-LM-BB-model aan voor de situatie waarin de roerende voorheffing op een discriminerende wijze wordt geheven nl. enkel op interesten betaald aan ingezetenen. Deze heffingswijze heeft tot gevolg dat het rente-effect van de belasting enkel kan worden afgeleid na het opsplitten van de kapitaalbewegingen in deze van binnen- en van buitenlandse beleggers. Domineren b.v. buitenlandse beleggers in deze kapitaalbewegingen de binnenlandse, dan zal het rente-effect beperkt zijn. Beleidsmatig volgt hieruit dat de rentegevolgen van de roerende voorheffing kunnen worden beperkt door een verbetering van de internationale aantrekkelijkheid van beleggingen in Belgische frank.

1. Introduction

One feature of taxes is that they are not necessarily borne by those who pay them. This is expressed in the proposition that, in a competitive market, it does not matter whether the tax is levied on the buyer or on the seller. Since the withholding tax is not different from any other tax, one cannot deduct from the legal stipulation that the tax is imposed on interest income, that the investor is bearing the burden: the rise in market interest rates will offset, partly or completely, the effect of the tax on the net rate. Borrowers and, more generally, all economic agents, will bear the consequences of higher interest rates through the decline in investment and the rise in unemployment.

An analysis of the effects of the withholding tax on interest rates does, however, create an additional difficulty compared to an ordinary tax since the tax is generally, levied in a discriminatory way by the exemption of
foreign investors. In this paper we adapt the well known IS-LM-BB-model to this situation. We show that when capital movements reflect mainly the behavior of foreign investors, the domestic gross interest rate will tend to be equalized with the foreign one through the flow of financial assets. On the other hand, when capital movements reflect mainly the behavior of domestic investors, it is the net after tax interest rate that will tend to be equalized: market interest rates will increase so as to offset the effect of the withholding tax. The implication is that no general conclusion with respect to the effect of a withholding tax on interest rates can be derived when this tax is levied in a discriminatory way.

2. The IS-LM-BB-Model and the Withholding Tax

Although the applicability of the IS-LM-BB-model is limited, it is widely used in macro-economic textbooks for its pedagogic convenience. We feel that its drawbacks (for instance, the "flow" approach) are not fundamental to our analysis. One main advantage of this approach, however, is that it allows a simple integration of the real, monetary and foreign sector.

In the next figure we illustrate how the introduction of a withholding tax can affect the interest rate in the IS-LM-BB-model. Assume that the initial equilibrium point is $E_0$. When a tax is imposed on income from financial assets, the BB-curve will shift upwards to $BB_1$ because capital movements respond to the net after tax interest rate; for a similar reason the LM-curve also shifts upwards (to $LM_1$). If the tax is budgetary neutral, the IS-curve will not shift.

When $LM_1$ does not intersect the IS-curve in the same point as the BB-curve, further adjustments will occur. If we assume, for instance, fixed exchange rates (the exchange rate regime and expected exchange rate changes are not crucial to our analysis), the balance of payment surplus or deficit will lead to additional shifts in the LM-curve so that a final equilibrium will be reached where the three-curveds intersect in the same point, $E_1$ in figure 1.

This analysis seems to be quite straightforward: the effect on the interest rate depends essentially on the gross interest rate elasticity of the IS-curve and the net interest rate elasticity of the BB-curve. This result, however,
only holds when the withholding tax is imposed on all investors. When, for instance, foreign investors are exempted, the composition of the international capital flows becomes crucial to the analysis. This is illustrated below.

**FIGURE 1**
A Withholding Tax in a IS-LM-BB-Model

3. The Withholding Tax and the BB-Curve

In the next graph we derive the BB-curve. In the upper left part the net capital outflow curve (NFI) is shown. This curve is drawn for a fixed foreign interest rate and is, of course, negatively sloped. In the lower right part of the graph the relation between the net export of goods and services (the current account) and the income level is illustrated. A higher income reduces net exports. The BB-curve represents all interest rate-income combinations that are compatible with an equilibrium on the balance of payments. Although this equilibrium can be defined arbitrarily, we use an equality between capital outflows and the surplus on the current account. This is imposed in the lower left hand side of the graph.

The important point to note here is the relationship between the interest

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rate elasticity of the net capital outflow curve and the BB-curve. A higher interest rate elasticity of the NFI-curve, is associated with a higher elasticity of the BB-curve. This means, ceteris paribus, that the composition of the international capital flows will influence the position and shape of the BB-line.

We are now able to show how the net outflow of capital curve and thus indirectly, the BB-curve, is affected by a discriminatory levy of the withholding tax. We assume, as is traditionally the case, that foreign investors are exempted from this tax. As a result, capital movements need to be decomposed since the gross interest rate is relevant for foreign investors while the net of the withholding tax interest rate is the relevant one for domestic investors.

The left hand part of figure 3 illustrates the relationship between the domestic interest rate and the net capital outflow of foreign investors; this is the F-curve. The middle part of figure 3 illustrates this curve for domestic investors; this is the D-curve. The right hand part is the sum of both components the NFI-curve. These curves are drawn for a given foreign interest rate. We assume, for reasons of simplicity, that initially both curves have the same intercept (i₀); it can also be assumed that the domestic interest rate equals the foreign one. If initially no withholding tax exists, the total net capital outflow curve will intersect the ordinate at the initial domestic interest rate.

**FIGURE 2**

*The BB-Curve*
where \( i \) : interest rate
NFI : net capital outflow
NE : net exports of goods and services
Y : income.

**FIGURE 3**
The Decomposition of the Net Capital Outflow Curve

where \( D \) : net capital outflow curve of domestic investors.
\( F \) : net capital outflow curve of foreign investors.

Assume now that a withholding tax (t) is imposed. The F-curve will not shift since foreign investors are assumed to be exempted from the tax (of course things can be different when some administrative work has to be performed to get the exemption of the tax). On the other hand, the capital outflow curve of domestic investors will shift upwards to \( D' \). Since the withholding tax is a fixed percentage of the interest rate, the difference between both curves depends on the level of the interest rate.

As a result of the shift of the D-curve, the NFI-curve shifts to NFI'. This curve is the sum of the "old" F-curve and the "new" D-curve (\( D' \)). As a result of this upward shift of the NFI-curve the domestic gross interest rate will have to rise (to \( i_1 \)) in order to maintain an equilibrium on the balance of payments. The magnitude of this increase depends on the composition of the capital account. To clarify this, we decompose the interest rate elasticity of the total capital movements in a domestic and a foreign component:

\[
E(N, i) = \frac{D}{N} E(D, i) + \frac{F}{N} E(F, i)
\]
where

\[ E(N, i) : \text{interest rate elasticity of the total capital movements} \]
\[ E(D, i) : \text{interest rate elasticity of the capital movements of} \]
\[ \text{the domestic investors} \]
\[ E(F, i) : \text{interest rate elasticity of the capital movements of} \]
\[ \text{the foreign investors} \]
\[ D : \text{capital movements of domestic investors} \]
\[ F : \text{capital movements of foreign investors} \]
\[ N : \text{total capital movements} \ (=D+F) \]

This expression shows that the properties of the total capital outflow curve depend on the composition of these outflows. A fortiori, this will be true when a withholding tax is introduced. If, to take an extreme case, foreign investors are not investing in domestic financial assets or their demand is completely inelastic, the NFI-curve will be determined by the properties of the D-curve. As a result, the imposition of a withholding tax shifts the BB-curve upwards with the amount of the tax; the final effect on the interest rate depends on the shape of the IS-curve. A prerequisite for a constant net interest rate is, however, met in this case since the upwards shift of the NFI-curve equals the tax \( \left( i_1 = i_0/(1-t) \right) \).

On the other hand, when domestic financial assets are very attractive to foreign investors, the NFI-curve will mainly be determined by the F-curve implying that a discriminatory imposition of the withholding tax will lead to a relatively small shift of the NFI-curve. As a result, the rise in the interest rate will also be small. This explains the presumed effect that the imposition of a tax on interest income results in a lower net interest rate.

The previous analysis also leads to the obvious result that when the F-curve is infinitely elastic, the NFI-curve will not shift as a result of the imposition of the withholding tax; the interest rate will remain constant. However, when the D-curve is infinitely elastic, the market interest rate will increase so as to keep the net rate constant.
In the previous analysis financial institutions were not explicitly considered. Their role can, however, be important in this context since they are also exempted from the withholding tax. This is rationalized by the fact that a payment of the withholding tax by these institutions, given that this tax is also levied on interest paid on deposits, would amount to a double taxation. Furthermore, these intermediaries are subjected to the corporate tax.

The exemption of financial institutions from the withholding tax implies that they could perform, in principle, a similar role as foreign investors i.e. limiting the upwards effect on the interest rate. However, one can question whether this effect can be large enough to affect the interest rate since financial institutions do not keep an open position so that their net capital movements, over some time period, are relatively small.

4. Policy Implications for Belgium and Conclusions

The introduction of a withholding tax in the simple traditional macro-economic IS-LM-BB-model allows one to analyse an important feature of this tax. Frequently, it is levied in a discriminatory way i.e. foreign investors are exempted from the tax. The analysis can, however, be modified easily to take other differential tax treatments into account.

The discriminatory feature of the tax is especially important for small open economies. There, one frequently asserts that the domestic interest rate is determined on the international financial market. Since it concerns a gross interest rate, this would imply that a withholding tax lowers the net interest rate. Since this is the presumed effect of the withholding tax, arguments in favor of a reduction or abolition need therefore, in this case, to rely on the economic and financial effects of capital outflows.

The analysis developed in the previous pages shows that such a statement depends crucially on the (implicit) assumption that foreign investors dominate domestic ones. This will only be observed, however, when the small economy has an internationally very attractive currency. For most small economies this is not the case so that the net and not the gross domestic interest rate will tend to be equalized to the foreign one: the withholding tax will then be reflected, to a large extent, in the market interest rate.
More realistically, one can argue that money markets are more integrated than capital markets. Since, furthermore, financial institutions dominate the money market, this will imply a tendency for the gross short term interest rate to be equalized to the foreign one; on the capital market on the other hand, the net interest rate will tend to be equalized. Since both markets are somewhat but not perfectly integrated, one would expect a larger effect of the withholding tax on the bond rate relative to the money market rate.

Several indications support the view that net capital movements in Belgium tend to be dominated by domestic investors:

- Belgian financial institution market financial assets denominated in foreign currencies. No such activity is performed by foreign financial institutions for assets denominated in Belgian francs.
- Although foreign investors are exempted from the withholding tax, this creates frequently practical difficulties: the withholding tax needs to be paid and afterwards claimed back. The effective interest rate will then be lower than the market rate.
- Financial assets attractive to foreign investors such as Treasury bills, cannot be purchased.
- Foreign investors can fear that the market liquidity is systematically low as a result of the small size, relative to their investments, of the secondary markets.

The previous analysis can easily be adapted to changing conditions on the financial markets. One cannot deny that the mobility of capital movements has increased significantly over the past decades, for instance as a result of financial innovations. It is not obvious that the behavior of foreign and domestic investors changed in a similar way. One could argue that the deterioration of Belgian economic conditions repelled foreign investors and incited Belgian investors to buy foreign financial assets.

The main policy implication of these results is that, when the withholding tax is retained, the financial attractiveness of Belgium needs to increase if one wants to limit the upwards effect on interest rates. However, one should then accept, since the net interest rate for Belgian investors will decline, more capital outflows. In the end, a situation could be envisaged were no effect of the withholding tax on the level of the interest rate is observed but were, at the same time, the government does not collect any revenue from
the tax because financial intermediation has been relocated in a foreign country.