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Are the Conditions for Ricardian Equivalence Theorem Likely to Hold in Developing Countries?

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Some countries suffer budget deficit problems. Such countries sell bonds or create money to finance their budget deficits. Ricardian Equivalence Theorem (RET) suggests that budget deficits should be financed by selling bonds because this is only postponement of taxes. This article tries to examine whether the RET holds in developing countries or not. RET has many assumptions. These assumptions will be analysed for developing countries.

1. Introduction

In recent years, many countries have experienced fiscal deficits. If government spending is not financed by current taxes, there will be budget deficit. Deficit can be financed either by selling bonds or by printing money. If budget deficits are financed by printing money, inflation might rise. According to the Ricardian Equivalence Theorem (RET), If a budget deficit is financed by selling bonds, there will be no impact on aggregate demand in the economy. RET suggests that budget deficits can be financed by selling bonds because this is only postponement taxes. RET was first introduced by the British Economist David Ricardo in the nineteenth century, and recently, has been given a forceful restatement by Robert Barro of Harvard.

This paper seeks to examine whether the RET holds in developing countries or not. Firstly, the RET will be explained briefly, thereafter its assumptions will be analysed for developing countries.

2. Ricardian Equivalence Theorem

Let the budget constraint of the private sector be as in equation (1):

$$C_1 + \frac{C_2}{(1+r)} = Y_1 + \frac{Y_2}{(1+r)} - T_1 + \frac{T_2}{(1+r)} \quad (1)$$

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In equation (1), C_1 is the private sector's present consumption expenditure, $C_2/(1+r)$ is the private sector's next year discounted consumption expenditure for next year, $Y_1+Y_2/(1+r)$ is gross discounted income, and $T_1+T_2/(1+r)$ is discounted tax liabilities.

200 It can be seen that lifetime consumption equals discounted present value of income minus discounted present value of taxes. Due date of taxes does not matter for the individuals budget constraint as long as discounted present value of taxes remains unchanged.

If present taxes (T_1) are cut in the amount of DT , future taxes (T_2) are raised by $(1+r) DT$:

$$\Delta T_1 + \frac{\Delta T_2}{(1+r)} = -\Delta T + (1+r) \frac{\Delta T}{(1+r)} = 0 \quad (2)$$

In equation (2), it is assumed that government cuts T_1 by DT without any change in its total expenditure. For this reason, public debt will rise by the amount of the tax cut. Future taxes have to be increased $(1+r) DT$ by more than the tax cut because the government has to pay the interest on its borrowing.

The tax cut does not affect individuals' permanent income because future taxes will increase to compensate for the present tax decrease. Therefore, despite the cut in present taxes and the rise in present disposable income, individuals will not change their present levels of consumption (C_1). Eventually, individuals save the income that they receive from the tax cut to pay for the future tax increase. Government should raise future taxes by more than the tax cut because they must pay the interest on its borrowing. When tax is cut, individuals' savings increase by the amount of the tax decrease, but government revenues decrease by the amount of the tax decrease. Eventually, national savings remain unaffected by the tax cut, because the fall in government saving equals the rise in individuals' savings. Barro claims that "the tax cut during period 1 provides enough resources, but no more, for households to pay the higher taxes in the next period" (Barro, 1990: 350-351). Therefore, a tax cut does not affect wealth, consumer demand and work effort.

RET has extremely unrealistic assumptions. These are mainly; infinite life horizon, perfect capital market, lump-sum taxes (non-distortionary taxes), and certainty about future taxes. Now, I shall try to explain that these assumptions are invalid for developing economies.

3. Finite Horizon

RET assumes that individuals alive today care about the taxes which will be paid by their children. Therefore, individuals want to leave their savings for their children to help then pay the government debt in the future. Moreover, individuals have finite

lives, they behave as if they were infinitely lived. Individuals who are receiving the tax cut today will not be paying off the debt tomorrow but next generations will pay this tax. Furthermore, individuals alive today are concerned about the taxes that they pay, but not about the increase in future government debt that will require taxes on the future generations. Therefore, a tax cut leads to a rise in consumption and a fall in national savings because the private sector could not rise fully to offset for the fall in government saving.

Stevenson and others have claimed that "the present generation takes into account the utility of its children, and therefore an expected tax liability on the children will induce the present generation to increase its bequest accordingly, thus saving more and consuming less"(Stevenson and others, 1988: 199). For this reason, wealth effect of the bonds is invalidated. Furthermore, most of the households might be far-sighted as to take into account their children's expected tax liabilities.

RET assumes that the government and individuals have the same planning horizon. In fact, individuals do not live forever and therefore do not care about taxes that are applied after their death. Furthermore, the government has an infinite life period because of being deathless, but individuals have a finite life period.

RET assumes that individuals behave as if they will live forever because they are linked to next generations through a chain of bequest. As long as the present generations are linked to all future generations by a chain of operative intergenerational transfer neither in the path from old people to young people nor in the path from young people to old people, changes in government debt do not influence consumption plans and aggregate demand. They want to leave more bequest to their children. A tax cut increases their bequest and correspondingly increases the tax on their children. Eventually, individuals save the whole tax reduction. Therefore, debt does not affect aggregate demand because the government borrowing equals to individuals' increased saving. In this case, it is assumed that individuals can fore-see and also, they are rational. Mohanty claimed that "individuals are extremely myopic in their consumption decisions and tend to ignore the future tax burden implied by the government deficit" (Mohanty, 1993: 136). In fact, in developing countries, most of the individuals are not rational and they can not fore-see in developing countries. In developing countries, the majority of the people can not leave significant bequest to their children. Moreover, RET assumes that intergenerational transfers are altruistically motivated to leave more bequest to next generations. However, most of the individuals might not behave altruismly in developing countries. It assumes that there is a strong link between generations but, in developing countries, there is a weak link between generations. Moreover, RET ignores childless families. It does not hold childless families because such families do not leave their bequest to anybody and do not behave altruismly. Under these circumstances, RET does not hold in developing countries.

4. Imperfect Markets

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RET assumes that capital markets are perfect and that there are no limitations on borrowing or lending. Furthermore, it assumes that private and government interest rates are the same. In other words, discount rate is equal to the interest paid by the government on its bonds. In reality, the discount rate for the private sector is likely to be higher than the interest rate for the government sector, because there is no risk in government bonds and also income from government bonds is not taxed in many developing countries. For example, in Turkey, income from government bonds is exempt from any form of tax. Furthermore, in developing countries, individuals prefer to spend more now, based on their future wealth, but they cannot borrow against future income because of imperfections in the financial markets. Mohanty stated that "in case of developing countries where capital markets are highly imperfect and government borrowing rate widely differs from the private rate" (Mohanty, 1993: 75). It can be said that RET fails in developing countries because of imperfect markets.

5. Distortionary Taxes

According to RET, the future taxes are lump-sum and non-distortinary. In developing countries, these taxes may apply to personal income, consumption and/or corporate income. Changes in income taxes and corporate income taxes can affect production, consumption, and distribution of income. Most taxes have distortion effects in the economy. Even lump-sum taxes have a distortion effect in the economy. There is another fallacy about lump-sum tax in developing economies. There is common tax avoidance in lump-sum taxes. Therefore, anticipated future taxes on wealth can discourage current saving and also increase current consumption. Under these circumstances, RET does not hold in developing economies.

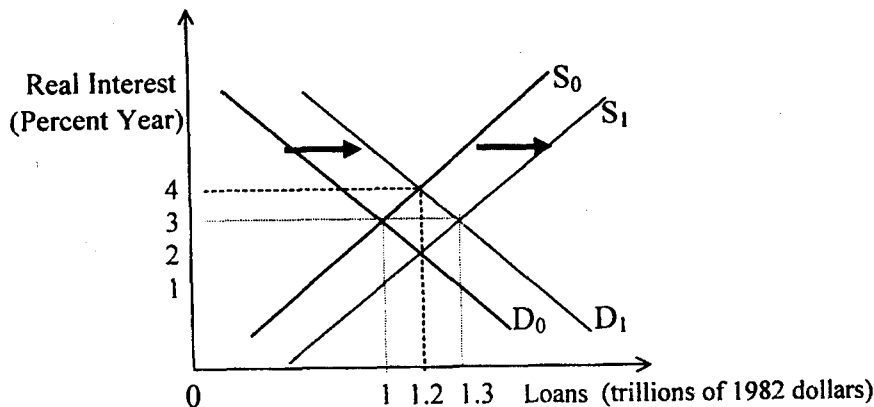
6. Uncertainty

RET assumes that individuals are rational and can fore-see the future certainty. However, there is uncertainty about individuals' incomes, taxes and amount of bequests in the future. RET has ignored uncertainty. Bernheim stated that "future taxes may also be uncertain because they are related to income, which is itself random" (Bernheim, 1987: 271). Therefore, there will be a difference between an additional income in the present, because of tax cut, and a future payment to individuals' children that has a present value of taxes. Especially, in developing economies, there are significant uncertainties and risks in the future because of economic problems such as inflation and unemployment. It can thus be said that, RET does not hold in developing economies because of uncertainty and risk about in the future.

7. Other Fallacy of Assumptions

One of the Ricardian assumptions is that the government obtains no revenue from creation of money because aggregate money stock is fixed. Therefore, price levels and nominal interest rates are constant. Furthermore, the real interest rate equals the nominal rate because there is no inflation. In many developing countries, there is high inflation and therefore there is a difference between real interest rate and nominal rate. For this reason, this assumption is unrealistic in developing economies. **203**

Figure 1



Source: Parkin, M. (1990), *Macroeconomics*: 442

In figure 1, the horizontal axis is loans as trillions of 1982 dollars in USA, and the vertical axis is real interest rate as percent. In the figure, D_0 is initially the demand for loans and S_0 is the supply of loans. The quantity of loans outstanding is \$ 1 trillion and the real interest rate is 3 per cent. When the government borrows, the demand curve for loans shifts to the right to D_1 . At the same time, according to RET, there is a cut in consumption and increase in the supply of loans. For this reason, the supply curve shifts to the right to S_1 . The quantity of loans increases from \$1 trillion to \$1.3 trillion and the real interest rate remains constant at 3 per cent. Eventually, there is no crowding-out of investment because the real interest is constant. In fact, when the government borrows, the demand curve for loans shifts to the right to D_1 , but at the same time, there is not any change the supply of loans because of increase in individuals' consumption. As a result, the quantity of loans increases from \$ 1trillion to \$ 1.2 trillion and real interest rate increases from 3 per cent to 4 per cent. For this reason, in reality, government borrowing leads to crowding-out of investment. Bernheim claims that deficits raise interest rates because of two reasons.

"First, if deficits depress saving, then interest rates must rise to bring saving and investment back into balance. Second, if deficit stimulate aggregate demand, then the transactions demand for money may rise" (Bernheim, 1987: 285). Under these circumstances, Ricardian Equivalence fails.

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The cut in taxes increases individuals' consumption and also decreases national savings. This depends on marginal propensity to consume or save. RET assumes that the marginal propensity to consume out of disposable income is zero and the marginal propensity to save is one. In other words, a tax cut increases individuals' disposable income, and they put all of their extra of disposable income into bonds because their marginal propensity to save is one. In reality, this case is impossible. In developing countries, marginal propensity to consume is higher than marginal propensity to save. Therefore, this assumption is unrealistic for a developing economy.

Seater stated that "Ricardian Equivalence implies that an increase in social security benefits should lead to an increase in bequeathable assets because social security is a transfer from the young to the old that the old will want to undo by transferring back to the young" (Seater, 1993: 179). In developing countries, transfer payments are very common government expenditure. Transfer payment is a reduction in taxes. According to the RET, an increase in transfer payments does not affect current consumption. Transfer payments are made from the government to poor people. The marginal propensity to consume, of poor people, is higher than marginal propensity to save. For this reason, transfer payments increase current consumption. In this case, RET fails in developing countries.

RET assumes that a tax cut leads to a change in the government deficits. Therefore, it has no effect on aggregate demand. Feldstein argues that "even if the pre-Ricardian proposition were true, changes in government deficit that result from changes in government spending could affect aggregate demand" (Feldstein, 1982: 2-3). In fact, RET fails because government spending affects aggregate demand. According to Keynesian view, deficits have an effect on the real economy because of under-employment. If there is under-employment in a economy, deficits increase aggregate demand because of the multiplier effect. RET assumes that there is always full-employment in the economy, and therefore deficit does not affect aggregate demand. In reality, in developing economies, there is always under-employment. For this reason, this assumption is invalid for developing economies.

In general, developing countries have a high inflation. Inflation in these countries leads to reduction in private saving because individuals have to pay more money for their consumption. Dornbusch and Fischer claim that "many people cannot borrow, and thus do not consume according to their permanent income. They would like to consume more today but because of liquidity constraints -their inability to borrow- are constrained to consuming less than they would want according to their

permanent income" (Dornbusch and Fischer, 1994: 588). Therefore, a tax cut increases individuals' consumption. Under these circumstances, RET fails in developing countries.

8. Conclusion

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It can be concluded that RET does not hold in developing economies because it has a number of unrealistic assumptions. First of all, households do not live forever and therefore do not care about taxes that are levied after their death. Secondly, capital markets are imperfect and the discount rate for the private sector is higher than the interest rate for the government sector in developing economies. Thirdly, taxes are not lump-sum, because they depend on income, spending and wealth. Moreover, taxes have distortionary effect on the economy in developing countries. Lastly, future taxes and incomes are uncertain in developing economies. Under these circumstances, RET does not hold in developing countries.

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