Feldstein-Horioka Puzzle and Saving-Investment Relationship in India during Globalisation Era

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Abstract- *Feldstein-Harioka Puzzle brings out contradiction with the hypothesis of free capital flows by looking at co-relationship between domestic saving and domestic investment for globalised economies. Puzzle states that in spite of countries having free capital flows do not have a weak relationship between domestic saving and investment. This questions the argument for free capital movement as source of raising domestic investment at higher level. The current paper investigates the same issue in case of Indian Economy which has gone through current and capital accounts liberalisation. The Feldstein-Harioka Puzzle still holds in case of Indian economy for the globalised period between 1991-92 and 2011-12.*

Introduction

India has gone through implementation of a series of economic reforms intending to integrate it with the rest of the world. 1991-92 was the time since when various measures have been adopted in the framework of globalization, privatization, and liberalisation. Liberalisation of quantitative and qualitative measures with regard to the current account was a natural outcome of the neo-liberal economic policy framework. This initiative necessitated the removal of certain restrictions on the capital account of India. Enactment of full convertibility of Rupee on current account and partial convertibility of Rupee on capital account was very significant step in integration of India with the rest of the world. It was also argued by many economists that globalization will lead to saving surplus countries to invest in India where investment was being perceived as being constrained by the limited saving pool within the economy. It is based on the fact that in a world of perfectly mobile capital any country's level of investment will not remain constrained by the level of savings of that country as long as the return on investment is attractive. Simultaneously if the return on investment in that country is not that lucrative then domestic saving may flow out in other countries where the rate of return is better. So the given fact that in world of perfectly mobile capital there should not be perfect relationship between the domestic saving and investment. On the other hand if there is close to perfect correlation between domestic saving and investment then the assumption of perfect capital mobility does not hold. In case if there is substantial inflows of foreign capital in the country and simultaneously there is close to perfect relationship between the domestic saving and investment then this violates the whole purpose of capital account liberalisation to enhance the level of savings. A study was conducted way back in 1980 by Martin Feldstein and Charles Horioka looking at the relationship between saving and investment of 16 OECD countries for a period of 15 years (1960 to 1974). They found that there was close to 1 relationship coefficient between domestic saving and domestic investment rejecting the hypothesis of perfect world capital mobility. This paper attempts to undertake the similar exercise about India after its experience with the capital and current account openness over a period of twenty years (1991-92 to 2011-12) to see if the domestic savings explain the investment behaviour in India during the post-liberalisation period in

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similar way as before the liberalisation period. This paper has been divided into five sections excluding introduction. The first section describes the Feldstein-Harioka Puzzle. Second section elaborates the trend of capital account liberalisation in India. The third section discusses the trends of saving and investment in India for a period from 1970-71 to 2011-12. The forth section discusses the statistical results about the relationship between domestic saving and investment in India. The final section concludes the study with note on possible scope of further study on this issue.

What is the Feldstein-Horioka Puzzle?

This puzzle is based on the theory of relationship between saving and investment. Theory states that in a closed economy, level of total domestic investment will be determined by level of total domestic saving; which means domestic investment (I_d) is equal to domestic saving (S_d). It implies that if the country wants to raise the level of investment then it has to ensure high level of saving. This theory states that developing countries are characterised by low investment because of their lower saving. Mckinnon (1973) argued that internal and external financial liberalisation will leads to enhancement of saving domestically as well as availability of foreign saving to boost the level of domestic investment and which in turn will cause the level of economic growth to go up. The above mentioned logic also implies that in a closed economy as there will be perfect relationship coefficient between total domestic investment and total domestic saving and the correlation coefficient will be one. If an economy is open and the returns on investment in a country is higher than rest of the world then the foreign saving will flow to the domestic country and the investment will exceed the domestic savings. Similarly if the domestic saving receives higher returns in the rest of the world then the total domestic investment will be less than total domestic saving. A perfectly globalised country, with the absence of any restriction on flow of capital, will be characterised by: Gross Domestic Investment (I_d) = Gross Domestic Savings (S_d) + Net Foreign Savings available domestically (S_f). In case of an open economy correlation coefficient of total

domestic investment and domestic saving will be close to zero. Such logical relationship between domestic investment and saving became a basis for the research conducted by Martin Feldstein and Charles Horioka in 1980 to test if there was capital mobility in the OECD countries between 1960 and 1974.

They used the data on gross domestic saving and gross domestic investment for all 16 OECD countries for the period between 1960 and 1974. However they had taken in total 21 countries but given the non-availability of data in consistent way they dropped six countries from the sample and confine to only 15 countries. They estimated the coefficient of relationship between gross domestic saving and gross domestic investment for each country across 16 OECD countries using the following equation:

$$\left(\frac{I}{Y}\right)_{it} = \alpha + \beta\left(\frac{S}{Y}\right)_{it}$$

They argued that as per perfect capital mobility logic the estimate of β in extreme case should be close to zero for small open economy. However, the estimate of β close to 1 would indicate that most of the incremental saving in the country remained there hence this will be strong evidence against hypothesis of perfect capital mobility. Their estimate of β for the entire period of 15 years sample for 16 countries showed to be 0.89 (S.E. = 0.07). This coefficient was not significantly different from 1 and this went against the hypothesis of perfect world capital mobility. This finding became a puzzle as there was free mobility of capital and there still existed higher co-relationship between gross domestic savings and gross domestic investments in OECD countries.

Measures of Capital Account Liberalisation in India

After the 1991 Balance of Payment crisis in India, the Report of the High-Level Committee on Balance of Payment (BOPC), 1993 laid out the genesis of capital account liberalisation in India. The initiative of capital account liberalisation was as a compulsory outcome of the trade liberalisation. Both the policies of trade

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liberalisation and capital account liberalisation were part and package of Washington Consensus which was imposed on India as the IMF's Conditionalities. The external sector reform was accompanied by internal reforms such as liberalisation of licensing regime as well as privatization of state resources (Chandrasekhar and Ghosh, 2006). A committee in the chairmanship of M. Narasimham was set up in 1991 to provide the roadmap of financial sector liberalisation and this Committee's reports were accompanied by various committees' reports to complement the neo-liberal economic framework. However, the BOPC intended to change the composition of capital account by introducing following measures:

a. Replacement of debt with non-debt creating capital inflows by liberalisation of portfolio equity inflows in 1994.

b. Freeing outflows associated with inflows such as principal, interest, dividend, profit, and sale proceeds from foreign investments in the country.

c. Dissociation of government from Intermediation in external aid flows.

d. Portfolio investments in the primary or secondary markets were permitted subject to percentage ceilings.

e. Indian companies were permitted to invest abroad up to an annual ceiling of $ 100 million, above which it requires RBI's permission.

f. Indian companies were allowed to borrow abroad up to $ 1 million with a minimum maturity period of three years.

g. FDIs were allowed up to 100% in all except thirteen items and for another seven items where less than 100% equity was allowed.

h. Banks were allowed to borrow abroad up to 25 % of paid up tier one capital or $ 10 million whichever is higher with the permission of ministry of finance.

i. End use restrictions were removed except for stock market and real estate investments.

j. Infrastructure sectors were allowed to ECBs subject to 50% of the project costs.

Apart from above measures, Government of India set up a Committee in 1997 to provide a roadmap to liberalise the capital account of the country. The Committee recommended various pre-conditions to start the capital account liberalisation which included reduction in fiscal deficit, control of inflation, liberalisation of financial market, and withdrawal of state from various avenues. We must know that many of these measures have negative impact as far as social welfare policies of the government is concerned such as food subsidy, educational provisions, health facilities, and employment stabilization program. After the recommendation of Tarapore Committee, 1997 Government decided with the partial capital account liberalisation. However due to economic crises in East-Asian Countries there was little boulder in front of the wheel of capital account liberalisation policies as recommended by the Committee. However the Government of India restarted the process of capital account liberalisation by opening up the various sectors to foreign participants. To expedite the process of capital account liberalisation towards fuller capital account convertibility the Government of India set up again the committee in the chairmanship of S.S. Tarapore in 2006. This committee recommended many measures such as raising the overall ceiling of External Commercial Borrowings (ECBs) under the automatic approval, raising the limit of outflows of capital by Indian industry from 200 percent of its net worth to 400 percent, allowing the non-resident corporate to invest in Indian stock market through SEBI registered entities including mutual funds and portfolio management schemes, etc.

Such policies led to opening up of the economy on capital inflows and outflows dimensions. A study by Shah and Patnaik (2011) shows that capital account integration measured by Lane and Milesi-Ferretti database increased from 30 percent of GDP in 1990 to 42 percent of GDP in 2000 and it further increased to 85 percent in 2007. This indicates sufficient level of capital account opening to understand if the domestic investment increased to higher level due to foreign capital. In the following section we discuss the behaviour of investment and saving in India for pre and post-liberalisation period.

Trend of domestic investment and saving in India

Table 1 indicates the trend of gross domestic saving and gross domestic investment as percentage of gross domestic product. The Table 1 shows the substantial increase in the saving and investment level as percentage of GDP. Gross domestic saving increased from 14 percent in 1970-71 to 22 percent in 1989-90. Thereafter it remained around 24 percent till 2002-03, but it increased to substantial level after 2002-03 and reached to 34 percent in 2009-10. The period after 2009-10 witnessed decline in saving ratio. The trend of gross domestic investment shows that it was 15 percent of GDP in 1970-71 and it rose to 24 percent in 1989-90. Thereafter it remained around 24 percent till 2002-03 and picked up sharply to 36 percent by 2009-10 but witnessed decline thereafter. So we do not see much improvement of saving and investment till 2002-03. Graph 1 shows the rising trend of saving and investment since 1970-71.

Table 1: Share of domestic saving and domestic investment

| Year	S/GDP	I/GDP	Year	S/GDP	I/GDP
1970-71	14%	15%	1991-92	22%	22%
1971-72	15%	16%	1992-93	21%	23%
1972-73	14%	15%	1993-94	22%	22%
1973-74	16%	17%	1994-95	24%	26%
1974-75	16%	17%	1995-96	24%	26%
1975-76	17%	17%	1996-97	23%	24%
1976-77	19%	18%	1997-98	24%	25%
1977-78	19%	18%	1998-99	22%	23%
1978-79	21%	21%	1999-00	25%	26%
1979-80	20%	20%	2000-01	24%	24%
1980-81	18%	20%	2001-02	23%	23%
1981-82	18%	20%	2002-03	26%	25%
1982-83	18%	19%	2003-04	30%	28%
1983-84	17%	18%	2004-05	32%	33%
1984-85	18%	20%	2005-06	33%	35%
1985-86	19%	21%	2006-07	35%	36%
1986-87	18%	20%	2007-08	37%	38%
1987-88	20%	22%	2008-09	32%	35%
1988-89	21%	23%	2009-10	34%	36%
1989-90	22%	24%	2010-11	34%	32%
1990-91	23%	26%	2011-12	31%	31%

Source: Economic Survey 2012-13

Graph No. 1: Trend of saving-GDP and Investment-GDP ratios

Graph 2 shows the difference of gross domestic investment over gross domestic saving as percentage of GDP. It has very remarkable trend in which it shows that period between 1980 and 1991 the investment-saving gap was around 3 percent (investment exceeding saving). While for the rest of the period particularly during liberalisation period level of investment is close to the level of savings. Domestic investment exceeding domestic saving was the result of active state intervention in the Indian economy. It was observed that government followed expansionary fiscal policy to the great extent to boost the economy and manage the demand level at higher degree. In fact, the 6.7 percent gross fiscal deficit to GDP ratio of the Central Government during the 1980s coincided with a rise in the Central Tax-GDP ratio from 9.07 in 1980-81 to 10.59 in 1989-90 (Kumar and Soumya, 2010). The average annual Tax-GDP ratio for 1980-81 – 1984-85 was 9.27 and that rose to 10.45 for 1985-86 – 1989-90. This clearly indicates that the rise of fiscal deficit of the Central Government was not due to a decline in its tax revenue.

Graph 2: Trend of difference between domestic investment and saving as percentage of GDP in India

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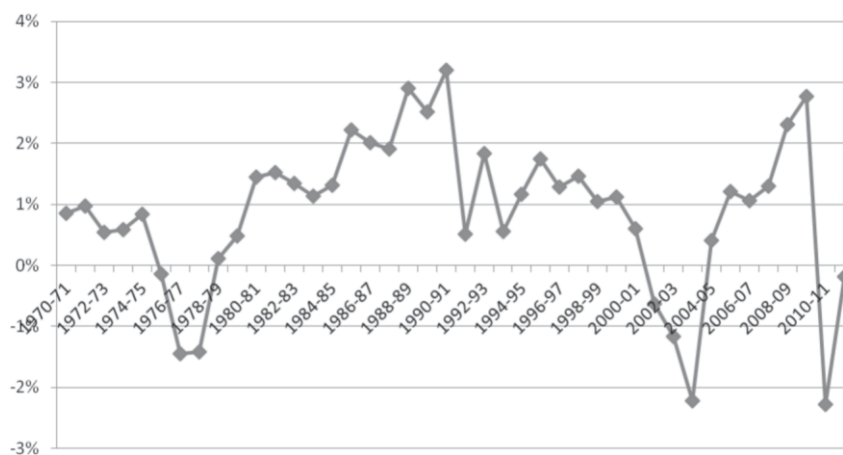
The regression results on relationship between domestic saving and domestic investment in India.

The regression test conducted to see the relationship between domestic saving and domestic investment shows that the period before economic liberalisation was characterised by high value of β which was reported to be 1.16 with the value of R-square equal to 0.85. This explains the variation in I/Y is explained by S/Y by 85 percent. This means that when S/Y rises by 10 then I/Y also rises by 10.16 and such relationship between I/Y and S/Y is explained to the extent of 85 percent. This is close to the finding of Feldstein-Horioka for the OECD countries. This signifies that the pre-liberalisation period was characterised by global capital immobility. The estimation of β for the period of post-economic liberalisation indicates that value of β declined to 0.98 with the rise of R-square up to 0.94. That means the domestic investment remained to great extent dependent upon the level of domestic investment. If we divide the total period of study (1991-92 to 2011-12) into four sub-periods to check the relationship coefficient for each period then we find results mentioned in the Table 2. Such results clearly states that capital mobility or capital account opening has least affected the domestic investment. Of course the period between 2006-07 and 2011-12 does show some sign of decline in the value of R square showing the weakening role of domestic saving in explaining the trend of domestic investment but the value of the value of β, which is close to one, shows that hypothesis of capital mobility does not hold.

Table 2: Regression results for the relationship between Saving-GDP ratio and Investment-GDP ratio

Period	β	R square
1970-71 to 1990-91	1.16	0.85
1991-92 to 2011-12	0.98	0.94
1991-92 to 1995-96	1.13	0.90
1996-97 to 2000-01	0.99	0.91
2001-02 to 2005-06	1.17	0.95
2006-07 to 2011-12	1.07	0.59

However we tried to see the trend of net capital inflows to analyse if it has financed the additional investment over saving. The Graph 3 shows that from 1983-84 to 1993-94 (I-S)/Y and NCIF/Y have moved closely but the later period is characterised by no corresponding relationship between these two variables. Question arises that what could be the reason for this that on the one hand we see rise in net capital inflows but on the other hand this does not get reflected into investment level. It could be possible that most of the net capital inflows has been either replacing the domestic investments through mergers and acquisition as well as coming in the form of short-term equity investments, which does not play any role in the domestic capital formation.

Graph 3: Trend of Investment-Saving gap and Net Capital Inflow
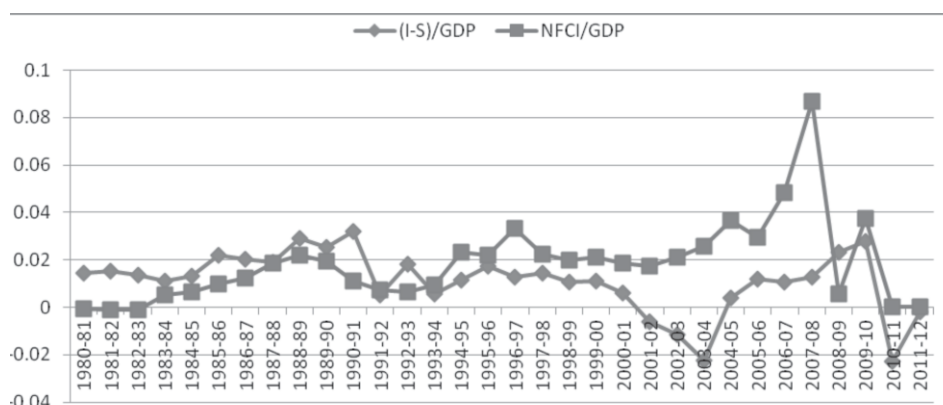
Source: Calculated from Economic Survey-2012-13 and Handbook of Statistics on Indian Economy-2012-13

Conclusion

A limited degree of analysis of the relationship between gross domestic saving and gross domestic investment in India as per the Feldstien-Horioka model indicates that in spite of greater capital account openness the level of investment is still being financed by domestic investment. This leaves the puzzle unresolved in case of India as well even though India has gone vigorously deregulating its capital and current account. It also questions the stand that external financial liberalisation will result in reducing the domestic saving constraints on domestic savings level.

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