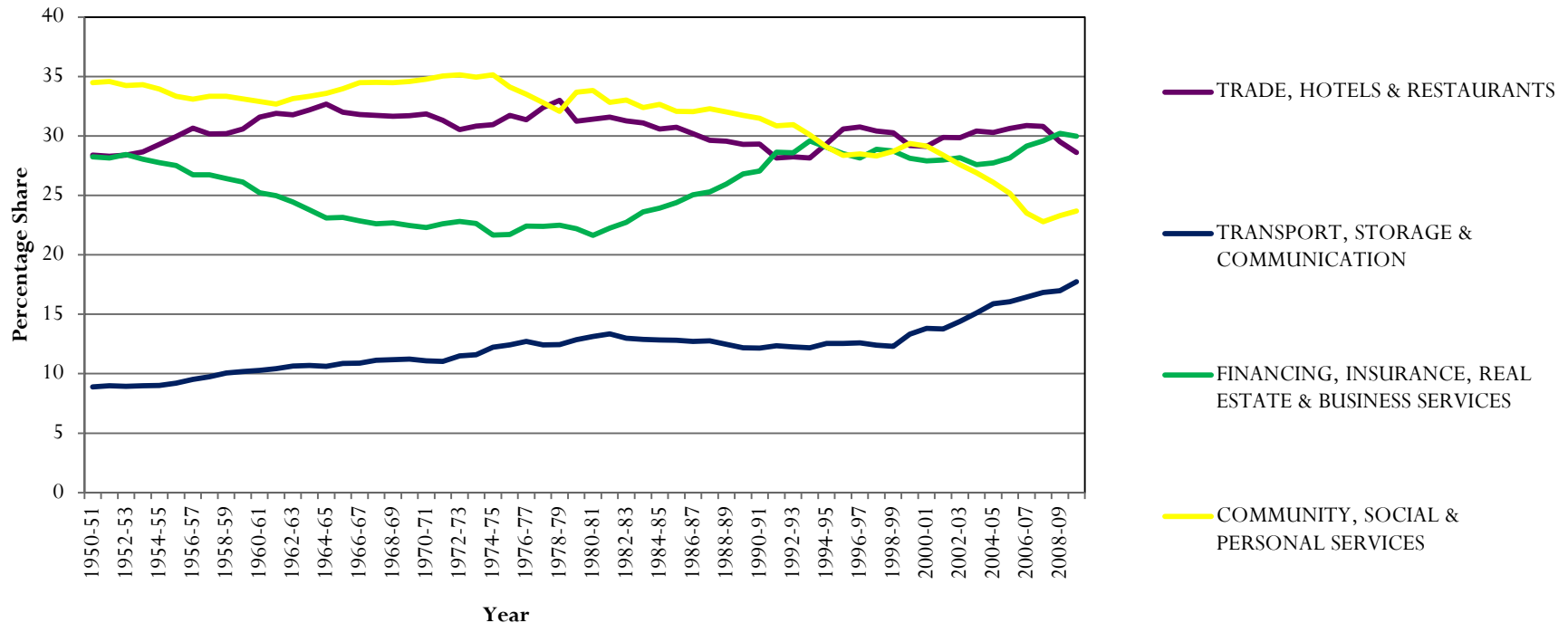# GROWTH AND STRUCTURAL CHANGE IN INDIA'S FINANCIAL SERVICES

Dr. Purba Roy Choudhury
Associate Professor, Department of Economics,
The Bhawanipur Education Society College, Kolkata

Some Observations

- India moved to a high growth path in terms of real GDP following the initiation of the economic reforms in 1991.

- Agriculture and manufacturing sectors have experienced phases of deceleration, stagnation and growth

- Services sector has shown a uniform increasing growth trend

- Service sector growth picked up in the 1980s, accelerated in the 1990s, and further accelerated after 2000-01, when it averaged 8.8% per annum. Interestingly, since 2005-06, it has been growing at the rate of 9.8% per annum, though in 2010, it decelerated negligibly due to the onset of global recession.

- The fastest and the highest growing sector among the services was the financial sector

Sub-Sectoral Shares of Services

> Share of TSC and FIRB have increased substantially and are dynamic components of India's service sector.

> Share of THR and CSP have decreased in its share in services GDP and are traditional components of services.

> Dynamic components are primarily instrumental in growth of service sector, while traditional components do not influence much to the growth.

> FIRB shows the fastest rate of growth, followed rather closely by TSC.

Subsector of financial services shares and decadal growth rates

Sector	1970-71 Share in financial services GDP (Share in Services GDP) {Share in GDP} [Average Annual Decadal Growth Rate]	1980-81 Share in financial services GDP (Share in Services GDP) {Share in GDP} [Average Annual Decadal Growth Rate]	1990-91 Share in financial services GDP (Share in Services GDP) {Share in GDP} [Average Annual Decadal Growth Rate]	2000-01 Share in financial services GDP (Share in Services GDP) {Share in GDP} [Average Annual Decadal Growth Rate]	2009-10 Share in financial services GDP (Share in Services GDP) {Share in GDP} [Average Annual Decadal Growth Rate]
Banking and Insurance	23.17 (22.68) {1.72} [5.74]	29.21 (28.67) (2.38) [7.82]	33.63 (33.29) {3.87} [10.5]	39.00 (37.22) {5.48} [10.03]	45.86 (44.28) {7.88} [9.04]
Real Estate, Ownership of Dwellings and Business Services	78.99 (77.32) {5.86} [3.21]	72.66 (71.33) {5.92} [3.13]	67.40 (66.71) {7.76} [7.68]	63.85 (62.08) {8.97} [7.40]	54.14 (52.25) {9.30} [7.90]

- Out of the financial services, share of banking and insurance has risen over time but the share of real estate and services has fallen
- Banking and insurance sector had the fastest rate of growth, specially from the 90s

Data and Methodology

➢ **Data: GDP and sectoral components: CSO's NAS, 2004-05 base year series, Period: 1950-51 to 2009-10.**

• Long time series 1950-2010
• Presence of Structural Break
• Calculation of semi-logarithmic kink growth
• Relationship between the financial sector and non-financial sector

➢ **Methodology: Bai Perron (1998, 2003) multiple structural breaks**
    ➢ **Endogenously and simultaneously determines the points of break**
    ➢ **Determines break irrespective of whether series is non-stationary or not.**
➢ **Calculation of growth rates by Boyce Method (1986)**
➢ **Use of Johansen's (1998) method of cointegration**

Bai-Perron-Structural Break

Growth rates of aggregate and sectoral GDP can be estimated by an exponential function $\ln Y_t = a + gt + u_t$.

The parameters may vary from one growth regime to another.

Therefore, we first estimate the break dates of the above model for aggregate and sectoral GDP and financial sector GDP and accordingly partition the data to estimate the period-wise growth rates.

$$\ln y_t = a_1 + g_1 t + \mu_t, t = 1, \ldots, T_1.$$

$$\ln y_t = a_2 + g_2 t + \mu_t, t = T_1 + 1, \ldots, T_2$$

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$$\ln y_t = a_{m+1} + g_{m+1} t + \mu_t, t = T_m + 1, \ldots, T$$

$T_o = 0$ and $T_{m+1} = T$ the total number of observations. The number of break points m and the break dates $(T_1, \ldots, T_m)$ are treated as unknown and estimated from the data.

Bai-Perron Structural Break

The model is characterized as:

Pure Structural Break:

$$y_t = c_j + \beta_j t + \rho_j y_{t-1} + u_t, t = T_{j-1,\ldots\ldots\ldots\ldots\ldots}T$$

Partial Structural Break:

$$y_t = c_j + \beta_j t + \rho y_{t-1} + u_t, t = T_{j-1,\ldots\ldots\ldots\ldots\ldots}T$$

➤ Two structural breaks model differ in the way that in the generalized case, the break is taken into consideration with a variable deterministic trend coefficient β and autoregressive parameter ρ.

➤ The partial structural break model is restricted in the sense that it assumes the autoregressive parameter, ρ, to be constant.

UDMAX and WDMAX: null of no structural breaks is tested against the alternative of an unknown number of breaks. The tests determine if at least one structural break is present.

Sup $F_T(0|l)$: series of tests for hypothesis of 0 breaks vs. *l* breaks.

SupF$_T$(*l*+1/*l*): If these tests show evidence of at least one structural break, then the number of breaks can be determined by the SupF(*l*+1/*l*). If the test is significant at the 5 per cent level, *l*+1 breaks are chosen.

Structural Break: Empirical Results

	Banking and Insurance	Real estate, Ownership of dwellings and business services	Banking Insurance and Financial Services	Total Services	GDP	Non-Financial Sector
Udmax	329.90*	388.24*	353.49*	351.59*	319.54*	317.25*
Wdmax	723.93*	840.19*	770.72*	771.27*	701.18*	696.16*
$SupF_T(0\mid1)$	190.27*	235.47*	224.66*	223.60*	168.16*	161.32*
$SupF_T(0\mid2)$	228.70*	267.21*	247.53*	248.48*	211.63*	208.95*
$SupF_T(0\mid3)$	279.81*	330.56*	311.32*	314.94*	258.65*	254.86*
$SupF_T(0\mid4)$	829.83*	388.24*	353.49*	351.59*	296.91*	296.77*
$SupF_T(0\mid5)$	329.90*	382.88	351.22	351.48	319.53*	317.25*
$SupF_T(2\mid1)$	39.84*	38.01*	39.30*	39.89*	36.87*	39.54*
$SupF_T(3\mid2)$	67.11*	67.68*	64.23*	65.26*	73.00*	70.54*
$SupF_T(4\mid3)$	18.29*	10.62	9.80	10.36	16.88*	15.49*
$SupF_T(5\mid4)$	0.00	0.00	0.00	0.00	0.00	19.31*
Sequential	4	3	3	3	4	5
Estimated break dates with m=5	1959, 1969, 1985, 1997	1972, 1987, 1999	1971, 1986, 1998	1971, 1986, 1998	1960, 1969, 1986, 1999	1959, 1968, 1977, 1986, 1999

➢ Break in FIRB more or less matches the break in services GDP and GDP.
➢ Break in banking and insurance brought about a break in financial services as well as ervices GDP.

Estimating kinked exponential model

Boyce Method (1986): **Generalized Exponential Model**

      2 Breaks: Double kink semi-logarithmic trend equation

$$\ln y_t = a_1 + \beta_1(D_1 t + D_2 k_1 + D_3 k_3) + \beta_2(D_2 t - D_2 k_1 - D_3 k_1 + D_3 k_1) + \beta_3(D_3 t - D_3 k_3) + u_t.$$

- D_i for all i=1,2,3 takes value 1 in ith sub-period and 0 otherwise
- K_1 and K_2 are values of the break time points
- Putting D_i for all i = 1,2,3
- $\log Y_t = \alpha + \beta_1 t + ut$ $\log Y_t = \alpha + (\beta_1 - \beta_2)K_1 + \beta_2 t + ut$
- $\log Y_t = \alpha + (\beta_1 - \beta_2)K_1 + (\beta_2 - \beta_3)K_2 + \beta_3 t + ut$

      3 Breaks: Triple kink semi-logarithmic trend equation

$$\ln y_t = a_1 + \beta_1(D_1 t + D_2 k_1 + D_3 k_1 + D_4 k_1) + \beta_2(D_2 t - D_2 k_1 - D_3 k_1 - D_4 k_1 + D_3 k_2 + D_4 k_3) + \beta_3(D_3 t - D_3 k_2 - D_4 k_2 + D_4 k_3) + u_t.$$

- D_i for all i = 1,2,3,4 takes a value 1 in the ith sub-period and 0 otherwise
- K_1, K_2 and K_3 are the values of the break time points
- Putting D_i for all i = 1,2,3,4
- $\log Y_t = \alpha + \beta_1 t + ut$ $\log Y_t = \alpha + (\beta_1 - \beta_2)K_1 + \beta_2 t + ut$
- $\log Y_t = \alpha + (\beta_1 - \beta_2)K_1 + (\beta_2 - \beta_3)K_2 + \beta_3 t + ut$
- $\log Y_t = \alpha + (\beta_1 - \beta_2)K_1 + (\beta_2 - \beta_3)K_2 + (\beta_3 - \beta_4)K_3 + \beta_4 t + ut$

Estimated growth rates

Sectors	Regime 1	Regime 2	Regime 3	Regime 4	Regime 5
Banking and Insurance	8.01 (1950/51- 1959/60)	5.13 (1960/61- 1969/70)	8.12 (1970/71- 1985/86)	10.48 (1986/87- 1997/98)	10.05 (1998/99- 2009/10)
Real Estate, Ownership of dwellings and business services	2.32 1950/51- 1972/73)	6.66 (1973/74- 1987/88)	7.83 (1987/88- 1999/2000)	7.59 (2000/01- 2009/10)	
Banking Insurance and Financial Services	2.91 (1950/51- 1971/72)	5.75 (1972/73- 1986/87)	8.84 (1987/88- 1998/99)	8.60 (1999/2000 -2009/10)	
Total Services	2.95 (1950/51- 1971/72)	5.68 (1972/73- 1986/87)	8.81 (1987/88- 1998/99)	8.53 (1999/2000 -2009/10)	
GDP	3.96 (1950/51- 1960/61)	3.32 (1962/63- 1969/70)	3.99 (1970/71- 1986/87)	5.88 (1987/88- 1999/00)	7.13 (2000/01- 2009/10)

➢ Last two growth regimes: huge growth rate in GDP, services GDP as well as financial services GDP.

➢ For FIRB, banking and insurance services has the highest level of growth in the last two ime.

Intersectoral Linkages

At the outset of any cointegration exercise, it is required to check that all the variables are I(1). ADF and PP test on the level values i.e., the log values of the financial GDP and non-financial sector GDP

Tests of Unit Root Hypothesis

Test statistic value				
Log of Series	Level		First difference	
	ADF	PP	ADF	PP
Financial Sector	-0.0419 (0.9948)	-0.1022 (0.9937)	-6.2713* (0.0000)	-6.2517 (0.0000)
Non-financial sector	0.1078 (0.9967)	1.2633 (0.9999)	-9.8617* (0.0000)	-10.5158 (0.0000)

* indicates significant values at 1% level of significance.

Results of theJohansen's Cointegration tests.

Eigen value (λ_i)	Null hypothesis	Test statistic value	
		Trace test λ_{max}	Max Eigen value test λ_{trace}
0.2866	r = 0	26.20*	19.58*
0.1078	r = 1	12.51	6.61

* indicate significant values at 5% levels of significance.

Intersectoral Linkages

Long-Run Relationship

$$lnFIRB = 1.6457 \, lnnonFIRB - 11.003$$
$$(13.13) ***$$

Results of VECM model

Dependent Variable	Δ(lnFIRB(-1))	Δ(lnFIRB(-2))	Δ(lnnonFIRB(-1))	Δ(lnnonFIRB(-2))	ECM(-1)	C
Relationship between financials sector and non-financial sector						
ΔlnFIRB	0.18 (1.37)	0.28** (2.42)	0.27** (2.74)	-0.019 (-0.18)	-0.052** (-2.98)	0.02** (2.37)
ΔlnnonFIRB	0.25 (1.33)	0.22 (1.27)	-0.28* (-1.96)	-0.18 (-1.11)	0.00 (NA)	0.038** (2.85)

* indicate significant values at 5% levels of significance.

➢There is a bidirectional causality running from the financial sector to the non-financial sector.
➢The development of the financing, insurance, real estate and banking services sector has enabled the economy to sustain its growth momentum on account of the significant linkages with crucial and critical sectors of the economy such as infrastructure, construction activity etc.

Regimes of Growth and Structural Change

- **Phase 1: 1950s to early 1970s:** With the strategic industrial policy of the Second Plan on heavy industry led growth, banking sector saw the first important change in terms of bank nationalization in 1969.

- The conservative economic policies of the government during this phase were the reason for this nature of economic growth.

- **Phase 2: Early 1970s to mid-1980s:**— The main factor that contributed to the acceleration of growth rates since the 1980s are the government withdrew some constraints on big business to expand, and encouraged them to areas hitherto reserved for the public sector.

  - The government liberalised credit for big borrowers, gave tax concession to large investors, and allowed the private sector to borrow directly from the public.

  - The structural change in India's GDP sector happened long before the initiation of economic reforms in India in the early 1990s.

Regimes of Growth and Structural Change

- **Phase 3: Mid 1980s to late 1990s**: Private Organized sector led decisive reinforcement of services dominated growth trajectory.

- Fallout of the Economic Reforms of 1991. Opening up of the economy along with increased investments, growing consumption and outsourcing boom boosted the growth of software sector.

- Banking sector reforms of 1991 and 1995 formulated major policies in the financial sector like giving licenses to private sector banks as part of the liberalisation process, opening of the insurance sector, etc.

- Real estate sector growth has been backed by both demand factors like unfulfilled demand of dwelling units and lack of infrastructure and supply side factors like increased rationalisation of tax structure, reduced borrowings cost, tax benefits to loan seekers, etc.

- The highest growth in banking and finance met the demand for personal loans, thereby leading to real estate boom. The car industry, like real estate developed during this period, with increased benefits to loan takers and improved post purchase services.

- **Phase 4: late 1990s till 2010:** Further increase in GDP brought about by further infrastructure like construction, transport, communication and business services in conjunction to the earlier phase.

Thank You