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Interview Michiel Muller, CEO of Route Mobiel

[Entrepreneurship]

MPhil Minds: The Taxation Implicit in South Africa's Dual Exchange Rate System

Let's say that you are the minister of finance in one of the world's developing countries. How do you raise (additional) money? You could raise the level of Value Added Taxes (VAT). But, for your country, a VAT system is complicated. You could raise, for example, the income tax level. But, unfortunately for you, much business in your country takes place in the black market. Of course, you could borrow money from abroad or from your own citizens; by giving out government bonds. However, this is costly as you have to pay an interest rate on this. Also, that interest rate will probably be high because you are a developing country. So, again, how do you raise money? What now if I tell you that you can put in place more than just one exchange rate and thereby raise money from your own citizens at a low cost!

By Peter van der Windt

Before continuing let me tell you what a dual exchange rate system (hereafter also DRS) is. As the name suggests, having a DRS means that your country has not one but two exchange rates. More specifically, in this article I will define a dual exchange rate system to be a system where one exchange rate is applied to current account transactions and another exchange rate is used for capital account transactions. The former exchange rate is often fixed and labeled the commercial exchange rate (which I will denote with cj), whereas the latter is often allowed to float and termed the financial (or parallel) exchange rate (which I will denote with ej).

As of 2004, only fourteen countries out of the IMF's 188 members are reported to have more than one exchange rate. Every single one of them is a developing country[1]. Although this number is small, it has only been so since a few years. At the end of 1993, as Kiguel, et al. (1997) point out, over 25% of the then 158 developing country members of the IMF had more than one exchange rate. Although also developed countries had these systems in place, the most severe and persistent dual exchange rate systems were to be found in developing countries. South Africa, the case study in my paper, had a DRS in place between the 1960s until 1995.

Now why have dual exchange rate systems been in place in especially developing countries? In addition, what is the reason that most dual exchange rate systems no longer exist? Finally, what does all of this have to do with you being the minister of finance? In my paper I have a look at these questions by doing three things: playing around with elementary mathematics, having a detailed historic analysis of South Africa and doing some econometric regressions. Each of these three are a separate part of my thesis. In this particular article, by building further on Huizinga (1996), I will first show you that a DRS is equal to a tax on domestic investors who invest their money abroad. Subsequently, I will show you that this makes it possible for a government to raise money from their own citizens at a low cost (i.e., at a low interest rate). Finally, I will illustrate the issue for South Africa.

With one exchange rate

Let me start with a tool that is in wide use in the literature: the uncovered interest parity condition. Let's say that your brother is a South African investor and he wants to invest one South African rand (the currency in South Africa) for one period in a government bond. That is, he invests in period 1 and wants to have everything back in period 2. He can do either one of two things. On the one hand, he could invest in South Africa (SA); his home country. By doing this he will obtain in the second period (1+i) in rands; that is, his investment (which is equal to 1) and the domestic (SA) interest that he obtained on it (equal to i). On the other hand, he could invest in a foreign country, let's say the United States (US). In order to do this he will have to convert his one rand into dollars. After conversion he has 1/e1 dollars that he can invest in say T-bills (the bonds given out by the United States' Treasury). After the second period he has earned (1/e1)(1+i*) in dollars, where i* is the interest rate in the US. Your brother will convert this back into South African rands and then has (e2/e1)(1+i*) in rands. It should be obvious that, without any restrictions, these two investment opportunities should be the same:

$$1+i=\frac{e_2}{e_1}\left(1+i^*\right) \qquad (1)$$

Where the left hand side is what your brother can earn in South Africa and the right hand side is what your brother can earn in the US. They should be equal, because if you can earn more in South Africa (the left hand side is higher than the right hand side) US investors will invest in South Africa driving the interest rate in South Africa down. This equation can be rewritten to obtain:

$$i=i^*+\left(\frac{e_2-e_1}{e_1}\right) \qquad (2)$$

This is the famous equation for uncovered interest rate parity that you see in every undergraduate textbook on international economics. It basically says that the domestic interest rate should equal the foreign interest rate modified for the change in exchange rates.

With two exchange rates

But as I told you, between the 1960s and 1995, South Africa had a dual exchange rate system in place. In figure 1 you can see how these exchange rates looked like and how they behaved. Your brother still wants to invest his one South African rand. Again, on the one hand, he could invest in South Africa. He will then, again, obtain (1+i) in rands at the end of the second period. On the other hand, he could invest in the United States. Again, in the

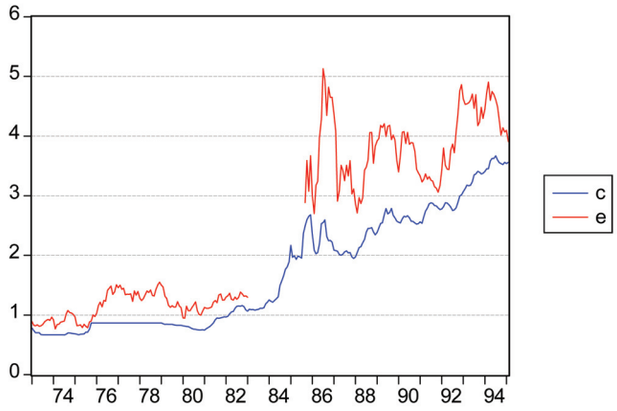

FIGURE 1. Commercial and financial rand exchange rate (R/$)

first period he will have to convert his one rand into dollars. Capital investments go via the capital account (so via the financial exchange rate (ej)) so he will have 1/e1 dollars that he can invest in, let's say again, T-bills. After the second period he then again has earned (1/e1)(1+i*); so nothing new yet. Your brother again wants to convert this back into South African rands. However, now the trick of a DRS comes in. You get your investment back via the capital account, so via the financial rate. However, interest earnings go via the current account, so via the commercial exchange rate (cj). So your brother will get the following when he converts it all back to South African rands: (e2/e1) + (c2/e1)i*. Again, without any restrictions, both investment opportunities should be equal:

(3) $$1+i=\frac{e_2}{e_1}+\frac{c_2}{e_1}i^*$$

where again the
left hand side is what your brother can earn in South Africa and the right hand side what your brother can earn in the US.

Now let us take one step back and think about what a dual exchange rate system actually does. When you are a South African investor you are actually being taxed! That is, a DRS contains an implicit taxation. Think about the following. Under a normal exchange rate you would have received back your interest profit at e2 and not at c2. So you are being taxed at the following amount:

(4) $$\left(\frac{e_2-c_2}{e_2}\right)i^*$$

To give an example, say that c2 is 2 and e2 is 4. Instead of getting your interest back at 4 rands per dollar you get it back at only 2 rands per dollar, which is not good for you because you hold dollars that you want to convert to rands. So, using equation (4), you only get half (0.5) of what you should have received under a system with one exchange rate. This taxation, equation (4), is positive when the commercial exchange rate is appreciated with regard to the financial exchange rate (, so when cj<ej). As you can see from figure 1, this has always been the case for South Africa (and, in 99% of all cases, also for all the other countries that have had a DRS).

The interesting part now kicks in: Equation (3), which is the arbitrage relationship for a resident investor when a DRS is in place, can be rewritten to obtain:

(5) $$i=i^*+\left(\frac{e_2-e_1}{e_1}\right)-\left(\frac{e_2-c_2}{e_2}\right)i^*$$

, which is again the uncovered interest parity (equation (2)), but now there is, in contrast to a unified exchange rate system, an additional term. This additional term is exactly the taxation that is present in a dual exchange rate system (equation 4).

Now why did I go through all this trouble to show you this and why do I say that this is interesting? It follows from equation (5) that with a dual exchange rate system the domestic (South African) interest rate is lower than under a normal exchange rate system! As I told you the third term on the right hand side of equation (5) is positive, thereby decreasing the left hand side: the domestic (South African) interest rate! Remember that you are the minister of finance and you wanted to raise money. Here is your magic potion: with a DRS it is now possible to borrow (give out bonds) at a lower costs because your domestic interest rate is lower. That is, you simply put in place a second exchange rate and thereby raise money from your own citizens more cheaply!

South Africa.

Although the above sounds like your magic potion, does it make sense in reality? In order to answer this question I illustrated the above story with South Africa. For this I did two things. First, I delved deep in the history of South Africa's experience with (dual) exchange rate systems. In very brief, over the period under discussion (1960s – 1995) South Africa had five different exchange rate regimes in place, of which only one was a dual exchange rate system as I defined above and where the Central Bank could intervene in the financial (parallel) exchange market. This period was the securities rand system (1976:02 – 1979:01). Second, I did some econometric regressions. Together these two parts form the most important part of my thesis. However, because I do not want to bother you with the details and because of the limited amount of space, I will only (very) briefly show you the main results of the third part in my thesis; the empirical part[2].

Now did the taxation implicit in a DRS really have a negative effect on the South African interest rate (this is a crucial point in my MPhil-thesis)? To answer this question I did some regressions on data that I obtained from the South African Reserve Bank. I estimated a (substantially) rewritten version of equation (5), controlling for many potential econometric pitfalls, and I included dummies for each of the different exchange rate periods that have been in place in South Africa. In brief, the results are as follows. The third term on the right hand side of equation (5) has the expected sign (i.e., negative). That is, the taxation implicit in a DRS indeed leads

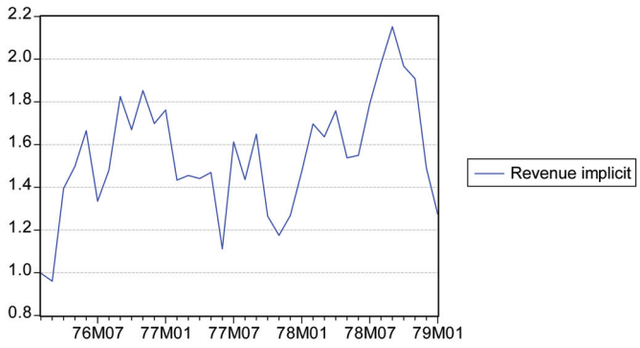

FIGURE 2. SA government's debt-service savings (% of GDP)

to a lower South African interest rate. Importantly, the coefficient is significant during the securities rand period (when a DRS was in place), and only during this period! More specifically, during the periods were no dual exchange rate system was present the coefficients of the third term on the right-hand side of equation (5) was not significant. These are fantastic results and it means that a DRS really leads to a lower domestic (South African) interest rate!

So we now know that a dual exchange rate system does not only lead to a lower interest rate theoretically; it holds also true in real life. Now the final question of course is: how much did the South African government actually benefit from it? This is actually very simple to calculate. The South African government had to pay a lower interest rate than otherwise would have been necessary by an amount equal to equation (4); which is the implicit taxation or the government debt yield differential. If you multiply this by the total stock of government debt of South Africa (net of any government debt held by monetary authorities) you obtain the debt-service savings; put differently, what South Africa gained by having a DRS. I represented the latter, as a percentage of GDP, in figure 2. The figure indicates that the financial implications of a dual exchange rate system can be substantial. More specifically, the computed gain for the South African government can reach a high of 2.15 percent of GDP in September 1978. On average, over the securities rand period, the debt-service savings amounted to 1.46 percent of GDP.

Conclusion

If you are the minister of finance in a developing country and you want to raise (additional) money, a DRS seems fantastic. Doesn't it?! A dual exchange rate system makes it possible for a government to (substantially) decrease its domestic interest rate. In addition, we calculated that the overall debt-service savings from this lower domestic rate can be substantial. Basically, with a DRS you can raise money from your own citizens at a low cost, without paying anything for it yourself! Fantastic, or not?

Unfortunately, not. In the second part of my MPhil-thesis, where I discuss South Africa's historic experience with exchange rate systems, I do not only discuss how the various (dual) exchange rate systems operated. In that part I also showed, in detail, that the DRS led to many perverse unanticipated effects for South Africa. Severely limiting capital inflows was one of them. Also, I showed that a DRS can only survive when capital controls are put in place; which has its own potential perverse unanticipated effects. In addition, a DRS is relatively nontransparent, as the implicit tax rate has to be calculated from exchange rate data. Also, taxing capital income through the exchange rate system further introduces undesirable uncertainty to the extent that the exchange rates are variable. Finally, the link between administrative exchange rates and capital controls and taxation also may give rise to opportunities for favoritism and abuse. These arguments make dual exchange rate systems very unattractive; even for a developing country. As a result, by means of this paper, I have not only showed why dual exchange rate systems have been in place in especially developing countries and what all of this has to do with you being the minister of finance; by means of this paper I have also given a solid reason for the recent trend in exchange rate liberalization and unification.

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References

Huizinga, Harry P. 1996. The Taxation Implicit in Two-tiered Exchange Rate Systems. International Monetary Fund Working Paper, No. 96/120, November.

International Monetary Fund. 2004. Annual Report on Exchange Arrangements and Exchange Restrictions 2004. Washington, DC: International Monetary Fund.

Kiguel, Miguel A., J. Saul Lizondo and Stephen A. O'Connell. 1997. Parallel Exchange Rates in Developing Countries. New York: St. Martin's press, Inc.

Schaling, Eric. 2005. Capital Controls, Two-tiered Exchange Rate Systems and Exchange Rate Policy: the South African Experience. CentER Discussion Paper, No. 110/2005, August.

1. These countries are: the Bahamas, Belize, Botswana, Cambodia, Eritrea, Guinea, Myanmar, Sierra Leone, Somalia, Turkmenistan, Zimbabwe, Nigeria, Suriname and the Syrian Arab Republic. The first eleven have dual exchange rate systems and the latter three have multiple exchange rates. See the IMF (2004), pp. 12-18.

2. Actually the story is substantially more complicated for South Africa than told here. First, South Africa had capital controls in place on South African resident and as a result equation (3), and therefore equation (5), did not hold. However, a similar equation for a nonresident (e.g. US) investor did hold. As a result, instead of a taxation implicit there then exists a subsidy implicit in the DRS. Take note that this does not change the results, because a subsidy is nothing more than a negative tax. Second, actually the blocked rand system (1960s – 1976:02) was also a DRS as I defined above. However, I show, by building on Schaling (2005), that during this period the South African government was not allowed to intervene in the parallel market because of, indirectly, the IMF. Again, I left these interesting discussions out to limit space. The results do not change.