

Public and Private Net Savings in Developing Countries: Some Empirical Tests for the Period 1972-88

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1. INTRODUCTION

The severe shocks that rocked the world economy in the 1970s and the ensuing efforts to adjust and to renew economic growth have had a profound effect on the economic literature. Especially the external and public debt problems which reached critical dimensions in many countries attracted much attention. Thus, in the field of macroeconomics financial issues have gained more prominence over the last two decades. Studies relating to the fiscal deficit have been particularly numerous. The critical size of national public debts, the contribution of the public debt to external debt, the reduced confidence in the state as the guide in socioeconomic development and the role of fiscal policy in adjustment processes are among the main reasons for this increased interest.

What the theoretical studies in this field have shown above all is that the relations between public finance and the rest of the economy are highly complex. Many aspects have to be considered, often simultaneously. A few examples will help to illustrate the dimensions of the problem.¹ First there is of course the nature of the fiscal deficit that must be considered. In this connection such questions arise as How has the deficit been caused: by the private sector or by the public sector, and in the latter case: due to a change in taxes or to a change in spending and in the latter case: spending on consumption or investment? And, further, How has the deficit been financed: by money or by bond issue, and in the latter case: to domestic or foreign creditors? Secondly there are the aspects relating to the structure of the economy, such as the degree of capacity utilisation, the flexibility of domestic prices and the exchange rate, the openness of the economy to international capital and commodity markets and the level of development of domestic financial

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¹For a more extensive discussion, see Söderström (1987).

markets. And thirdly there is a whole array of behavioural assumptions regarding, e.g. the effect of investment on imports, of taxes (and public debt) on private consumption, of public investment on private investment, of fiscal policy on capital imports and exports and of commodity imports and exports on public revenue. It stands to reason that with such a rich menu of alternative formulations models can be constructed to explain almost any effect of fiscal deficits on main economic variables as economic growth, inflation and the current account of the balance of payments.²

In such a situation empirical tests can be useful by shedding light on the relative importance of various assumptions in the real world. Now that a reasonably long time period has passed since the first oil crisis, such studies can be expected to be more reliable than they could be earlier. There are, however, two complications in this connection. One is that, in view of the multitude of relevant aspects to be considered, one can hardly expect to find a single pattern that captures the experiences of all countries, or even of a large group of countries. The other has to do with the problem studied. After a large-scale crisis countries have to adapt, so behavioural relations are likely to alter in the course of time with obvious consequences for the stability of these relations.

The present paper presents the preliminary results of an empirical exercise examining the relation between the savings balances of the private and public sectors in developing countries. An attempt has been made to take into account the above observations made in the foregoing paragraphs by including data relating to a wide variety of countries and spanning almost two decades.

2. ABOUT THE RELATION TESTED

In recent years much attention has been given to the relation between the public deficit and the balance of payments. A few selected theories will now be discussed briefly in order to illustrate the variation in the outcomes they suggest. The following expression will serve as a reference:

$$(E - M) = a + b(Sg - Ig), \quad \dots \quad \dots \quad \dots \quad \dots \quad (2.1)$$

where E and M represent total revenues and total expenditures in the current account respectively and Sg and Ig represent public savings and public investment.

In the fiscal approach to the balance of payments – as advocated by the new Cambridge school – it is assumed that the demand for financial assets by the private sector is a phase in the adjustment towards stock equilibrium. In other words, there

²It is understandable that a complete survey of models is not available. A selection of relevant models is presented in Frenkel and Razin (1987).

is a limit to that sector's willingness to absorb bonds issued by the public sector which means that the public deficit must ultimately be financed by foreign capital. Over time, therefore, the public deficit is expected to equal the deficit on the current account. According to this reasoning external events, domestic costs and exchange rate movements are of little relevance to the current account. In terms of (2.1) it predicts a to be close to zero and b to be close to one.

In the well-known Mundell-Fleming model with its Keynesian setting of fixed prices and excess capacity the effect of a fiscal expansion depends on the exchange-rate regime. With flexible rates fiscal expansion induces an appreciation which reduces exports and raises imports. As a result income remains unaffected and the public budget and the current account deteriorate by the same magnitude. So, while the analysis differs, the result here is largely the same as in the fiscal approach in the sense that also here b is expected to be equal to one. However, when the exchange rate is fixed exports remain unaffected while income rises and imports follow, so the budget deteriorates more than the current account. In this variant b is positive, but less than one.

In the intertemporal approach the Ricardian equivalence hypothesis is often assumed to hold. Thus, the private sector is assumed to regard public debt as postponed taxes such that a rise in the public deficit generates a rise in private savings in anticipation of a future tax rise. It follows that in this straightforward variant coefficient b is expected to be zero.

The above-mentioned theoretical approaches predicted b to be zero or positive, but not larger than one. But it is easy to picture situations which result in $b > 1$. Take for example the case where both public and private income depend strongly and directly on export revenues, as in oil-exporting countries, while expenditures remain largely unaffected. In such a case a rise in export revenues will boost net savings in the private as well as in the public sector, so b will be greater than one.³

After this brief excursion into macroeconomic theory account must now be taken of the fact that the present tests relate to developing countries. Obviously, characteristics of this group of countries should be included in the analysis. One such characteristic is the difficulty which most developing countries have in attracting foreign capital. So, where the above-mentioned theories assumed perfect capital mobility, their applicability to developing countries is limited. If capital imports are constrained, an exogenous increase in the real public savings deficit cannot spill over fully into the deficit on the current account and, as a consequence, the adaptation must consist of an increased surplus on the private savings balance. Under such conditions one expects to find a one-on-one trade-off between public and private deficit.

³Note that in this case $(I_g - S_g)$ is a dependent variable.

In principle, under constrained capital imports the same outcome can result when the private sector's savings balance deteriorates and the public sector compensates in reaction. But in the real world this is not a very likely situation when funds are in short supply. Under these circumstances governments tend to create a privileged position for themselves in financial markets, such that they are in a better position to carry out their expenditure plans than agents in the private sector. Moreover, monetary financing and seignorage revenues add to the advantage which the public sector has in this respect over the private sector.

In order to express the relation between public and private net savings under constrained capital mobility (2.1) can be rewritten by substitution into identity

$$(E - M) = (Sp - Ip) + (Sg - Ig) \text{ to get} \quad \dots \quad \dots \quad \dots \quad (2.2)$$

$$(Sp - Ip) = a + c (Sg - Ig), \quad \dots \quad \dots \quad \dots \quad (2.3)$$

where $c = (b - 1)$ and index p relates to the private sector. Equation (2.3) is the focus of attention in this paper. In order to allow comparison with outcomes presented elsewhere a standardised version of (2.3) has also been tested:

$$(Sp - Ip) / Y = d + f(Sg - Ig) / Y. \quad \dots \quad \dots \quad \dots \quad (2.4)$$

3. THE DATA USED

Even though this paper is concerned with only the most common macroeconomic variables the data used here require some explanation. This is not because a special interpretation of these variables has been adopted here,⁴ but because some simple operations had to be applied in order to arrive at the data used in the tests.

The data relating to the public sector have been obtained from the entry "Over-all Deficit/Surplus" in I.M.F.'s Government Finance Statistics Yearbook 1990 – supplemented where necessary by volumes from other years. This deficit/surplus is defined as (tax revenue + nontax revenue + grants + capital revenue) – (current expenditure + capital expenditure + total lending minus repayments). The public sector should be interpreted here as "consolidated central government". The balance on the current account has been obtained from I.M.F.'s International Finance Statistics Yearbook 1990.

The private sector's savings balance has been computed as the difference

⁴Yet there are strong arguments in favour of a non-traditional interpretation. For example the public deficit by itself is not always a relevant variable if there are institutions outside the public sector also involved in operations like taxing and subsidising. See World Development Report, [The World Bank (1988), p. 66].

between the balance on the current account and the public sector's savings balance. The problem here is that the former is given in dollars and the latter in domestic currency and that the current official exchange rate is an inadequate instrument for conversion. Not only can the official rate not be expected to have reflected adequately the value of foreign exchange in many developing countries, it has been adjusted in the past by bounds and leaps and these create very large statistical distortions when deriving the figures for the private sector's savings balance.

In order to avoid this problem the net savings by the public sector in consecutive years have first been expressed for each country in the sample in constant prices of 1985 with the GDP deflator – the GNP deflator for Turkey and the Philippines – again using the I.F.S. Yearbook of 1986 and 1990. Values thus obtained have been converted into dollars with the 1985 exchange rates. Figures for the current account balances – which are given in current dollar values – have been expressed in dollars of 1985 with the United States GNP deflator. Hence, the computed savings balances for the private sector are also expressed in dollars of 1985.

Further, for the standardised version of (2.3) data are required relating to the gross national product. The values for this variable have also been taken from the I.F.S. Yearbook. They have been converted into dollars of 1985 in the same way as described above for the net savings of the public sector.

Time series of acceptable length, i.e. running from 1972-73 to 1987-88, could be obtained for 25 developing countries of which seven are situated in Africa, eleven in Asia and seven in Latin America. The countries concerned are listed in the Table 1.

4. EMPIRICAL RESULTS

The balance on the current account can also be viewed as the change in net foreign assets and, similarly, the savings balances of the private and public sectors can be interpreted as the changes in these sectors' net asset positions. Identity (2.2) connects these variables. Therefore, the figures collected can provide some insight into the question whether, for the countries included in the sample, the public or the private sector contributed most to the accumulation of foreign debt over the period considered here.

It appears that in 13 of the 25 countries investigated the public sector accumulated between 1972-73 and 1987-88 considerable negative savings balances, while the private sector showed non-negative balances over this period as a whole. These countries are Egypt, Ghana, Uganda, Zimbabwe, India, Malaysia, Oman, Pakistan, Sri Lanka, Turkey, Brazil, Mexico and El Salvador. In 7 other countries both sectors contributed significantly to foreign debt, *viz.* Kenya, Morocco, Tunisia,

Table 1

The Relation between Public and Private Net Savings between 1972-73 and 1987-88

Country (1)	Dep. Var. (2)	Const. (1) (3)	Const. (2) (4)	(Sg - Ig) (5)	(Sg - Ig)/Y (6)	Adj. R ² (7)
Africa						
Egypt	(1)	-2282*		-0.966**		0.698
	(2)		0.048		-0.330*	0.709
Ghana	(1)	-105.5		-1.071**		0.560
	(2)		-0.017		-1.009**	0.534
Kenya	(1)	-510.5*		-1.490		0.197
	(2)		-0.168**		-2.867*	0.233
Morocco	(1)	809.1		0.979*		0.600
	(2)		0.095**		1.278**	0.782
Tunisia	(1)	-171.5		-0.570		0.373
	(2)		-0.026		-0.501	0.294
Uganda	(1)	-31.2		-1.360**		0.523
	(2)		-0.004		-1.282**	0.537
Zimbabwe	(1)	-772.8		-2.189*		0.470
	(2)		-0.166		-1.992	0.396

Continued -

Table1 – (Continued)

Asia							
India	(1)	2443		-0.409**		0.802	
	(2)		0.024		-0.231		0.161
Indonesia	(1)	227.9		-0.174		0.169	
	(2)		-0.003		-0.210		0.100
Korea	(1)	1432		1.203		0.707	
	(2)		0.024		2.416*		0.553
Malaysia	(1)	492.6		-0.082		0.108	
	(2)		0.029		-0.012		0.031
Oman	(1)	247.3		-0.131		0.689	
	(2)		0.125**		-0.038		0.000
Pakistan	(1)	1756**		-1.327**		0.726	
	(2)		-0.019		-0.469		0.000
Philippines	(1)	1062**		-1.032*		0.451	
	(2)		-0.042**		-1.381**		0.499
Singapore	(1)	70.2		-0.760*		0.472	
	(2)		0.009		-0.970*		0.475
Sri Lanka	(1)	115.7		-0.008		0.022	
	(2)		0.032		0.074		0.039

Continued –

Table 1 – (Continued)

Country (1)	Dep. Var. (2)	Const. (1) (3)	Const. (2) (4)	(Sg – Ig) (5)	(Sg – Ig)/Y (6)	Adj. (7)	R ²
Asia							
Thailand	(1)	-1509**		-1.071**		0.245	
	(2)		-0.046**		-0.998*		0.115
Turkey	(1)	-2781**		-1.355**		0.464	
	(2)		-0.060**		-1.280**		0.289
Latin America							
Brazil	(1)	-9815**		-1.115**		0.911	
	(2)		-0.064**		-1.398**		0.903
Chile	(1)	-869.4*		-1.720**		0.478	
	(2)		-0.059*		-1.345*		0.437
Colombia	(1)	317.9		0.845*		0.322	
	(2)		0.010		0.813*		0.312
El Salvador	(1)	-112.5*		-0.904**		0.420	
	(2)		-0.019*		-0.888**		0.474
Mexico	(1)	-6599**		-0.952**		0.888	
	(2)		-0.052**		1.059**		0.915
Peru	(1)	-172.5		0.178		0.179	
	(2)		-0.014		0.147		0.185
Venezuela	(1)	1786		0.955		0.117	
	(2)		0.031		1.058*		0.145

Note: Coefficients with * and ** are significant at the 10 and 5 percent confidence level respectively.

Philippines, Thailand, Colombia and Peru. In 2 countries (Singapore and Chile) only the private sector showed negative savings balances, while in the remaining 3 countries (Indonesia, Korea and Venezuela) neither the private nor the public sector accumulated negative balances. These findings tend to confirm the widely-held view that public deficits are in most cases the prime cause of foreign debt accumulation in developing countries.

In passing it may be noted that Venezuela, one of the problem debtor countries, is listed here among the countries with a positive cumulative balance on the current account over the period 1972 – 1988. The answer to this paradox lies probably in unrecorded capital exports (capital flight) over the same period. In other words, Venezuela's liabilities to the rest of the world may well be offset to a large extent by the claims it holds.⁵

The development of public deficits appears to have taken an especially bad turn in many developing countries around 1980. Since we know that public investments have been reduced at the same time, it follows that public savings must have fallen even more. Indeed, other sources⁶ confirm that public savings – hardly ever a strong point of public policy⁷ – fell considerably in relative and even in absolute terms during the ensuing period.

We now turn to the results of tests of (2.3) as presented in Table 1 on lines (1). The results of regressions of (2.4), the standardised version of (2.3), are given on lines (2). A wide variety of developing countries has been included in the present exercise in an attempt to take account of the multitude of factors which may have shaped the relation between public and private net savings. So, knowing that the influence of these factors points in different directions, a great similarity in the outcomes for individual countries would obviously suggest domination of one such factor. However, a single pattern does not emerge from the figures presented in Table 1; coefficient c (in column 5) adopts negative values in some countries, positive values in others and does not differ significantly from zero in still other countries. Obviously, a negative value indicates a compensatory movement and a positive value a reinforcing movement of private savings *vis à vis* public net savings. In the first case the effect of, for example, an increase in the fiscal deficit on the deficit on the current account would be muted by an improvement in the private savings balance; in the second case, however, the effect would be amplified. Table 1 shows that in 14 countries coefficient c is significantly negative at the ten percent confidence level, while in 2 countries it is positive. In the other 9 cases the value of c does not differ significantly from zero. This distribution of values can

⁵See Sachs (1985).

⁶See e.g. FitzGerald and Sarmad (1990).

⁷See Voorrips (1991).

also be observed in the three continents separately, perhaps with the exception of Asia where a higher concentration of near-zero values can be found.

While the values of c vary, it should also be noted that they do not assume extreme values. For example, no number reported in column 5 is significantly below -1 . Of course, a value of $c < -1$ would imply that a change in net savings in one sector would be more than compensated by the reaction of the other sector; an increase in the fiscal deficit would thus result in an improvement of the current account. In the context of a model of a two-sector economy Borensztein⁸ shows that such an outcome may not be as unlikely as it seems, depending on the relative productivity in the home goods versus the international goods sector. Some evidence is provided in support of this argument. Here we must conclude that the present findings do not confirm it.

Comparing values of c with corresponding values of f (in column 6) one finds that the differences are insignificant in most cases. Countries deviating from this rule, such as Egypt and Pakistan, probably experience a correlation between gross national product and public net savings. The distribution of values of coefficient f is similar to that of c ; the overall score here is 12 negative, 4 positive and 9 near-zero values.

The above observations suggest that countermovement of private and public net savings is more common than comovement. This is perhaps not a surprising conclusion with a view to the constraint on capital imports in developing countries mentioned earlier. When this constraint is active, a fall in net savings in one sector of the economy must be compensated by a rise in net savings in the other sector in accordance with the inflexible law expressed by identity (2.2). The fact that there is no lag involved in (2.3) and (2.4), implying that the relations test an instantaneous reaction, adds to this argument.

In this connection, however, it is worthwhile to briefly consider the experience of developed countries. It is generally believed that these countries' access to international capital markets is relatively easy. Yet it has been found on several occasions that national volumes of savings and investments in developed countries are strongly correlated and that, therefore, even these countries' capital exports and imports are relatively thin. Whether this finding can be attributed to imperfections in international capital markets or to other factors is a matter of intense debate.⁹

For the subject discussed here it is important to note, however, that the correlation between savings and investments as observed in developed countries seems to be at least partly the result of a countermovement of public and private savings balances. In a study of 16 developed countries using data for the period 1965 –

⁸Borensztein (1989).

⁹For a survey of the literature, see Tesar (1991).

1982 Söderström¹⁰ finds that coefficient f is negative at the five percent confidence level in 12 countries and not significantly different from zero in the remaining 4 countries. In other words, the concentration of negative values of f in our tests relating to developing countries seems to be lower rather than higher than that in earlier tests relating to developed countries. This finding suggests that there are factors other than constrained international mobility of capital causing a negative relation between public and private net savings.

Visual inspection of the behaviour of net savings balances of individual countries over time as collected for the present exercise reveals that some countries – especially those in Latin America – shift from a pattern of comovement to one of countermovement of public and private savings balances. This shift occurred between 1980 and 1982. The timing, the swiftness and the location – Latin American countries being prominent victims of the debt crisis – of this phenomenon suggest a connection with the tightening of international capital flows. Unfortunately, it has not been possible so far to statistically identify the event which triggered this behaviour shift.

5. CONCLUDING REMARKS

It needs to be repeated that the present paper only gives some observations and no explanations regarding the relation between the savings balances of the public and the private sector in developing countries. Two possibly closely related questions stand out: (1) What causes c (and f) to differ between countries? and (2) Which trigger mechanism causes some countries to shift from a pattern where c (or f) > 0 to one where c (or f) < 0 ? Answers to these questions would at least require a study of the behaviour of the individual sectoral savings and investment variables composing the sectoral balances examined above.

Empirically verified relations can be used for policy purposes even if they are not properly understood, but in this case a word of caution is appropriate. For example, the decision to slacken fiscal discipline could be highly damaging to the economy concerned even if the savings balances of private and public sector appear to move in opposite directions. Only under special conditions – relating to the degree of capacity utilisation, the presence or absence of bottlenecks in production, the direction of public expenditure, the impact of private versus public expenditure, the mode of financing the public deficit, the size of the public debt and so on – can such a decision have beneficial effects.

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¹⁰See Söderström, *ibid.*, Table 1.6.

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Comments on
“Public and Private Net Savings in Developing Countries:
Some Empirical Tests for the Period 1972–88”

Mr Chairman, Professor Naqvi and friends, let me thank you for inviting me to attend the Eighth Annual General Meeting of the Pakistan Society of Development Economists. It is a pleasure to visit Pakistan again and I am delighted to see the political and economic changes since I was last here in 1986.

Let me now turn to Professor Cornelisse's paper. Professor Cornelisse has presented an interesting paper on a difficult and controversial topic. Even in countries like the U.S.A. where national debt has been increasing at an alarming rate and the balance of trade has remained in the red since 1981, there is no unanimity among economists that the public debt is a function of foreign debt.

The author states that there is a limit to the private sector's willingness to absorb bonds issued by the public sector which means that the public debt must ultimately be financed by foreign capital. If bond prices decline sufficiently the yield will rise and this will make it possible to obtain funds to finance investments. The crowding out effect, however, may be detrimental to economic growth in the long run.

The crowding out effect is largely the result of increasing public debt which is financed from the sale of government securities or borrowings from abroad. In any event this places a burden on future generations. Rising interest rate may indeed discourage private investment as well. The governments will also be obliged to allocate a larger percentage of their budget towards payment of interest. The public is thus taxed to pay for the services they do not receive but were rendered to the past generation(s).

This paper takes into account the effect of the National Debt on the Foreign Trade Deficit. However, in the literature such relationships are not widely accepted. In recent years greater attention is paid to this relationship, not so much in the context of the developing countries, as they are expected to import capital goods etc., but more so in the case of the developed countries.

Repayment of external debt places a constraint on foreign exchange and domestic debt financing. If continued on a long-term basis, it will tend to raise interest rates.

In preparing this paper the author encountered difficulties with data which places constraints on this study. I have serious problems with the model itself. The

author states that on a theoretical basis B has to be 1, in order to maintain the equality of the two sides of the equation. The statistical results presented in the paper are interesting. The conclusions are supported by the results. These results, given the constraints, may be considered as first approximations.

In conclusion let me state that this is an interesting topic and I suspect more work will be done in this area in the future.

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Comments on
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Budgetary development in recent years has emerged as the most notable problem of economic management in many developing countries. The current debate surrounding fiscal imbalances is now focussing on its macroeconomic effects on the various sectors of the economy. For example, the papers by FitzGerald (1979, 1980); Looney and Frederkisen (1987) and Khan and Iqbal (1991) deal particularly with this issue. In other words, these papers examine the impact of the fiscal deficit on private sector activities in developing countries.

The paper under review simply examines the empirical relationship between private and public savings for a number of developing countries. The paper presents only the empirical observations but gives no explanations regarding the relationship between public and private savings, hence very little policy implications come from the paper.

In order to examine the relation between public and private net savings the authors begin with a rather *ad hoc* equation

$$(E-M) = a + b (S_g - I_g)$$

where E and M represent total exports and total imports respectively and S_g and I_g represent public savings and public investment. It may be pointed out that Equation (2.1) or for that matter, Equations (2.2) and (2.3) are pure identities derived from the national accounts. For example, the national income account identity is written as

$$Y = C + I - E - M \quad \dots \quad \dots \quad \dots \quad \dots \quad (1)$$

where Y is gross national product; C is total consumption (private and public); I is total investment (private and public) and E and M are already defined above. The national income account identity can be written as:

$$Y - C = I + E - M$$

or $S = I + E - M$

or $S_p + S_g = I_p + I_g + E - M$

$$\text{or } E - M = (S_p - I_p) + (S_g - I_g) \quad \dots \quad \dots \quad \dots \quad \dots \quad (2)$$

where subscript 'p' and 'g' refer to private and public respectively. Our Equation (2) is the author's Equation (2.2) which is simply an identity derived from the national accounts. It is not clear as to how the author has converted an identity into a structural equation with 'a' and 'b' as its parameters.

The author claims that different values of the parameter 'b' represent different theories which as the fiscal approach to the balance of payments advocated by the New Cambridge school, the Mundell-Fleming model with Keynesian setting and the Ricardian Equivalence Hypothesis. The author argues that Equation (2.1) cannot be used for developing countries because it assumes perfect capital mobility. Therefore, using apparently the national income identity, the authors derive Equation (2.2) and by substituting Equations (2.1) in Equation (2.2) they arrive at Equation (2.3).

First of all it is not clear as to why Equation (2.1) assume perfect capital mobility while Equation (2.2) implies imperfect capital mobility? Second, whether the author has a Feldstein and Horioka (1980) type of analysis in mind when he talks about perfect/imperfect capital mobility?

Coming to the result part of the paper, the author finds, in some cases, public and private savings are substitutes and in other cases complements of each other. In the case of substitutes, an increase in the fiscal deficit implies an increase in private saving. Does this mean that a country like Pakistan whose private saving is very low should tolerate large fiscal deficits to raise private savings? The authors' answer is yes but under special conditions. It would have been extremely useful, had the authors spelled out the exact condition under which large fiscal deficits increase private savings.

Furthermore, the author has discussed the coefficient 'c' of Equation (2.3) but $c=b-1$, therefore, the coefficient 'b' could have been derived and discussed in relation to the three theories which the author has discussed at the beginning of the paper.

By looking at Equation (2.3) it is not all clear whether the direction of causation is running from public sector savings to private sector savings or is it the other way around or whether is it bi-directional. Both private and public sector savings appear to be interdependent and hence, using OLS could introduce a simultaneous equation bias.

It would have been much better had the author given the explanation of substitution/complementary role of public and private savings. Why in some cases is it a substitute and in other cases a complement?

Furthermore, what do these results suggest in terms of various theories that have been discussed in the paper?

At the end, I must say that the paper has touched an interesting area where ample scope for further research exists.

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