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Asymmetric Demography and Global Financial Governance: In search of growth and common interests in the post-crisis world

A Study of Demographic and Financial Changes in India

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Abstract

This chapter demonstrates the role of financial sector in achieving the demographic dividends for the Indian economy. We developed an aggregative macro-econometric model supplemented by sectoral analysis of saving, investment and industrial productivity to explore possible connections. The model highlights the sensitivity of financial development to capital inflow with subsequent implications for the demographic dividends. We show that the benefits of the second demographic dividend in India are critically dependent on a significantly higher accumulation of assets that can be made possible via greater financial depth. In India, the sectoral composition of foreign capital has been biased towards service sectors, particularly banking and finance, albeit the inter-sectoral mobility of capital, however small and restrictive it might be, renders substantial impact on the productivity and employment in the unorganized sector of the country. Notwithstanding such possibilities, the unorganized sector and more broadly the agricultural sector is still largely outside the formal credit network with the institutional credit flow declining over time. We propose that in order to reap the benefits of the demographic dividends, the financial sector policies, especially the banking sector policies, should be geared to bring the rural and informal industrial sector under the banking network much more aggressively. The mobilization of untapped savings and the expansion of lending institutions under strong legal support should crucially facilitate better realization of demographic dividends in India.

Keywords: Demographic dividends, Financial development, Banking policy, Capital inflow, Informal sector

JEL Classifications: J2, E2, E5, F4, G2, O4, O5, J3

1. Introduction

Over the last two decades countries like China, India, Brazil, South Africa and the Russian Federation experienced sweeping changes in their economies. Albeit, the economic and financial reforms, which are credited for such changes occurred at different times for these countries the outcomes seem quite similar by the time these economies settled onto their respective growth trajectories. It is no wonder then that the global forums recognize these economic successes as defining the new economic order, despite admission of critical internal disadvantages that continue to group these countries alongside other developing and transition economies. The present chapter attempts to review the macroeconomic and financial conditions prevailing in India during this important transition period. The main focus of this research, therefore, is to explore and observe the possible links and synergies between economic and financial developments functionally related to an important and yet relatively less emphasized factor, namely, the changing demographic pattern in India.

It has been lately acknowledged that the relationships between demography, growth and distribution are quite different across countries mainly owing to asymmetric transition patterns in their population structure. Mindful of such possibilities and evidence, we make an attempt to relate demographic changes to the developments of the financial architecture in post-reform India and cover a void in this literature. It seems, broadly speaking, that the demographic asymmetry is also the source of higher growth rate in some of the south countries over a considerably long phase, arguably owing to the so-called first and second demographic dividends. In an increasingly integrated global system of commodity and factor flows, gains from such growth are rarely restricted to these countries alone. Notwithstanding, the persistent savings-investment gap (see, Basu 1997) continues to be a compelling source of transactions between the north and the south with significant inter-linkage effects spread out

globally.

The plan of the chapter is as follows. In section 1.1, we offer the important macroeconomic characterizations for India, where the population growth, the savings patterns, the investment patterns, trade patterns and capital inflows, all as part of the GDP are discussed in order to motivate the macro-econometric exercise that we engage with in section 2. A review of the literature reveals that studies in this area are generally scant, and especially so for India.[1] In this regard, the chapter aims to do justice to the two main objectives, namely, identification of the financial institutions that interact with demography, and two, the exploration of the relationship between specific macroeconomic variables such as cross-border capital flows and the interest rate, to the changing demographic pattern. In the process, we investigate if the overwhelming size of the unorganized sector in India can have interesting links to potential demographic dividends. In section 3 we show that capital flowing into the organized sector creates jobs in the unorganized sector, via outsourcing and technology transmission epitomizing internationalization of production (Hanson, 2001). Note that, the inflow of foreign direct investment (FDI) in the developing countries over the last few decades has also been one of the most vibrant instruments of global standardization, especially through sectoral spillovers. However, FDI has led to both production integration as well as fragmentation. Of these, production fragmentation allows firms to utilize cheaper factors, such as low-cost labor inputs, along the value-added chain leading to gains from specialization (Deardorff, 2005; and for outsourcing, see Helpman, 2006). Using recent survey data, we establish in section 3 that foreign investments in the organized sector may

[1] However, Dyson (2008) offers a comprehensive survey on the general issues of demography and development process in India. See also Visaria (2009), Devika (2008), Thapa *et al.* (2012), James and Subramanian (2003), Ladusingh and Narayana (2011) and in a comparative assessment across Asia, Asian Development Bank (2011).

lead to outsourcing to unorganized sectors. Previous studies on interactions between organized and unorganized sectors following globalization (see, Harriss 1990, Guha-Khasnobis and Kanbur 2006, Marjit 2003 and in particular, Siggel, 2010, for a review) do not make an attempt to relate that to the growing population and demographic dividends facing the country in question. In terms of demographic dividends high degree of informality in a country is not expected to raise productivity and economic benefits out of a large working age population. To add to the woes, the rural and underdeveloped India still hosts 68% of all population, suggesting that the demographic transition would only have considerable economic merit, if the economic and financial conditions in rural areas improve significantly. In section 3 we further discuss that unless the capital constraints in the rural areas are overcome with significant alacrity, the entire discussion on the demographic dividends shall be futile. These also constitute our predominant policy suggestions provided in section 4.

1.1 The Indian Perspective

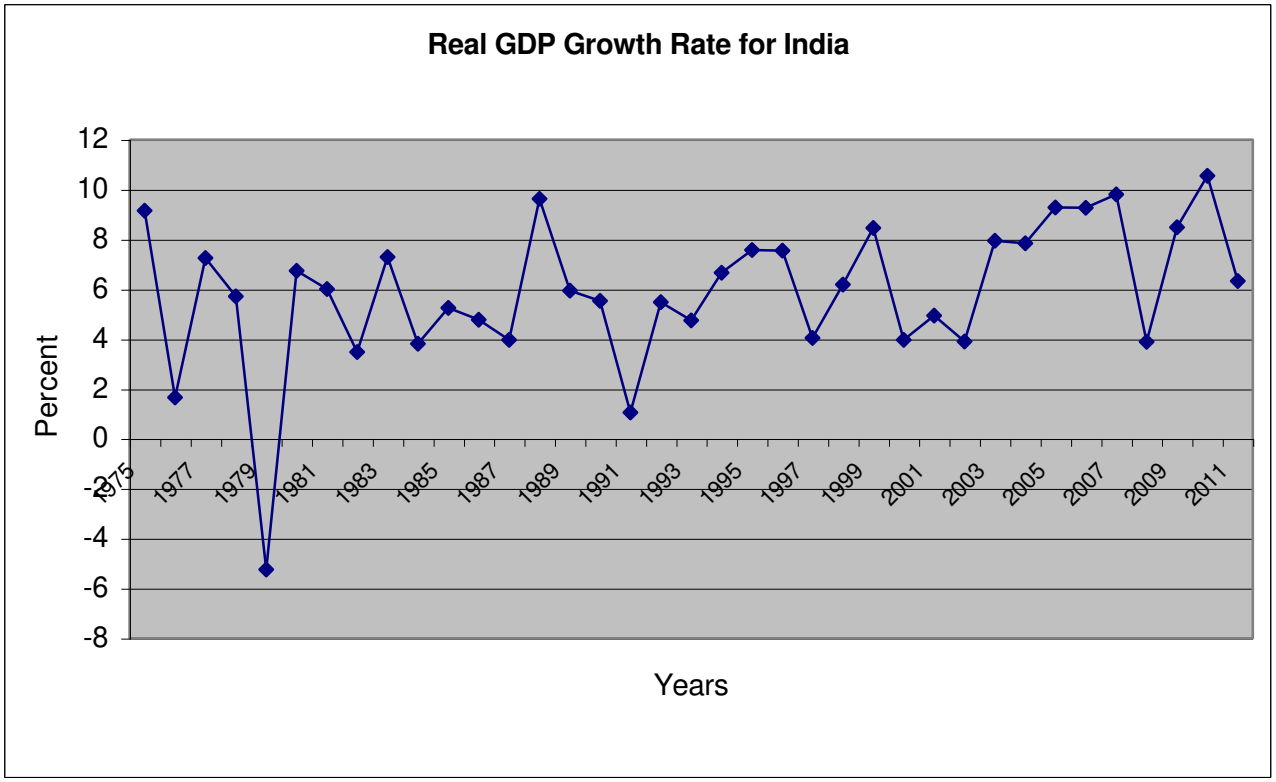
Let us elaborate briefly on what the first and second demographic dividends imply for India. The much discussed rise in India's demographic dividend means that the country's dependency ratio, as measured by the share of the young and the elderly as a fraction of the population, will come down more sharply in the coming decades. Increase in the share of working age population implies that more workers in the productive age groups will add to the total output, generate more savings, accrue more capital per worker, and all of these would lead to higher economic growth. It is further expected that since demographic change is associated with decline in fertility, the transition shall be accompanied by greater female participation in the labor force. According to the India Population Census (2011) figures, the total population in India is 1.21 billion, which is expected to rise up to 1.40 billion by 2026

mainly owing to an increase in life expectancy at birth for males and females from 65.8 and 68.1 years, respectively. These figures reported between 2006 and 2010 shall rise up to 69.8 and 72.3 years respectively during 2021–2025. Second, a decline in the total fertility rate (TFR) from 2.6 to 2.0 is the main initiator of demographic dividends, such that the fall in TFR (with older generations having shorter life expectancies), the dependency ratio declines dramatically. The overall effect is considered as the source of demographic dividend for India. The implications of the demographic transition on age structure are further evident for the population below 20 years, for which the share in total population went down from 51% in 1970 to 41% in 2010 and may further decline to 22% in 2050. During the same period, the share of the total population under the age of 60 marginally increased from 5.5% to 8%. This will rise and is expected to reach 22% in 2050. The large decline in the share of the population under 19 years of age has been associated with a substantial rise in the proportion of the working-age population (19–59 years) from 43% to 51% between 1970 and 2010 and is forecasted at a maximum of 56% by 2045.

Within India, not surprisingly, the distribution of population growth has been asymmetric. The rural population in India is still around 68% of the total population (Census of India, 2011), whereas, the urban population pattern is somewhat similar to comparable countries. Also not unexpectedly, the windows of opportunities are proportionately more concentrated in the urban areas, such that, the dwindling prospects in agriculture shall perpetuate the rural-urban migration as characterizing the path of development for the last several decades. The interface between the financial systems as a whole, access to more productive economic activities and the population distribution therefore needs a re-evaluation.

Viewed over a three-decade horizon, the GDP growth rate in India (Fig. 1.1) hovered between 9% way back in 1977 to negative and fairly low growth rates for most parts of the decade of the 1980s. In the post-reform (1991) period, while the country grew at 6% rate in most years, by the year 2000 it crossed the 8% mark and despite 4% growth rates in the following three years it went up to 8% once again in 2004. Subsequently it grew at 9% and 10% rates until 2009 when the onset of global recession pushed it down to 4% again. Nevertheless, and somewhat contrary to the global trend, India registered more than 10% growth even for 2011, beyond which however, the rate of growth caved in with revised estimates at 5.2% in 2013.

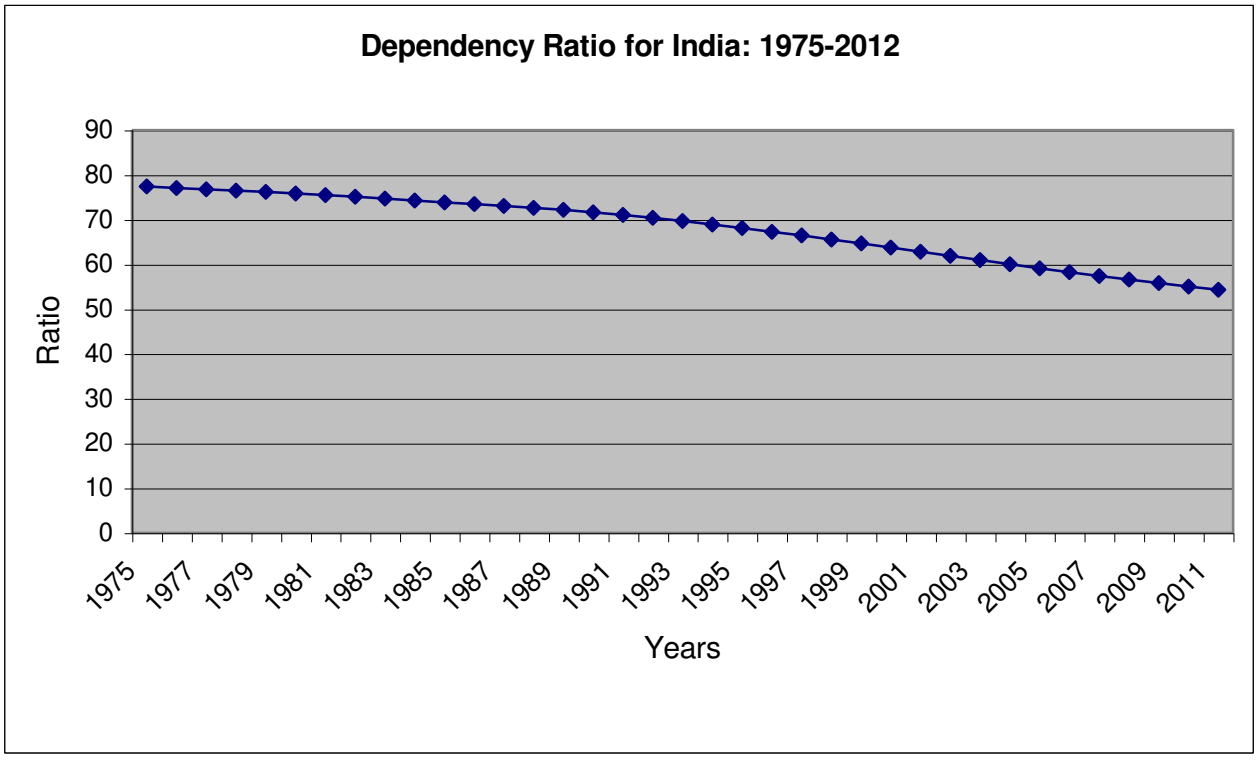
Figure 1.1 Real GDP Growth Rate for India: 1975-2012



Source: WDI, World Bank

Since the focus of the present chapter is about the demographic transition in India Figure 1.2 shows that the dependency ratio (defined as, $\left[100 - \frac{labor\ force}{Total\ Population} \times 100\right]$) has been going down steadily over time – a characteristic associated with the rising share of 15-59 year old population (see Albrieu and Fanelli, 2012 for cross country comparison and analysis). Since the base population is already high for countries like China and India, it is expected that the demographic dividends might be more for these countries provided adequate opportunities through human capital growth and access to economic and financial activities present themselves. Importantly, the dependency ratio for India has come down to 50 in the year 2012.

Figure 1.2. Dependency Ratio for India: 1975-2012

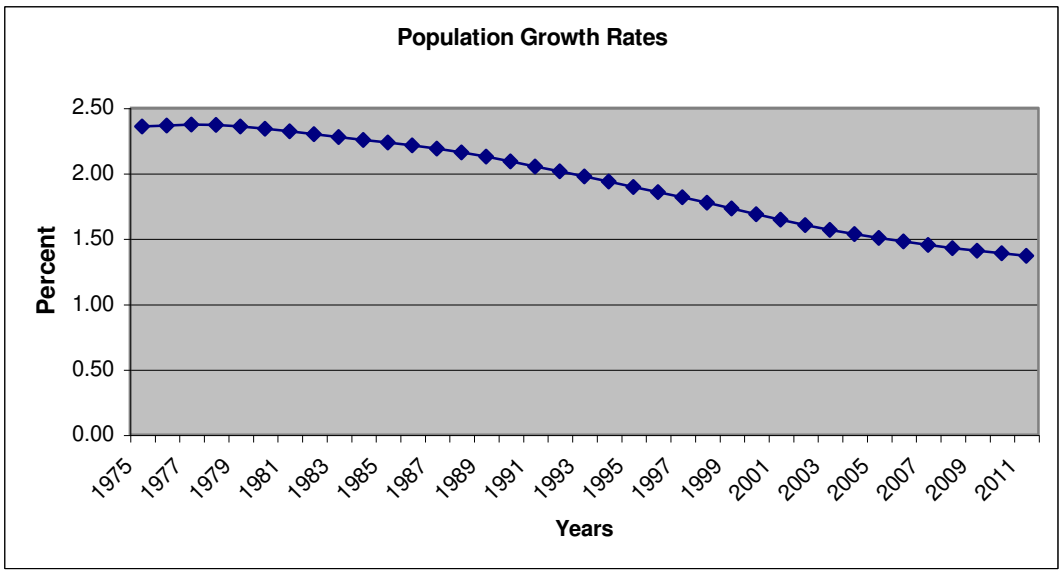


Source: WDI, World Bank

The population growth rate stuck between 2.5 and 2% until 1990s went below 2% for

the first time in 1993. The downward trend has continued since then with the growth rate at 1.5% in 2012. The population growth rate is still sufficiently high (despite significant urbanization and improvement in literacy rates) to expect a high rate of entry into the workforce. If the trend continues even for the medium run, one should expect co-existence of young and ageing population, the latter supported via transfers.

Figure 1.3 The Population growth rate in India: 1975-2011

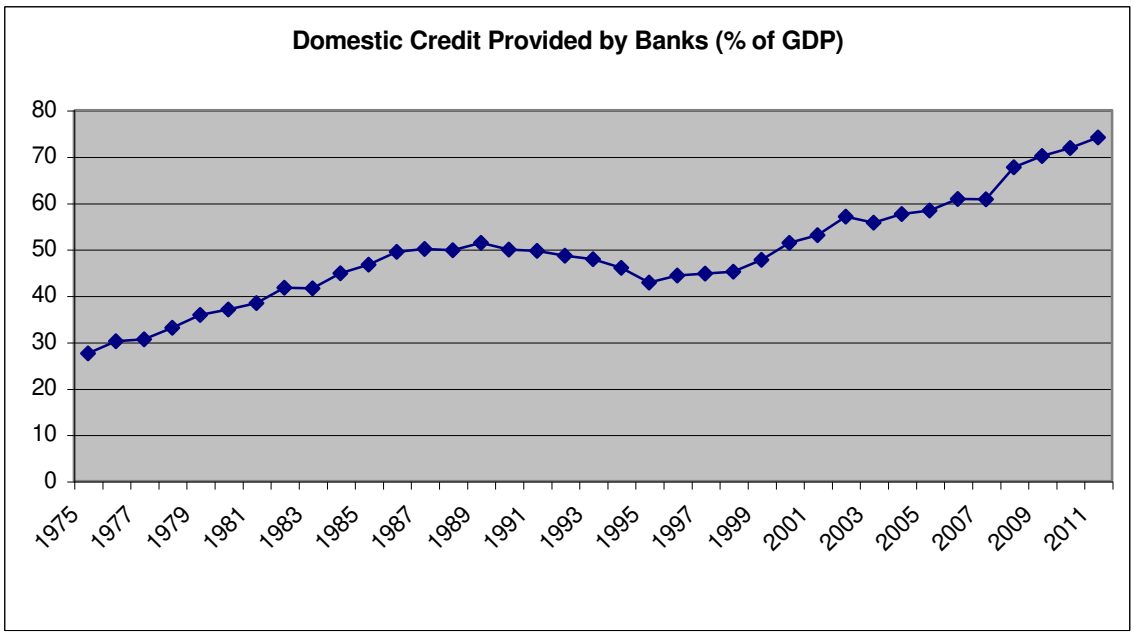


Source: WDI, World Bank

The relevance of the economic and financial institutions is unmistakable in such an environment. It is expected that the bank-based financial system in India shall bestow greater access to credit and allied facilities for partaking the economic and financial benefits of a growing labor force. Figure 1.4 suggests that the domestic credit flow in India has risen from a meager 25% in 1975 to almost 75% in 2012, which given the GDP of India is considerably large. It should also be noted that the outreach of the financial sector and the instruments of investments available thereof are in much better shape at least as far as the stock market activities of India (figure 1.5) are concerned. India seems to be trading larger amounts in stocks and after a peak in the year 2000 (same as China) the value is at a significantly high

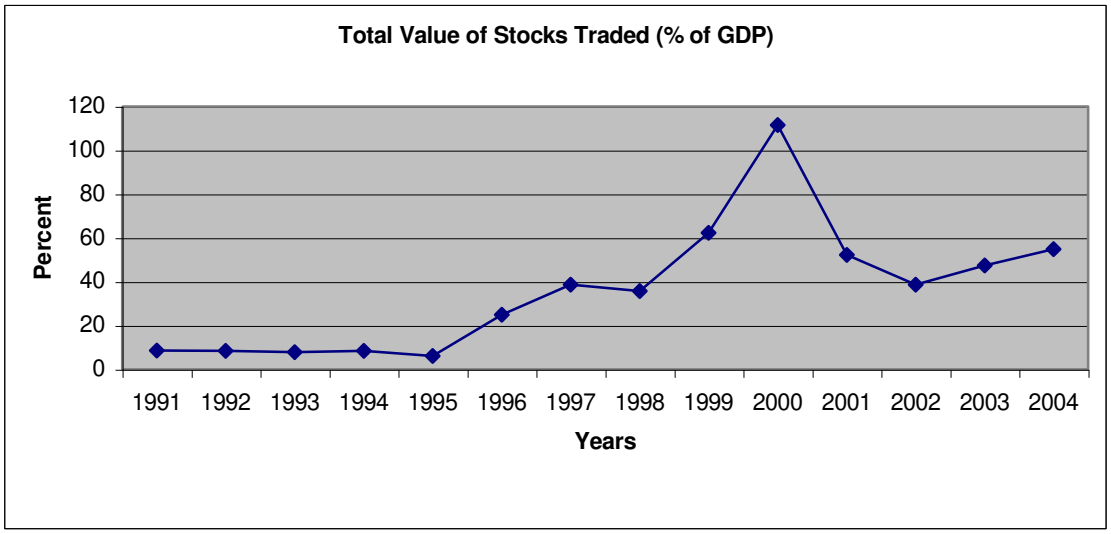
level (60% of GDP). These are suggestive of financial depth and vibrancy for a country in need of many other interventionist policies to rise to the level of the developed world. In fact, in recent times the role of financial system in the growth process has experienced a renewed interest (see, Levine, 1997, 1999, 2004; Levine, Loyaza, and Beck, 2000; Obstfeld, 1994; and for India see, Das and Guha-Khasnabis, 2005).

Figure 1.4 Domestic Bank Credit as % of GDP



Source: WDI, World Bank

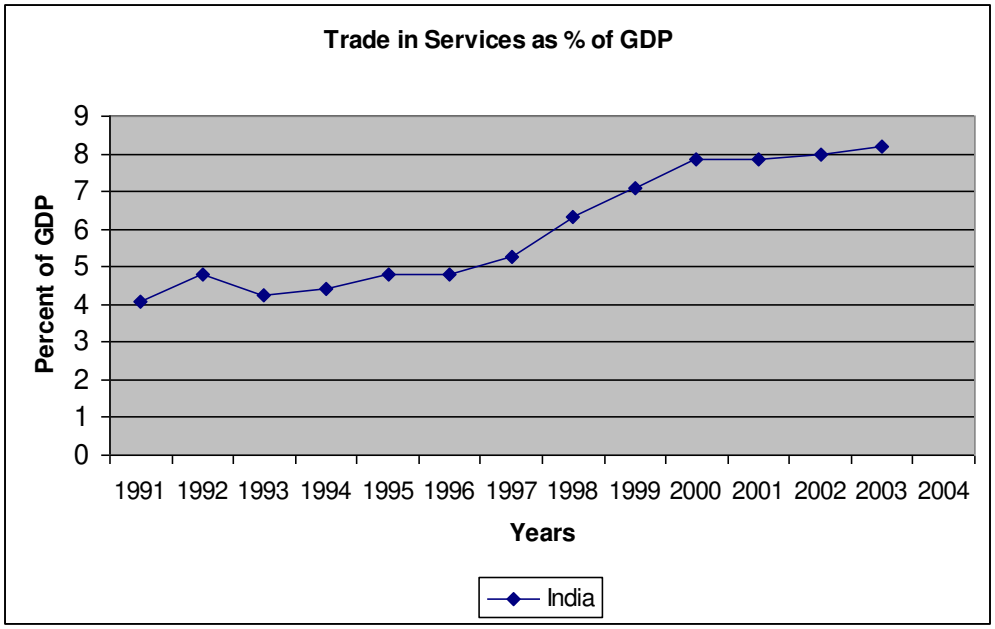
Figure 1.5 Total Value of Stocks Traded in India



Source: WDI, World Bank

Interestingly, during the same period India leapfrogged to the world of service sector related activities. In fact, India's share of service sector in its GDP has gone up to more than 50% (figure 1.7) and in terms of the trade in services, India (at 8% of GDP by 2004, figure 1.6) is also doing better compared to some of the other countries in this group.

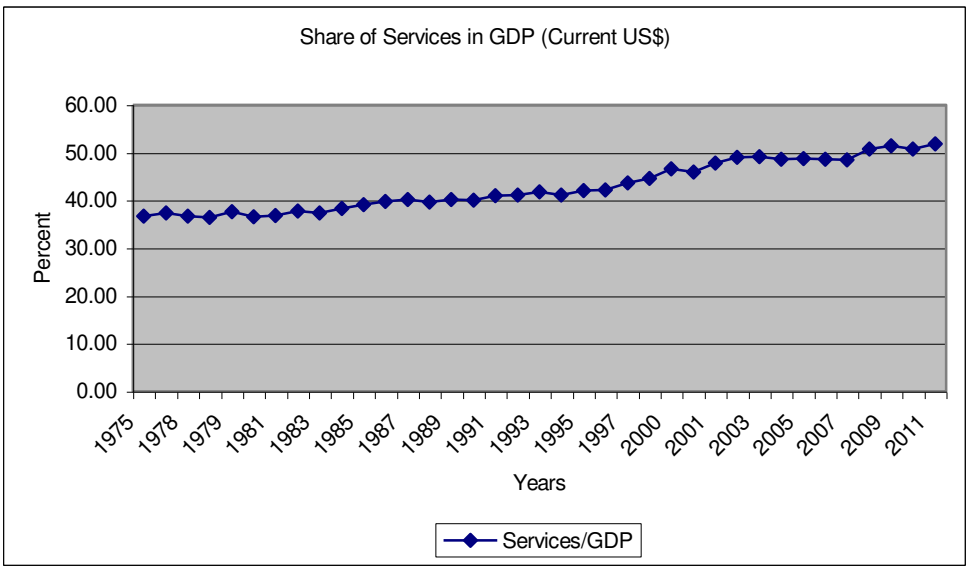
Figure 1.6. Trade in Services as % of GDP



Source: WDI, World Bank

Note further, that the inflow of northern capital seeking higher per unit return on the dollar invested is one of the major resource base for the sprawling service sector. The growth of financial intermediaries and the development of a well functioning financial market are only natural derivatives of these complex interactions.

Figure 1.7 India's Share of Service Sector in GDP



Source: Reserve Bank of India, Handbook of Statistics on Indian Economy

Section 2 uses the cross-country financial flow as an important instrument to trace the demography-to-growth link. It seems that the sectoral composition of foreign capital inflow has the largest share (19%) coming to the service sector and more specifically to the banking and finance sector (Table 1.1). This is followed by construction (11%) and telecommunication (7%). The country-wise share of aggregate foreign capital inflow to India is as follows: Mauritius (38%), Singapore (11%), UK (9%), Japan (7%) and USA (6%).

Table 1.1 Sectoral Composition of Foreign Capital Inflow to India Rs. Cr. (US$ Million)

Sr. No.	**Sector**	**2011-12**	**2012-13**	**2013-14** (Apr to June, '13)	**Cumulative Inflows** (April 2000-June 2013)	**% to total**
1.	Services Sector **	24,656 (5,216)	26,306 (4,833)	5,319 (945)	177,595 (38,180)	19 %
2.	Construction: Township, Housing, Built-up Infrastructure	15,236 (3,141)	7,248 (1,332)	946 (167)	101,995 (22,248)	11 %
3.	Telecommunications (radio paging, cellular mobile, basic telephone services)	9,012 (1,997)	1,654 (304)	54 (10)	58,786 (12,866)	7 %
4.	Computer Software & Hardware	3,804 (796)	2,656 (486)	984 (171)	53,758 (11,738)	6 %
5.	Drugs & Pharmaceuticals	14,605 (3,232)	6,011 (1,123)	5,442 (1,000)	54,322 (11,318)	6 %
6.	Chemicals (other than Fertilizers)	18,422 (4,041)	1,596 (292)	623 (112)	41,118 (8,993)	5 %
7.	Automobile Industry	4,347 (923)	8,384 (1,537)	2,845 (515)	42,015 (8,810)	4 %
8.	Power	7,678 (1,652)	2,923 (536)	669 (120)	36,805 (7,954)	4 %
9.	Metallurgical Industries	8,348 (1,786)	7,878 (1,466)	634 (114)	35,448 (7,621)	4 %
10	Hotel & Tourism	4,754 (993)	17,777 (3,259)	559 (101)	33,819 (6,732)	3 %

Note: (i)** Services sector includes Financial, Banking, Insurance, Non-Financial / Business, Outsourcing, R&D, Courier, Tech. Testing and Analysis

(ii) FDI sectoral data has been revalidated / reconciled in line with the RBI, which reflects minor changes in FDI figures (increase/decrease) as compared to the earlier published sectoral data.

In addition to the level and composition of capital inflow presented in Table 1.1, we highlight that India is the largest recipient of migrant remittances. It has been argued before (Kar and Guha-Khasnobis, 2006) that higher levels of skill formation juxtaposed with lack of opportunities in the industrial and related sectors in the country leads to significant emigration of skilled and semi-skilled workers from India. A sizable section of these emigrants find jobs in the Middle-East and generates the main source of inward remittances for India presently reported at US$ 65 bn. (International Financial Statistics, IMF, 2012). It is an integral part of the financial system that capital inflow can reduce the cost of capital and

thereby increase growth rate in the real sector [see for example, Giannetti *et al*. (2002), Hartman, Maddalani and Mangalleni (2003) and Bagella, Becchetti and Hasan (2004) on the growth enhancing effect on the GDP]. We accommodate the varying trajectories of labor and capital as discussed above, in the following empirical structure relating economic growth, demographic changes and the financial depth of India.

2. Demography and Growth: A Macro-econometric Model

2.1 The Framework

This section develops a macro-econometric model for India to explain the interactions between demographic changes, development of financial system and international capital inflow. In the tradition of the macro-econometric modeling, following the influential work of Sims (1980), we build up the model in a time series vector autoregression (VAR) framework.[2] The variables of interest in this model are *dependency ratio, financial depth, real interest rate prevailing in India and international capital flow to India*. The variables are defined as:

DR = Dependency ratio = 100-[Population ages 15-64 (% of total)] (vide IMF 2006)

FD = Financial depth = [Bank deposits + Stock Market capitalization] / Previous year's GDP

r = Interest rate = Bank interest rate on lending adjusted for inflation,

FLOW = Capital inflow = [Foreign Direct Investment + Foreign Institutional Investment + NRI Investment] / GDP

Data for dependency ratio is available from the World Bank (2012). Financial depth has been variously defined (see Levine, 2004) and we have used an alternative definition of financial depth, in conformity with the financial system in India. It is defined as the bank deposits or

[2] Later works in this area are Kehoe (2006), Lutkepohl and Kratzig (2004), Stock and Watson (2001).

private credit with or without market capitalization as proportion of previous year's GDP. However, the financial system outside the organized segment is not covered by this definition and neither is there any systematic financial data for units belonging to the unorganized sector. For interest rate, on the other hand, we consider the government securities rate, which is a reasonable indicator of the short-run interest rate in the economy. The data runs from 1980-81 to 2011-12, a total of 32 annual data points per series. The unavailability of some of the crucial indicators, such as insurance penetration for longer time horizons (or quarterly data for shorter horizons) restricts our analysis to some extent. Moreover, data for the population changes, age profile, and work force/hours of work etc. are not available at all.

2.2 Descriptive Analysis

Figures 2.1 through 2.3 provide the yearly movements of the variables used in the econometric analysis. It is evident from Fig. 2.1 that the financial depth (as defined) has increased substantially over the years. There is a *level change* in financial depth in the early 1990s, then another in 2003 with a higher trend till 2007-08. Since 2007-08, however, the financial depth shows a declining trend mainly owing to the fall in market capitalization in the aftermath of global crisis when the value of shares declined, globally. However, when we use an alternative measure of financial depth, namely, bank deposit to last year's GDP, it does not show a declining trend. Needless to mention, the improvement in financial depth came about because of the large-scale reforms in the financial sector initiated since 1991. The improvement in the financial depth is subsequently expected to reduce the extent of financial repression in the economy. This is also reflected in the observed fall in real interest rate (Fig. 2.2).

Fig. 2.1. Financial Depth

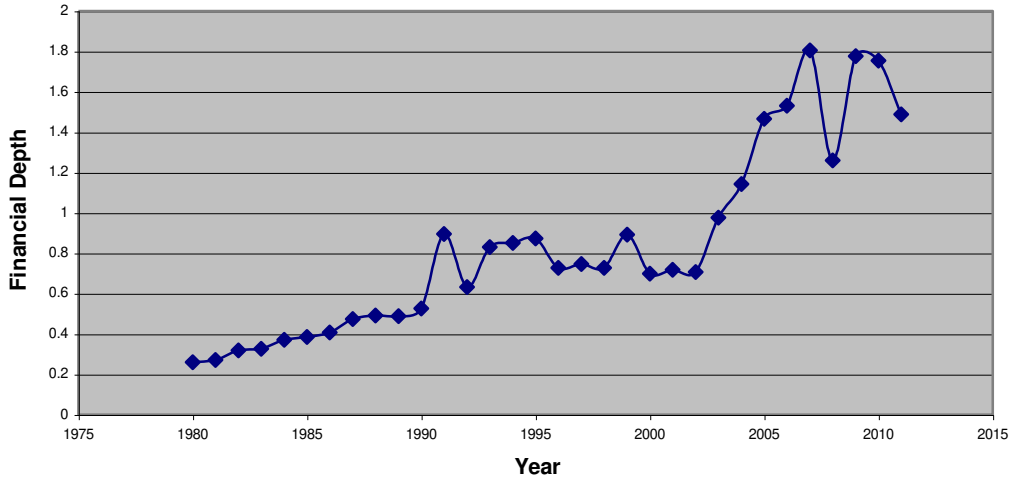


Fig. 2.2. Real interest rate

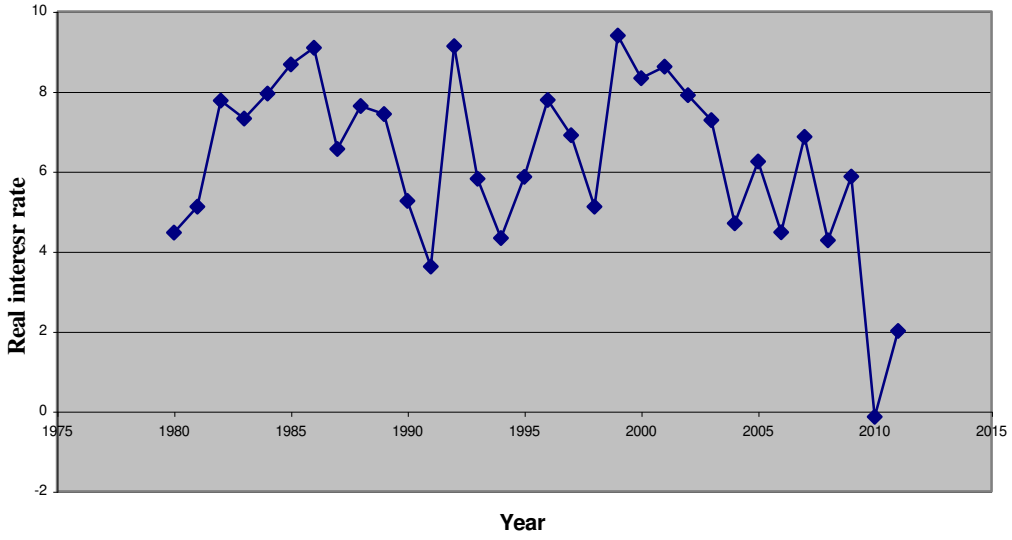
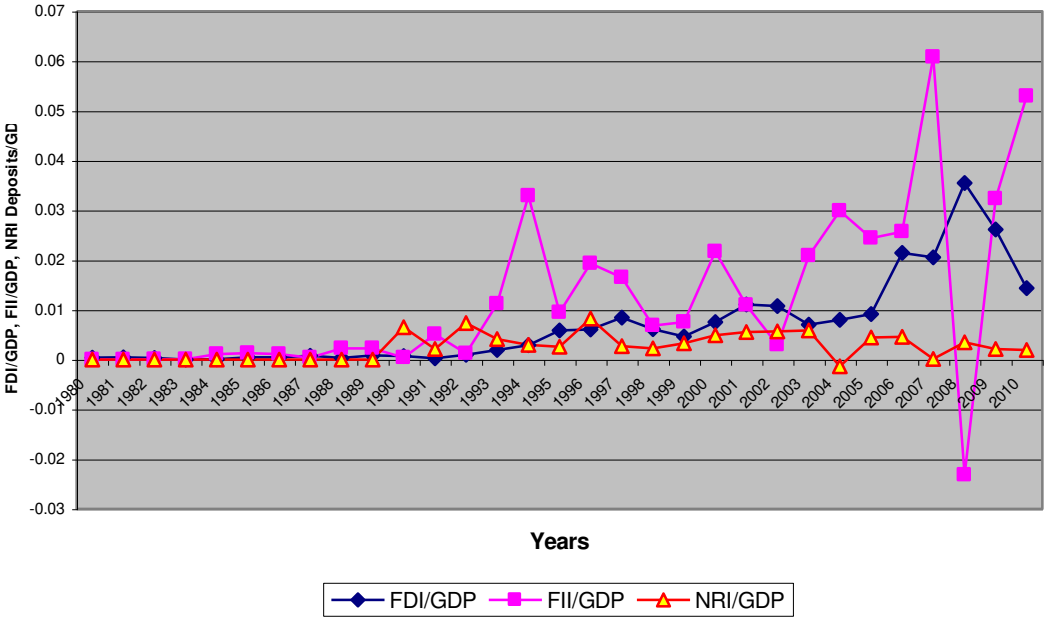


Fig 2.3: Share of FDI, FII and NRI Deposits in GDP



The third variable, namely, the inflow of international capital to India has three major components. Of these, the NRI deposits were allowed only since 1991. Fig. 2.3 provides the movements of the three components as proportion of GDP over the years. Fig. 2.1 shows increasing trends for the Foreign Institutional Investments (FII), which is more volatile in nature owing to high sensitivity to short-run capital gains.[3] In fact, the monthly movements of the FII reveal sharper volatility. FDI had a constant flow until 2004, following which it showed a rising trend that started declining since 2008.

Table 2.1a provides the descriptive statistics for the full sample period, while Table 2.1b provides the same for the post-reform period. The mean values for dependency ratio or interest rate are not different across the full sample period and the post-reform sub-periods. However, the mean values of financial depth and capital inflow are higher for the post-reform period.

[3] Although, there is lack of evidence, but the operators in this market hint that FII periodically flows in, but as the time to pay dividends to the shareholders approaches, they readily flow out of the country.

Table 2.1a Descriptive Statistics (Full Sample)

Variable	Mean	SD	Skewness	Kurtosis
DR	66.58	6.92	-0.31479	1.74
FD	0.84	0.463	0.2143	0.7772
r	6.306	2.16	-0.8886	3.823
FLOW	0.02315	0.0231	0.9658	3.001

Table 2.1b Descriptive Statistics (Post Reform Period)

Variable	Mean	SD	Skewness	Kurtosis
DR	62.36	5.1568	-0.00042	1.7119
FD	1.08	0.4103	0.65118	1.8766
R	6.043	2.3836	-0.82645	3.5428
FLOW	0.0357	0.02076	0.7957	2.5756

We begin by presenting a robust OLS estimate for two crucial relations. First, we consider the relationship between aggregate growth rate and dependency ratio. This is followed by the relationship between aggregate growth rate and financial development. Table 2.2 reports the preliminary regression results between growth rate of GDP (at factor cost and at constant 2004-05 prices) and the other two variables for the period 1980-81 to 2011-12. Since all three variables are found to be stationary, the statistical relations are meaningful in the sense of time series regression.[4] We report the regression results both for the current value and lagged values of the two regressors. Growth rate has a significant relation both with dependency ratio (negative) and financial development (positive). The relations are statistically significant (at 1% level) and of the same sign both for the current and the lagged values of the respective variables. However, we did not find any significant relation between growth rate and interest rate. The results suggest that a meaningful econometric relation including causal relations between dependency ratio, financial depth, interest rate and capital

[4] Stationarity of dependency ratio is discussed later. ADF test for growth rate of GDP is found to reject the null hypothesis of stationarity.

inflow will have direct bearings on the growth rate of the economy.

Table 2.2. Regression of growth rate on Dependency Ratio and Financial Development (current and one year lag)

	Dependency Ratio (A)		Financial Development (B)	
	DR (1)	DR (-1) (2)	FD (3)	FD (-1) (4)
Coeff (t-value)	-0.14** (-3.12)	-0.16** (-3.38)	2.59** (4.53)	2.56** (3.31)
R^2	0.23	0.27	0.30	0.28

Note: We did not report the estimate of constant.

2.3 Stationary Properties of the Data Series

Next we check for the stationary properties of the data. Table 2.3 provides the relevant test results. Graphical plot of the data series for the four variables shows that except for dependency ratio (Fig. 1.2) other series report one or more structural breaks. Hence, we employed the Bai-Perron Test (Bai and Perron, 2003), which is the appropriate test when the number of breaks and the exact time of occurrence are both unknown.[5] Except for the dependency ratio, the null hypothesis of structural breaks is not rejected for the other three variables.[6] Owing to the presence of multiple structural breaks in the series the Dickey-Fuller or the Augmented-Dickey-Fuller (ADF) Tests are not appropriate for testing for unit root or non-stationarity in general. Instead, the BLS Test (Banerjee, Lumsdaine and Stock, 1992) is the appropriate test statistic, which provides inference on non-stationarity of the time series data independent of the presence of break points. Further, among the three tests of BLS variety we reported the sequential *F-Test*. Table 2.3 provides results of unit root tests for both

[5] For sake of brevity we did not report Bai-Perron Test results here, which are available on request.
[6] We deployed Bai-Perron Test for 3 to 4 break points.

ADF and BLS test statistics. The table points out that the null hypothesis of unit root is rejected by both BLS and ADF in all the cases, albeit the later test does not reject the null hypothesis for financial depth. Overall, given the superiority of BLS test we rejected the presence of non-stationarity in the series.

Table 2.3 Stationary Properties of the Variables

Variable	Augmented Dickey-Fuller Test	Banerjee-Lumsdaine-Stock Sequential F-test
DR	-8.939*	5924122.83*
FD	-3.115	74.00*
R	-3.948**	6.52*
FLOW	-5.653*	27.83*

Note: * and **stand respectively for significance at 1% and 5% levels.

2.4 Econometric Specification and Estimation Results

The macro-econometric model is specified in terms of the four variables as follows:

$$Ay_t = A_o + A_1 y_{t-1} + A_2 y_{t-2} + ... + A_p y_{t-p} + \beta x_t + \varepsilon_t \qquad (2.1)$$

where, $y_t = (DR_t \;\; FD_t \;\; r_t \;\; FLOW_t)'$, A = matrix of contemporaneous coefficients, A_0 = vector of constants of order 4x1, A_i = matrix of coefficients of the lagged variables, *i=1,...,p,* each of order 4x4, β = vector of coefficients for the exogenous variables, and x_t = vector of exogenous variables. ε_t is the vector of disturbances for the set of structural equations and $E(\varepsilon_t \varepsilon_t') = B$, variance-covariance matrix of the structural shocks.

$$y_t = A^{-1}\left(A_o + A_1 y_{t-1} + A_2 y_{t-2} + ... + A_p y_{t-p} + \beta x_t\right) + + A^{-1}\varepsilon_t$$
$$= \Pi_o + \Pi_1 y_{t-1} + \Pi_2 y_{t-2} + ... + \Pi_p y_{t-p} + \tilde{\beta} x_t + u_t$$

where, Π_j s i=1….,p, are reduced form parameter vector/ matrices and $\tilde{\beta}$ is the vector of reduced form parameter vector / matrices of exogenous variables. The relationship between reduced form disturbances and the corresponding variance-covariance matrix are given by

$$u_t = A^{-1}\varepsilon_t$$
$$E(u_t u_t^{'}) = \Sigma_u = A^{-1}BA^{-1^{'}}$$

The VAR is estimated in reduced form and then structural form parameters are obtained via identification conditions. The estimated reduced form VAR is reported below in Table 2.4. A two lag structure was found to be appropriate. We checked with the roots of the estimated VAR and found that all the eigenvalues lie inside the unit circle. This confirms the stability of the estimated VAR model. We also included time as an exogenous variable. Dependency ratio has the expected negative time trend. The time trend in the equations for interest rate and capital inflow are also negative with high absolute value for the coefficient of interest rate. There is, however, a dilemma in this context. Financial development reduces the interest rate, which in turn is expected to raise domestic investment. Since, international capital inflow is considered to supplement inadequate domestic investment a reduction in interest rate reduces capital inflow and creates a tension.

In addition, we test for Granger causality (Table 2.5). The null hypothesis is that the estimated coefficients of lagged values of the other endogenous variables are jointly zero. The relevant test statistic is Wald Statistics. Except for the cases of capital inflow to dependency ratio, and financial depth to interest rate, the null hypothesis of *no (Granger) causality* is rejected at 5% level (at 1% level for others). The result that capital inflow does

not Granger cause dependency ratio appeals to conventional wisdom. But, the result that *financial development does not Granger cause interest rate* is interesting in the context of this paper. This means that there are even stronger factors that affect the interest rate compared to the level of financial development as measured by financial depth in our model.

Table 2.4 VAR Estimation Results

Variable→ Lag↓	DR	FD	r	FLOW
DR(-1)	1.916**	-0.623	-13.101**	-0.081**
DR(-2)	-0.940**	0.538	12.589**	0.075**
FD(-1)	0.056**	0.528*	0.75	0.027*
FD(-2)	0.008	0.674**	1.765	0.055**
r(-1)	0.004**	-0.032*	0.074	-0.002*
r(-2)	0.005**	0.021	0.167	0.001
FLOW(-1)	-0.106	-10.194**	-47.949	-0.699**
FLOW(-2)	0.261	-9.511**	24.202	-0.826**
Time	-0.019**	-0.044	-0.81*	-0.004*
RMSE	0.0131	0.1514	1.693	0.01

Note: (1)* implies significant at 5% ** at 1%.
(2) Log likelihood = 171.72, SBIC = -6.913, Det (Sigma_ML) = 1.25e-10, N = 30.

Finally, we estimate the structural model to find the nature of contemporaneous relations among the endogenous variables. For this, we imposed short-run restrictions for identification. Defining matrix *B* as structural innovations, one can justifiably assume zero covariance between the four innovations; the principal diagonal of matrix *A* is unity for normalization; the rest of the constraints are exclusion conditions on the coefficients of *A* and are estimated. After several trial and errors we found the appropriate structural form model as described by the estimated *A* matrix and *B* matrix given below. *, ** denote statistical significance at 5% and 1%, respectively.

Table 2.5. Granger Causality (Wald Test)

Equation	Excluded	χ^2 Test statistic	df
DR	FD	7.842*	2
	r	18.79**	2
	FLOW	1.534	2
	All	19.36**	6
FD	DR	6.385*	2
	r	6.436*	2
	FLOW	18.19**	2
	All	24.41**	6
r	DR	7.907*	2
	FD	0.5968	2
	FLOW	3.96*	2
	All	20.78**	6
FLOW	DR	10.768**	2
	FD	18.14**	2
	r	8.348*	2
	All	34.434**	

Note: * implies significant at 5% and ** significant at 1%

Identification matrix

$$A = \begin{bmatrix} 1 & -0.6445^{**} & -0.00669^{**} & 0 \\ 0 & 1 & 0 & 0 \\ 0 & 3.9994^{*} & 1 & 0 \\ -0.19736^{*} & 0 & 0 & 1 \end{bmatrix}$$

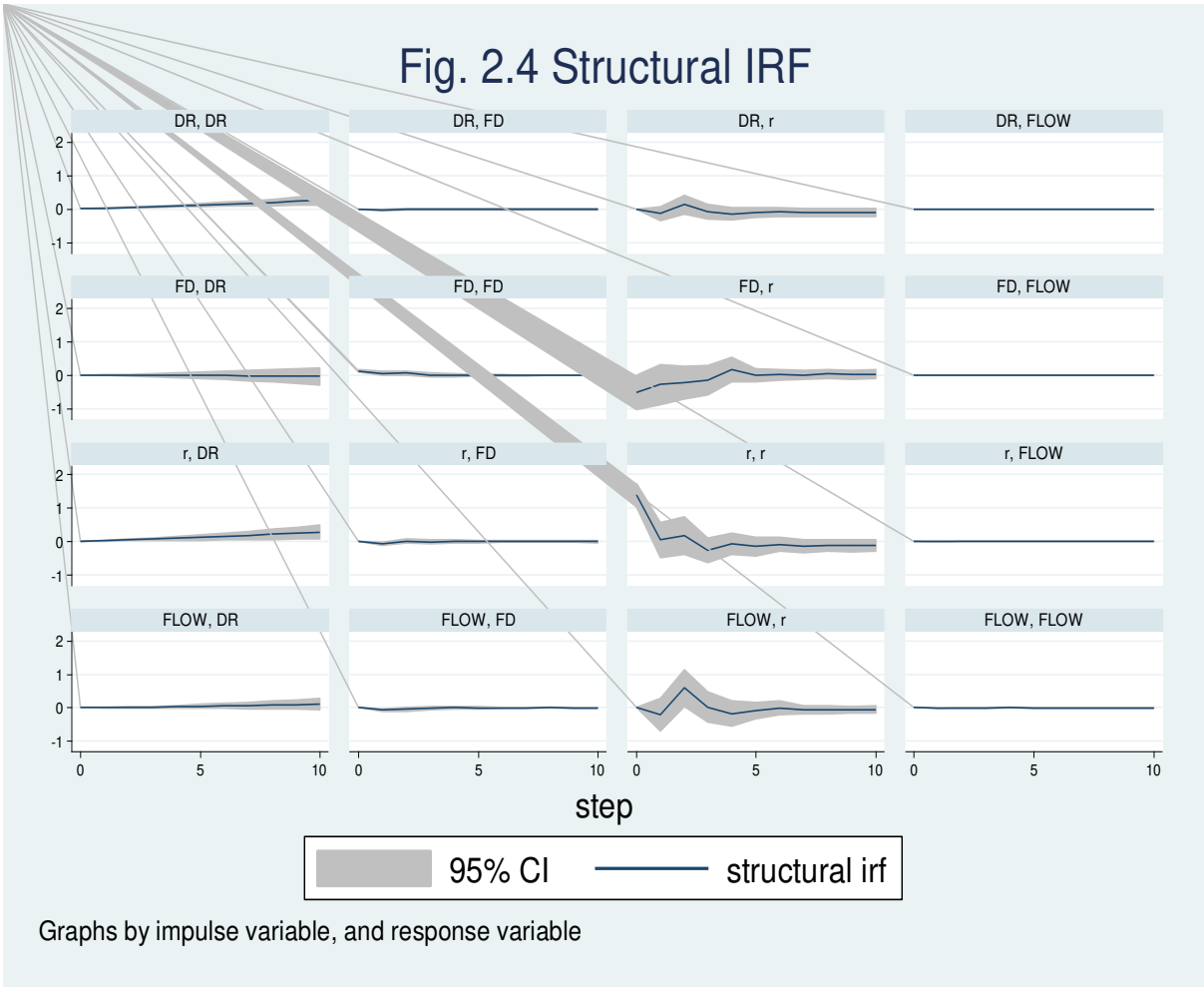
$$B = \begin{bmatrix} 0.1362^{**} & 0 & 0 & 0 \\ 0 & 0.112713^{**} & 0 & 0 \\ 0 & 0 & 1.3972^{**} & 0 \\ 0 & 0 & 0 & 0.00808^{**} \end{bmatrix}$$

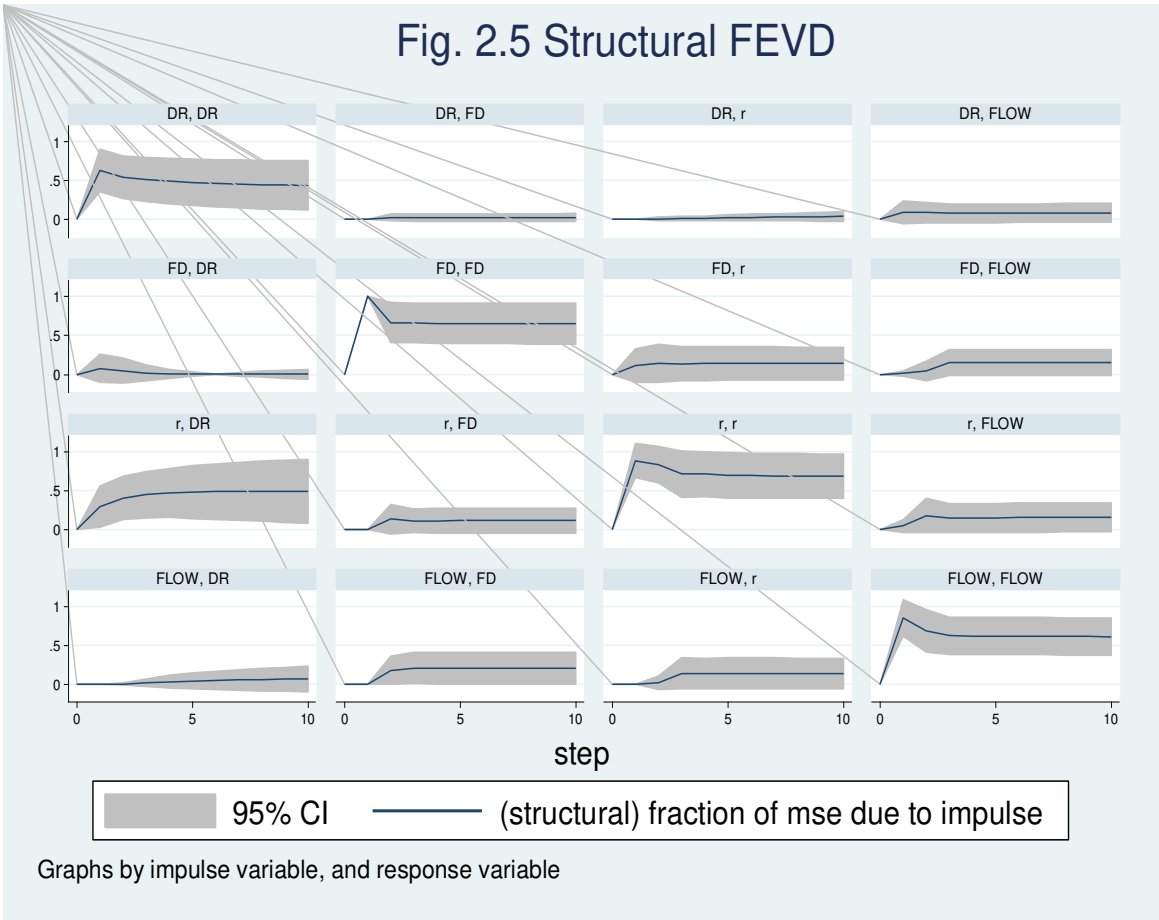
Our structural VAR model is over-identified with two more restrictions than are needed for identification. This version of the model is finally found to be the best in terms of several measures of goodness of fit. The LR test of over identifying restriction is not rejected at 5% (or even at 10%) level with a χ^2 value of 3.615 with df 2 and the probability, 0.164.

It follows that the Dependency ratio is positively related to interest rate and financial depth. Interest rate is negatively related to financial depth – a confirmation of the fact that financial development and interest rate move in opposite direction, contemporaneously. On the other hand, the Dependency ratio and capital inflow move together in contemporaneous time.

These allow us to plot the Structural Impulse Response Functions (SIRF) and Structural Forecast Error Variance Decomposition (SFEVD) for a horizon of 10 years in Figs. 2.4 and 2.5 respectively. Fig. 2.4 shows that a shock to dependency ratio marginally reduces interest rate, which then rises but eventually converges to the earlier level. On the other hand, the impact of a structural shock to *financial depth* has greater impact in reducing interest rate in the current period and the effect takes around five years to die down. Shock to *capital inflow* has a negative impact on interest rate after two years, rises beyond it and eventually converges to the initial equilibrium level from fifth year onwards. SIRFs in other cases report *no impact*. The panel for error variance decomposition together with SIRF and coefficients of the A matrix reveal that *FD* is exogenous in contemporaneous time. In other words, financial depth is not affected by the other contemporaneous variables. This is in conformity with its

role as a policy variable, which is shaped by policy interventions from the government and other regulatory agencies, such as Reserve Bank of India. Our results largely subscribe to the findings in Monnet and Quintin (2007), which suggest that financial system architecture of any country at any point of time is the outcome of policy interventions in historical episodes. In a way, our results differ from Thakor and Song (2010) that built up the case for co-movement of different segments of the financial system, with banks preceding the stock market because of its efficiency in mitigating project risks in the early phase of growth.





The estimated econometric model establishes the roles of *dependency ratio, financial development and the interest rate* channel on capital inflow. However, the rate of capital inflow is not very encouraging compared to other emerging market economies, particularly China and other East Asian countries, which are already going through the second phase of demographic transition. The capital inflow to GDP ratio is 3.57% in the post reform period with a very high degree of volatility. The source of volatility comes from a portfolio investment component, which we have discussed as a significant source. Consequently, a slight underperformance of the economy or rumors about policy shifts quickly manifests into herd behavior among investors. Notwithstanding, these observations on the aggregate macro-

econometric model fail to reveal adequate levels of intricate information on how the economy adjusts to demographic transitions.

In the case of growth and development driven by demography, as we have suggested in the introduction, the rate of investment has to increase to an unprecedented level, particularly when a country enters or is due to enter the second phase of demographic window. This shall enhance the rate of capital formation to permanently raise the labor productivity (Albrieu and Fanelli, 2012, Mason and Lee, 2006, 2011 in general and Ladusingh and Narayana, 2011 for India, in particular). The experiences with recent development saga in East Asia hint that a rate of investment exceeding 40% is warranted so that India may reap the benefits of the second demographic dividend. However, in contrast to the well-known two-gap model, it seems that there may be stark inadequacy of international capital flows. This prompts us to look into the *domestic savings and investment* as the more feasible alternatives. In addition, the abundant stock of domestic investment sets a congenial atmosphere for international capital to flow in. We have used two measures of financial depth, namely, (i) ratio of bank deposits to previous period's GDP, and (ii) ratio of bank deposits plus market capitalization to previous period's GDP. These variables are plotted in Fig. 2.6 over 1980-81 to 2011-12, which shows that the financial depth is positively related to both the rate of saving as well as, investment. The positive relation is more consistent when financial depth is measured in terms of bank deposits only. Since the year 1999-00, all the three variables show rising trends against time. When financial depth is measured by including market capitalization, its relationship with saving or investment fluctuate more than the other measure. After 2003-04, the financial depth inclusive of market capitalization follows a marked departure from earlier trend for a few years until the onset of global

financial crisis. During this period, the trend path of saving or investment does not show any change.

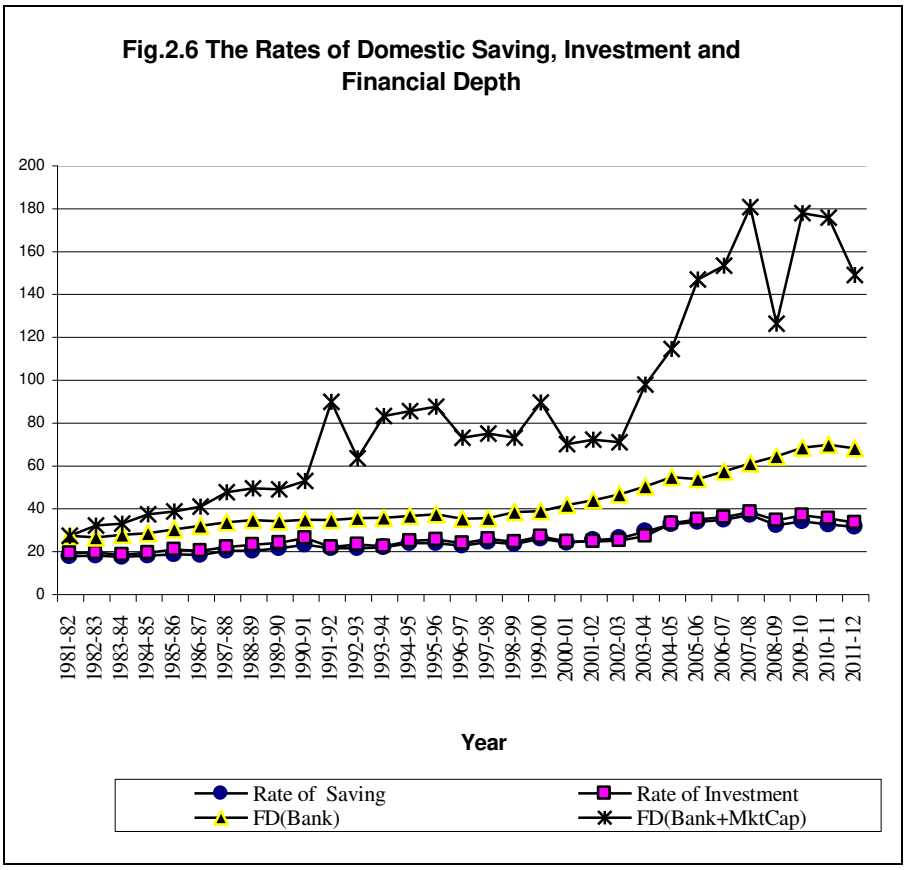


Table 2.6 engages in a detailed analysis of how the scope and returns from investment have responded over the period under consideration. Table 2.6 reports that the interest rates including 10 year yield to maturity of government securities show declining trends. In India, the return on capital market instruments is measured by two indices – BSE-SENSEX and BSE-100 Index. The first one is the most widely used though its coverage is small (only a 30-scrip index). Hence, returns on an index with larger coverage (100 scrip index) are also reported. Index values realized show high annual returns until 2007-08. However, this is due to more secondary market rather than the primary market, transactions, which is a

manifestation of speculative activities. After 2007-08, when the capital markets crashed globally, the index return in India too declined by 40% within a year.

Table 2.6: Overall Financial Indicators

Indicator	**1991-92**	**1994-95**	**1999-2000**	**2006-07**	**2011-12**
Return on govt. securities (% pa)	11.46	12.58	10.17	7.64	8.45
Bank deposit rate (% pa)	9.5	10	9.25	8	8.88
Bank lending rate (% pa)	16	15	13	10.75	10.75
Return on BSE-SENSEX (% pa)	81.22	33.26	40.78	45.89	-6.40
Return on BSE-100 Index (% pa)	68.54	33.74	56.99	40.16	-7.52
Market capitalization – All India (Rs. Billion)	908.36	4354.81	9128.42	35450.4	62095.35
Total no. of new share issues	366	1591	69	114	49
Total no. of new debenture issues	145	121	10	3	0
Total value of new share issues (Rs. Billion)	19.16	118.77	27.53	297.56	81.56
Total value of new debenture issues (Rs. Billion)	42.75	88.71	24.01	8.47	0.00

Source: Handbook of Statistics on Indian Economy, Reserve Bank of India (various years), And Prowess, CMIE.

Note: (i) Return on Govt. securities is measured by yield to maturity of 10 year govt. securities.
(ii) Return on BSE-SENSEX and BSE-100 indices are calculated on the basis of annual average index value over months (Apr.-Mar.).

Recent growth in India, especially during the reform period has come about due to a very high growth in the service sector of which financial services comprising of the banking, and insurance command larger contributions. The growth in value added has been very high, although growth in employment has been rather low. The countries that are old in the path of demographic transition, such as the US, Germany, the UK, Japan and the relatively younger countries (but still older than India in the path of demographic dividend), such as China and other East Asian economies, all have much lower share in services. For India, the growth of service sector entails growth of self-employment and growth of employment in the construction sector with low level of earnings. Note that, these would automatically suggest that India has not been the biggest beneficiary of the demographic dividend, typically because activities such as low quality self-employment practices and the involvement in construction

and allied activities account for low level of productivity leading to poor levels of saving and capital accumulation. In other words, the benefits of the second demographic dividend are unlikely, without major policy interventions from the government. The dependence on foreign capital for fostering investments and growth implies increased exposure to speculative attacks and risk of economic turmoil that characterized the East Asian crisis.

Historically speaking, following the 'take-off' the main source of growth in India has come from growth of total factor productivity. Higher growth has come more from physical capital per worker, more human capital per worker and higher total factor productivity. Although the growth of employment in the industries (registered sector) in India is same as that in other Asian countries, growth in value added has been much less. Productivity of Indian industry has been generally low. Further, inadequate investment in infrastructure has led to deceleration of the industries dependent on the infrastructure. Important infrastructure related inputs to industry, including power have been dismal (40% of all households in India are still without regularized power supply) and neither the private sector nor large public investments in the power sector came up to meet this deficiency. It has been argued that the poor infrastructure facilities hinder growth of private entrepreneurship and accounts for poor performance of the economy in general. In this connection, the depth of the unorganized sector should be considered as a disadvantage rather than advantage if India must engage its younger labor force to more productive activities. We suggest that the demographic dividend with large number of workers entering the work force is in fact contributing to the growth, although in the behest of the unorganized sector. Since the formal industrial sector does not employ significantly and the service sector, where all growth is accumulated in recent times, jointly characterize India as the land of jobless growth, it is not expected that the demographic dividends shall accrue in full. The unorganized sector might be lending an

invisible support (the government reports clearly acknowledges it without quantifying the formal-informal link, unlike here) to this process, albeit incapable of achieving the demographic dividend.

3. Capital Inflow and the Formal-Informal Production Linkages

From the year 2000 inflow of FDI has been promoted hugely in India, including permission for 100% share with automatic approval in most sectors like, textiles, paper, chemicals, drugs and pharmaceuticals, rubber and plastic, non-metallic mineral products, metal products, machinery and equipment and automobiles. Notably, all these products have parallel production in the unorganized sector creating scope for outsourcing. We measure effects of organized wages, technology and FDI flowing into the formal sector, on the gross value added (GVA) of the unorganized firms. We find that FDI coming into the organized sector results in a higher GVA of the unorganized sector. We also try to find a transmission mechanism through which FDI affects informal sector. Section 3.1 discusses the data and variables, section 3.2 the econometric specification and section 3.3 the results. Section 3.4 offers an overview for this section. Table 3.1 depicts the degree and range of activities in the unorganized sector as per Census of India (2011).

Table 3.1. *Table Showing Labor Input in the Unorganized Sector*

Share of Labour Input in unorganized Sector (%)	
	2004-05
Tabulation category/Description	Share of Unorganised Sector
A: Agriculture and forestry	99.9
B: Fishing	98.7
C: Mining	64.4
D: Manufacturing	87.7
E: Electricity, Gas, Watersupply	12.4
F: Construction	92.4
G: Wholesale and Retail Trade,	98.3
H: Hotel & Restaurants	96.7
I: Transport, Storage & Communication	82.2

Source: Report of the Committee on Unorganized Statistics, MOSPI, 2012

3.1 Data Sources

Annual data (2000-01 and 2005-06) for the organized sector is obtained from Annual Survey of Industries (ASI) and that of the unorganized sector (2000-01 and 2005-06) from National Sample Survey Organization (NSSO)[7]. Annual data (1998, 1999, 2003 and 2004) for Foreign Direct Investment is taken from the Department of Industrial Policy and Promotion, Government of India. Our main objectives are to find whether formal firms in India outsource to the unorganized sector and to subsequently test if technology in the unorganized sector interacts with FDI in the organized sector to raise GVA of the unorganized firms.

[7] The choice of years for industry data is restricted by availability of recent data for unorganized sector industries. NSSO uses the term Fixed Assets to imply Fixed Capital stock as in ASI.

Proposition 1: *With low growth of employment in the formal industrial sector and in the service sector, the larger employment growth is confined to the informal sector leading to partial benefits from the expected demographic dividend.*

Proof: We derive the relations below.

The Choice of Variables

We consider gross value added (GVA_i), the fixed assets (FA_i), wages ($wage_i$) and the technology ($Tech_i$), i defining the organized sector (OR) and the unorganized (UN) sector. These variables are characterized by standard definitions. We also consider the volume of FDI coming into the organized manufacturing industries as explanatory variables. Corresponding to the year 2000-01, we consider the volume of FDI inflow in the years 1998, 1999 and corresponding to the year 2005-06, we consider the volume of FDI inflow in the years 2003 and 2004. This is because FDI is less likely to have effect on the industry parameters instantly. FDI has three components, viz., equity capital, reinvested earnings, and intra company loans.[8] FDI flowing into the industries one year ago (FDI_{-1}) and two years ago (FDI_{-2}) is studied. Following Tybout (1997) and Bhaumik *et. al.* (2006), we used the capital-labor ratio as a proxy for technology.

3.2 Econometric Specification and Results

We use a generalized least square (GLS) estimation technique to account for heteroscadasticity in the data and autocorrelation in the data for FDI. We have converted all the nominal variables of 2000-01 to real variables by deflating them with the wholesale price

[8] Earlier data on FDI in India included only cash acquisition of equity and preference capital; later on it follows standard IMF definition (GoI, 2002).

index of 2000-01 and the variables of 2005-06 by deflating them with the wholesale price index of 2005-06.[9] We also control for industry specific AR(1) in the data.

The model that we estimate is:

$$GVA_{UN} = \alpha + \beta_1 GVA_{OR} + \beta_2 Wage_{UN} + \beta_3 Wage_{OR} + \beta_4 FA_{UN} + \beta_5 FA_{OR} + \beta_6 Tech_{UN} + \beta_7 Tech_{OR} + \gamma_1 FDI(-1) + \gamma_2 FDI(-2) + \delta_1 Tech_{US} * FDI(-1) + \delta_2 Tech_{US} * FDI(-2) + \varepsilon_{it} \quad (3.1)$$

The interaction term plays a critical role. It shows how GVA_{UN} changes due to *FDI* inflow in organized sector via technology transmission in addition to a direct effect. Therefore the total effect of FDI on unorganized sectors' value added is an outcome of the comparison between the direction and magnitudes of (γ_i, δ_i) in (4).

$$\frac{\delta Y_{it}}{\delta L_{it}} = \gamma_i + \delta_i * Tech_{UN} \quad (3.2)$$

Proposition 2: *FDI(-1) and FDI(-2) increases GVA_{UN}, although the positive impact of capital spillover falls with passage of time.*

Proof: The results of the *GLS* regression are presented in table 3.2. First, a one-unit increase in the GVA_{OR} significantly raises the GVA_{UN} at 1% level of significance. This shows that as formal firms' valued added increase, the value added of the informal firms increases as well. Rise in FA_{OR} reduces GVA_{UN} significantly, i.e., higher the FA_{OR} lower is the volume of jobs that the organized firms outsource. Within the unorganized sector, a one-unit rise in *FA* increases GVA_{UN} significantly. But, an increase in real wages in the unorganized sector by one-unit reduces the GVA_{UN} significantly, whereas a rise in real $Wage_{OR}$ increases GVA_{UN}.

[9] The base year of wholesale price index of both the years is the same.

This conforms to common perception that rising labor costs leads to production outsourcing. An improvement in the technology used in organized sector reduces GVA_{UN} significantly, whereas an improvement in the technology of unorganized sector raises its GVA. More importantly, both FDI_{-1} and FDI_{-2} increases GVA_{UN}, although the positive impact of capital spillover dampens over time.

The interaction term plays a critical role and provides direction of the transmission mechanism by which FDI in organized sector affects GVA_{UN} via outsourcing. The interaction terms show that a one-unit increase in *FDI* raises GVA_{UN} significantly through technology transfers. In other words, as *FDI* flows into the organized sector, these firms outsource a portion of their production to the unorganized sector along with technology inputs. This can take the form of more advanced and efficient equipments and production designs as anticipated by NCEUS (2009). The rise in GVA_{UN} is a direct outcome of this production outsourcing. The FDI-technology link is directly borne out in our empirical result. Moreover, the coefficient of the interaction terms, unlike that of FDI, increases over time. This might be because it takes time to adapt technology, but once adapted its effect are long term in nature.

Table 3.2. Results of GLS Estimation

Dependent Variable: Unorganized sector gross value added (GVA_{UN})		
Independent variables	Coefficient	Std. Error
GVA_{OR}	0.03*	0.003
FA_{UN}	0.61*	0.005
FA_{OR}	-0.15*	0.003
$Wage_{UN}$	-0.53*	0.030
$Wage_{OR}$	0.42*	0.04
$Tech_{UN}$	16.23*	4.3
$Tech_{OR}$	-3.20*	0.56
FDI_{1}	0.19*	0.03
FDI_{2}	0.17*	0.02
$(Tech_{UN})*FDI_{-1}$	1.67*	0.19
$(Tech_{UN})*FDI_{-2}$	1.92*	0.12
Constant	-17.14**	10.35

Note: * significant at 1%, ** significant at 10%.
Source: Own calculations.

Additionally, we also show that per worker growth rate of emoluments in 11 out of 14 unorganized sector industries (except, *coke, petroleum products and nuclear fuels*, *fabricated metal products and office*, *accounting and computing machinery*) is either negative or less than that in organized sector (Table 3.3). The rise in labor cost, thus, could be a major reason for organized to unorganized production outsourcing, although the net effect may not be conducive to the merits of demographic dividend.

Table 3.3 Growth Rates of Emoluments per Worker in Organized and Unorganized Manufacturing between 2000-01 and 2005-06 (%)

Industry Groups	Organized Sector	Unorganized Sector
Chemicals and chemical products	40	-52
Coke, petroleum products and nuclear fuel	-8	20
Food products and beverages	21	-48
Motor vehicles, trailers and semi-trailers	19	15
Machinery and equipments, n.e.c	26	20
Textiles products	17	-54
Electrical machinery and apparatus, n.e.c	5	-25
Fabricated metal products	18	32
Rubber and plastic products	27	5
Paper and paper products	29	-65
Medical, precision and optical instruments	21	5
Leather and related products	22	-26
Office, accounting and computing machinery	25	39
Wood and wood products	56	-83

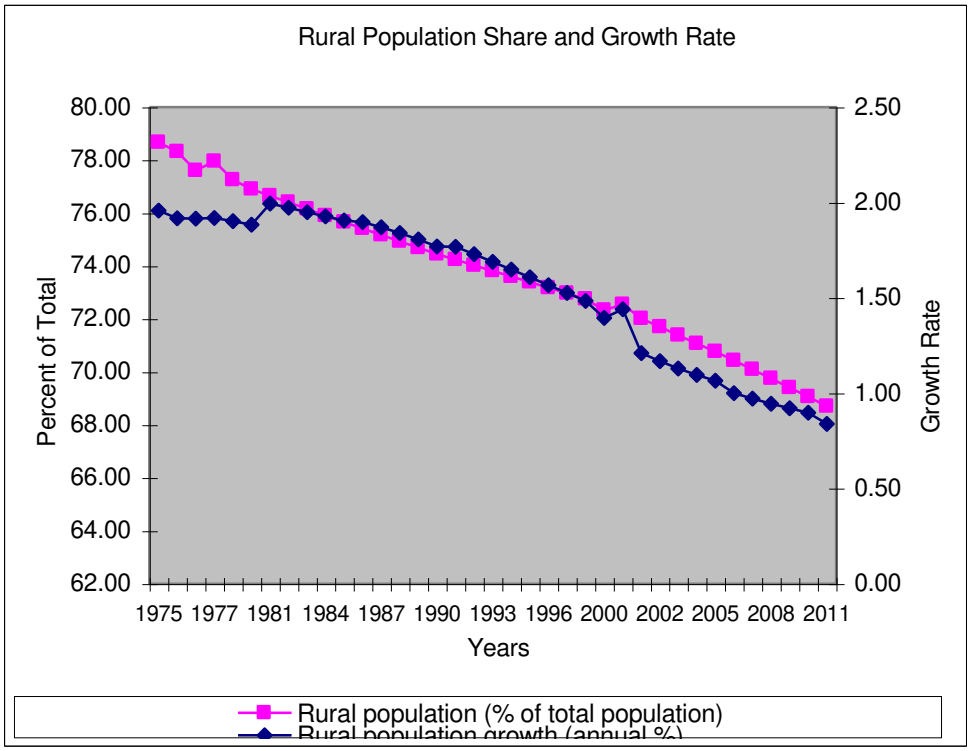
Note: n.e.c = not elsewhere classified, *Source:* Own calculations.

3.3 The Rural Sector and Demographic Dividends in India

Notwithstanding, the prospects of demographic dividends in India could get even weaker unless the large rural sector is rapidly accommodated in the demography-financial sector-growth matrix. India, like many other developing and emerging economies still have a fair share of the population living in the rural areas with limited and uneven growth experiences as compared to the country as a whole. This implies that while the growing urban areas in India benefited significantly from the growth and development impetus following the regime shift in economic policies in the country, the rural areas did not catch up at the socially desirable level. The financial deepening and the outreach of development outcomes have often been dismal for rural growth trajectories over a significant phase in the recent history. It remains however, that the rural areas have supplied disproportionately more

population growth for the country and might be the continued source of rural-urban migration. This sub-section shows that the financial markets and institutions in major states and union territories (federally administered regions) are yet to link the predominantly agrarian rural economy to the larger growth and development issues. The consequences of this neglect are many. First, since the financial deepening in the rural areas is fairly low, one has to relocate the debate on rural-urban financial links in emerging economies back to the rural-urban migration patterns, still. Note that, the rural population share is as high as 68% of the total population of the country. However, as per data available from the Global Development Indicators, World Bank, the population growth rate has mellowed significantly, and presently at 0.84% per annum (Figure 3.1). Clearly, given the immense size of the population, any positive growth rate signifies large addition to the existing population in the countryside. The question is, would this sizable workforce translate successfully into demographic dividends?

Figure 3.1: Rural Population share in Total Population and Annual Growth Rate



Source: World Bank (2012)

The answer as yet seems, no. Glaring lack of access to bank and non-bank financial institutions in the rural and semi-urban areas in India leaves open the scope for spurious and mostly illegal financial organizations that mobilize large amounts of savings (in small per capita amounts) from these locations and get involved into series of Ponzi schemes. The cooperative revolution has not been successful in many parts of the country either, unless it is both unique and productive in nature, such as the Gujarat Milk Cooperative Limited. The technology transfer between the formal and the informal sector as discussed above could then be construed as a possible source by which the productive ensemble of rural workers should be made effective in generating considerable economic outputs. The role of the financial institutions in facilitating such activities should be remarkable in view of the potential returns from investments. Instead, the All India Debt and Investment Survey (AIDIS) by NSSO

reveals that the loans taken from moneylenders in the total credit stock of rural households have increased from 17.5 percent in 1991 to 29.6 percent in 2002. This indicates an increase in indebtedness of rural households over the past decade to informal lending institutions. While this may also mean an increased access to credit, AIDIS (1991) suggest that just 16 percent of rural households had formal loan outstanding. Based on the World Bank-NCAER Rural Financial Access Survey (2003), the corresponding number was 21 percent (Basu, 2006). [10] On the production side, however, Foster and Rosenzweig (2004) previously argued that whenever there has been a productivity increase in the Indian agriculture, the consequently higher rural wage has discouraged rural industrialization. Thus, the supply side effect could not be compensated by greater demand for local goods through the increased income effect.

4. Concluding Remarks

Any attempt to relate the demographic change to financial architecture of a country remains incomplete without adequate emphasis on the activities in the labor market. In India, more than 90% of all labor market activities are confined to the unorganized sector. We developed an econometric exercise in section 3 wherein, we showed that the capital inflow into the formal industrial and service sectors spills over to the unorganized sector. The relation of this exercise to the demographic transition in India is direct. We discussed that the extant economic growth in India has bypassed the formal industrial sector in favor of large contributions from the service sector that does not generate as much employment as the industrial sector is capable of creating. At the same time, the formal industries have

[10] Chattopadhyay (2011) has shown that during the post-reform period bank credit to agriculture has in fact declined which has its negative impact on output.

outsourced a significant amount of production to the unorganized sector in order to lower organizational costs and remain competitive in the face of steep competition from low cost production in East Asia and China. Overall, the unorganized sector seems to have largely accommodated the growing labor force. Notwithstanding, the implications for demographic dividend would still be weak because the low capital and technology intensity in the informal sector keeps the wages low, savings low and the growth rate low. The break-away from this trap is feasible if the large informal labor as well as the rural workforce can be inducted into more productive activities with the help of deep financial intermediation.

This was preceded by a fully laid out VAR model using the dependency ratio, financial depth, rate of interest prevailing in the country and capital flow. We showed that financial development reduces interest rate, which in turn is expected to raise domestic investment. On the other hand, international capital inflow is expected to supplement inadequate domestic investment. A reduction in interest rate raises domestic investment, but reduces capital inflow. In fact, the recent (2013) currency devaluation in India is a byproduct of the large trade deficit coupled with withdrawal of investments from India in view of better prospects in the US, where repeal of public support as announced by the government raised (compared to India) interest rates for attracting fresh investments. Further, the estimated econometric model established the positive role played by *dependency ratio, financial development and the interest rate* affecting capital inflow. However, the rate of capital inflow did not seem very encouraging compared to other emerging market economies, particularly China and other East Asian countries, which are already going through the second phase of demographic transition. Overall, our results suggest that in order to make the best out of the demographic dividends in India, the government needs to design measures to foster entrepreneurship in the formal domain, even if a large number of these turn out to be small

and medium sized ventures. It has been suggested in umpteen numbers of previous works that the bureaucratic controls and corruptions in India have been detrimental to start-up businesses in the formal sector driving a large number of firms in informal activities. Despite possible repetition of apparently inane policies (but, using a recent study which shows that corruption does not raise informality in those states of India where per capita income is higher than a critical level; Dutta, Kar and Roy, 2013), we still suggest that measures to restrain corruption and therefore retaining firms in formal businesses may be an important step towards raising the level of demographic dividends.

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