Measuring the Contribution of Labour Composition in Gross Value Added in India – The Human Capital Approach

भारतीय रिज़र्व बैंक
Reserve Bank of India
India's Central Bank

Outline

I — **Motivation**

II — Methodology

III — **Indian Labour Market: Stylised Facts**

IV — **Findings**

V — **Conclusion**

भारतीय रिज़र्व बैंक
Reserve Bank of India
India's Central Bank

I

Motivation

भारतीय रिज़र्व बैंक
Reserve Bank of India
India's Central Bank

Motivation

Motivation :

❏ Labour and Capital are the two primary factors of production.

❏ Labour in National Accounts Framework –
   ▪ Compensation of Employee
   ▪ Mixed Income - do not segregate between self-employed and capital income.

❏ India KLEMS - Constructs time series of employment and labour quality from 1980-81 to 2021-22.

❏ Link labour input from India KLEMS with gross value added (GVA) of NAS.

II **Methodology**

Number of Person Employed

Sources of Data:
- Employment and Unemployment Surveys (EUS), Periodic Labour Force Survey (PLFS); and
- Population Census.

Methodology:
- ❑ To maintain consistency across industry classification - concordance has been worked out between various rounds of National Industrial Classification Codes.

- ❑ Worker Participation Rates (WPRs) by the 'usual principal status' and the 'subsidiary status' (UPSS) are obtained from EUS and PLFS and applied to the corresponding period's population estimates from Census to estimate the number of workers.

- ❑ Interpolation is centred around 1st October in alignment with the mid point of the financial year.

Labour Quality Index

Labour Quality Index is constructed using Jorgenson, *et. al* (1987) methodology.

Growth rate of the aggregate labour volume index is defined as:

$$\Delta\ln L_w = \Sigma_l \, v_{ll} \, \Delta\ln L_l \ldots\ldots\ldots\ldots\ldots(1)$$

$$v_{ll} = \tfrac{1}{2}\left[\, v_l(t) + v_l(t-1)\,\right]$$

and $\qquad v_l = w_l^L L_l \,/\, \Sigma_l \, w_l^L L_l$

Growth rate of the quality index Q^L can be expressed in the form:

$$\boldsymbol{\Delta\ln \; Q^{L} \; = \; \Sigma_l v_{ll} \; \Delta\ln \; L_l \; - \; \Delta\ln \; L} \quad \ldots\ldots\ldots(2)$$

where L_w is the weight adjusted aggregate labour; L_l is labour of a particular education catagory;

$l = 1,2,\ldots.,n$ i.e. the number of education categories;

v_l is the value share of labour for the lth education category

w_l^L is the wage rate of labour for the lth education category;

Σ_l is the summation over all education categories

where $\quad L = \Sigma_l L_l$

Q^L is the quality index of labour

L is the total number of labour (unadjusted) of all education categories

Labour Income Share

❑ Earnings of different types of workers : Based on educational level

- Earnings of casual and regular wage workers are estimated directly from the NSSO and PLFS survey rounds;

- Earnings of self-employed workers is estimated econometrically due to unavailability of data.

  ➢ **Estimates of earnings of self employed -** Mincer function has been applied to the earnings of casual and regular workers, and the results are used to find the corresponding earnings of self-employed workers. Sample selection bias has been corrected for by using Heckman's two step procedure.

भारतीय रिज़र्व बैंक
Reserve Bank of India
India's Central Bank

Contribution of Labour Input to GVA Growth

Growth Accounting decomposition is given as –

$$\Delta \ln V^{PF} = \bar{v}_K \Delta \ln K_k + + \bar{v}_{\mathrm{L}} \Delta L_l + TFP^{PF}$$

Where K_k=is capital type k (e.g., machinery and buildings)

L_l is the labor type l (e.g., high-skilled and low-skilled);

$\bar{v}_K$ is the two-period average income share of capital in value added,

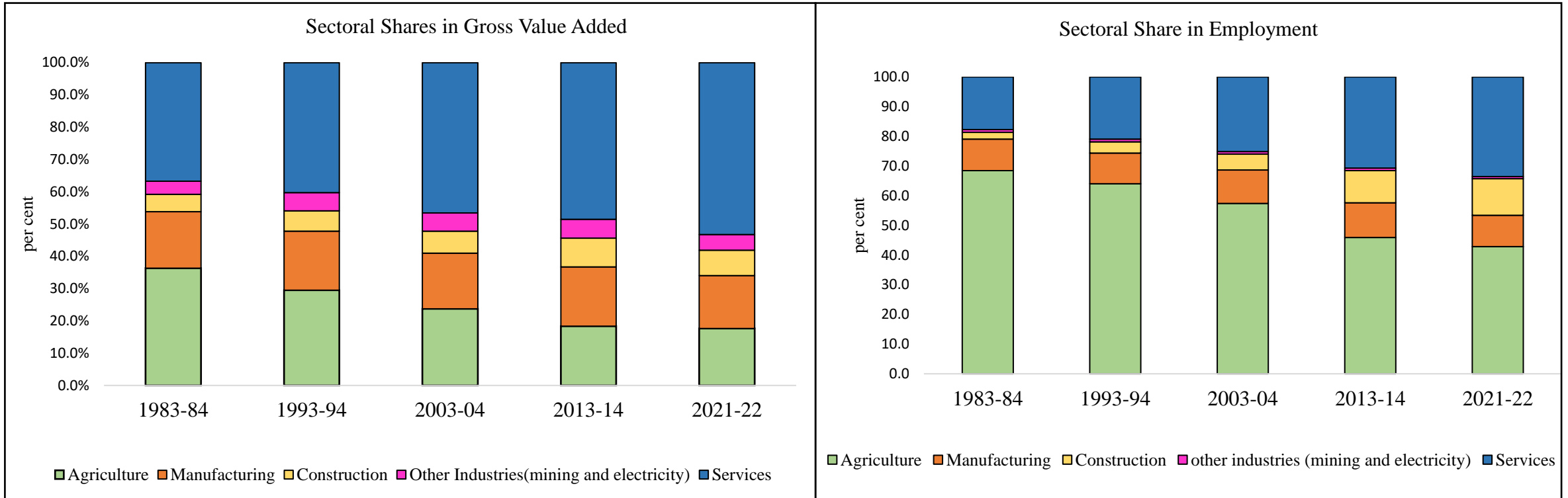$\bar{v}_{\mathrm{L}}$ is the two-period average income share of labour in value added .

$\mathrm{TFP}^{\mathrm{PF}}$ =TFP growth rate using aggregate production function.

भारतीय रिज़र्व बैंक
Reserve Bank of India
India's Central Bank

III Indian Labour Market: Stylised facts

Sectoral Shares of Value Added and Employment

Sectoral Shares in Gross Value Added
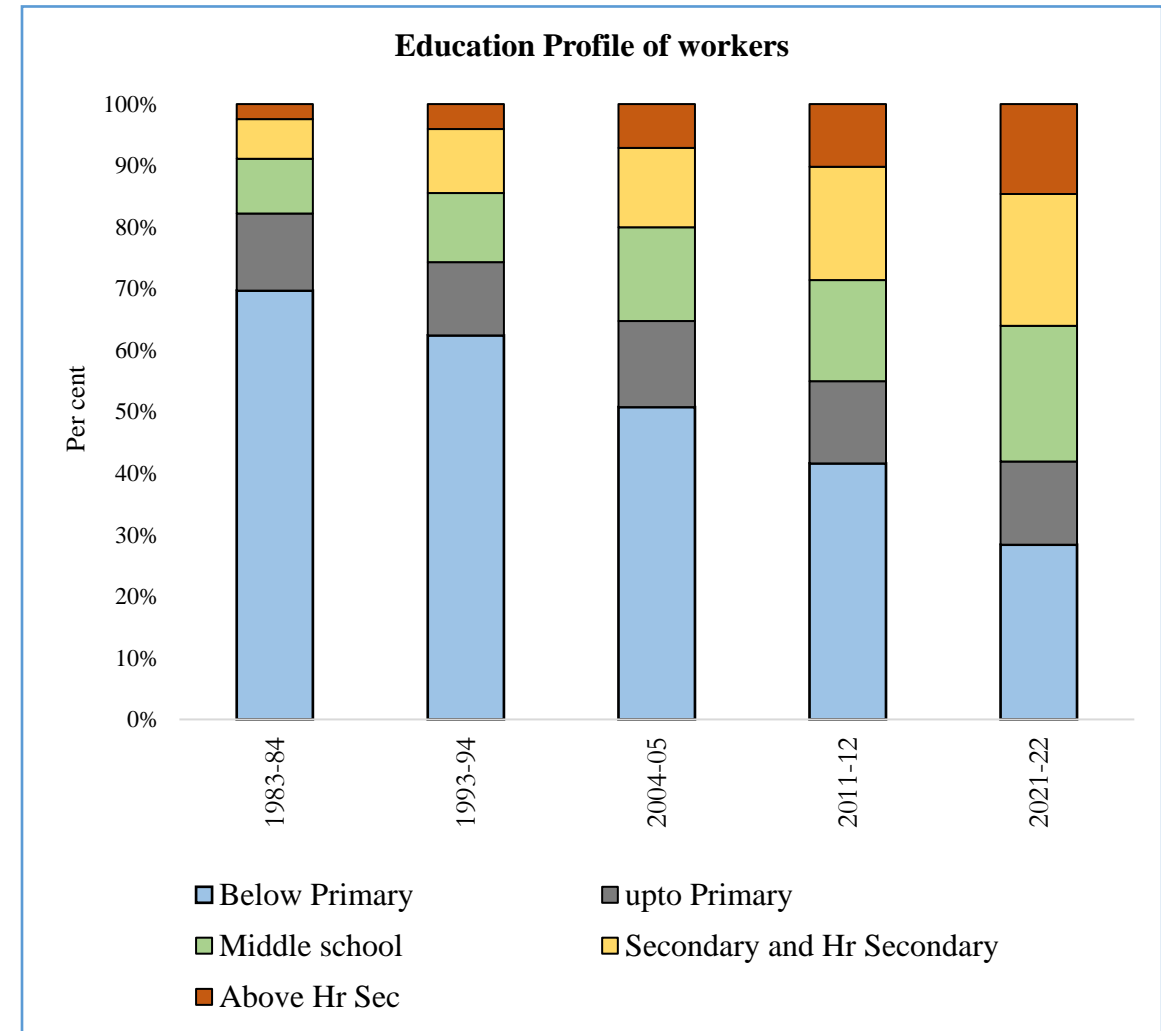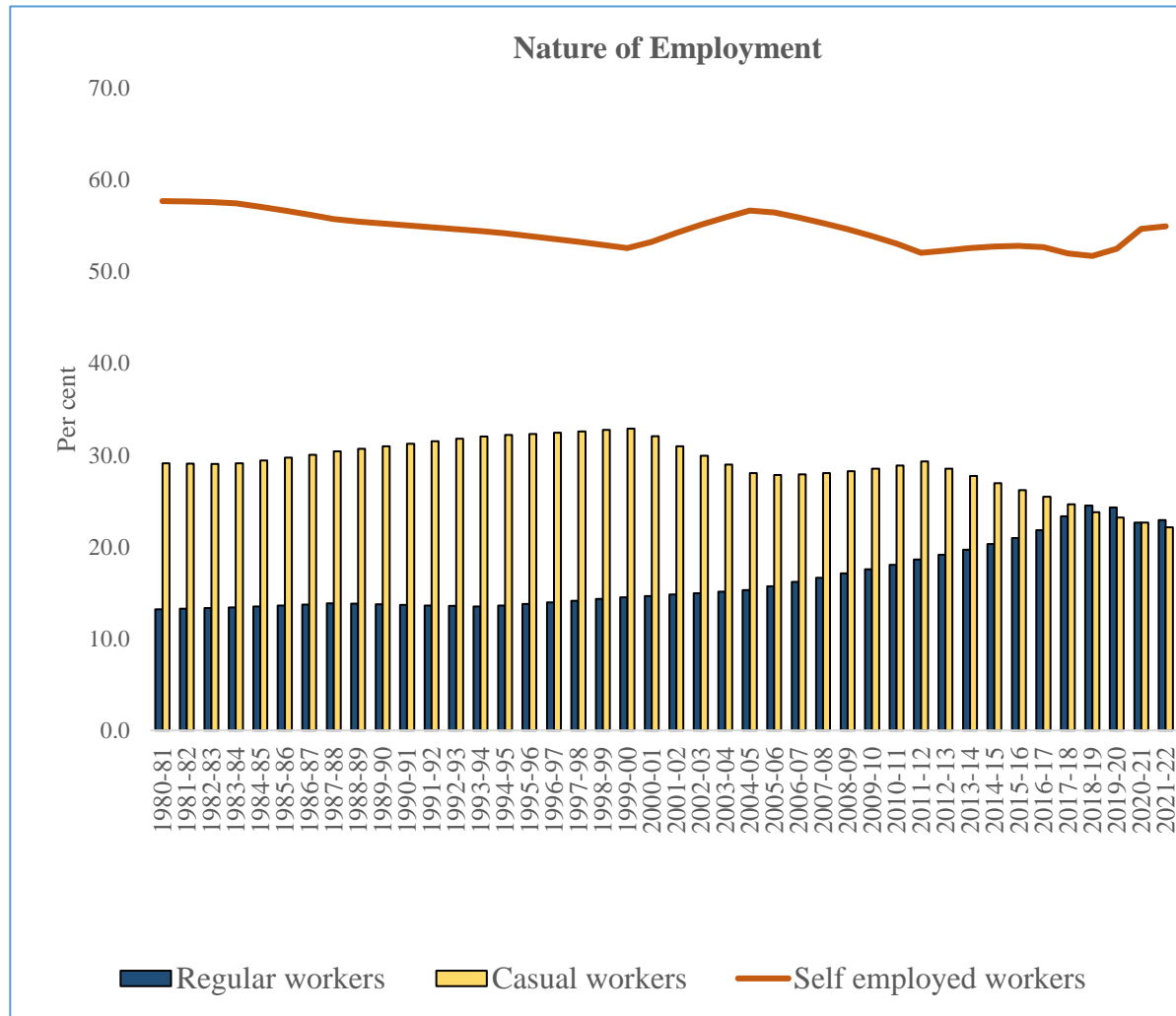
Sectoral Share in Employment

Source : Authors estimates based on RBI KLEMS data

- ❑ Services Sector - Largest contributor to the GVA.

- ❑ Structural shift in employment - agriculture to construction and services.

- ❑ Share of manufacturing sector's employment and its contribution to GVA remains in range.

11

भारतीय रिज़र्व बैंक
Reserve Bank of India
India's Central Bank

Nature of Employment and Education Profile for Total Economy

Nature of Employment

Legend: Regular workers, Casual workers, Self employed workers

Education Profile of workers

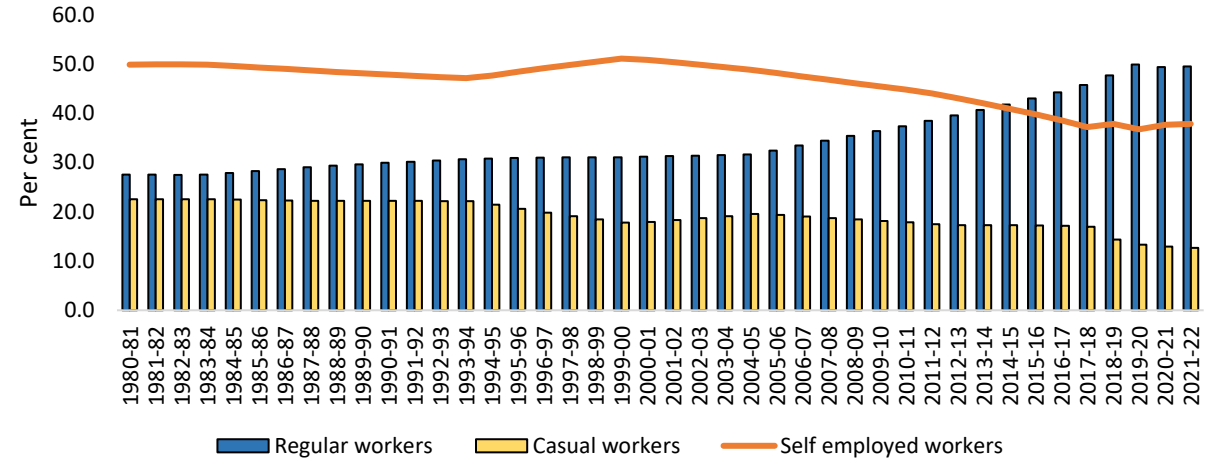Legend: Below Primary, upto Primary, Middle school, Secondary and Hr Secondary, Above Hr Sec

Source : Authors estimates based on RBI KLEMS data

Nature of Employment

Agriculture — Regular workers, Casual workers, self employed workers

Manufacturing — Regular workers, Casual workers, Self employed workers

Construction — Regular workers, Casual workers, Self employed workers

Services — Regular workers, Casual workers, Self employed workers

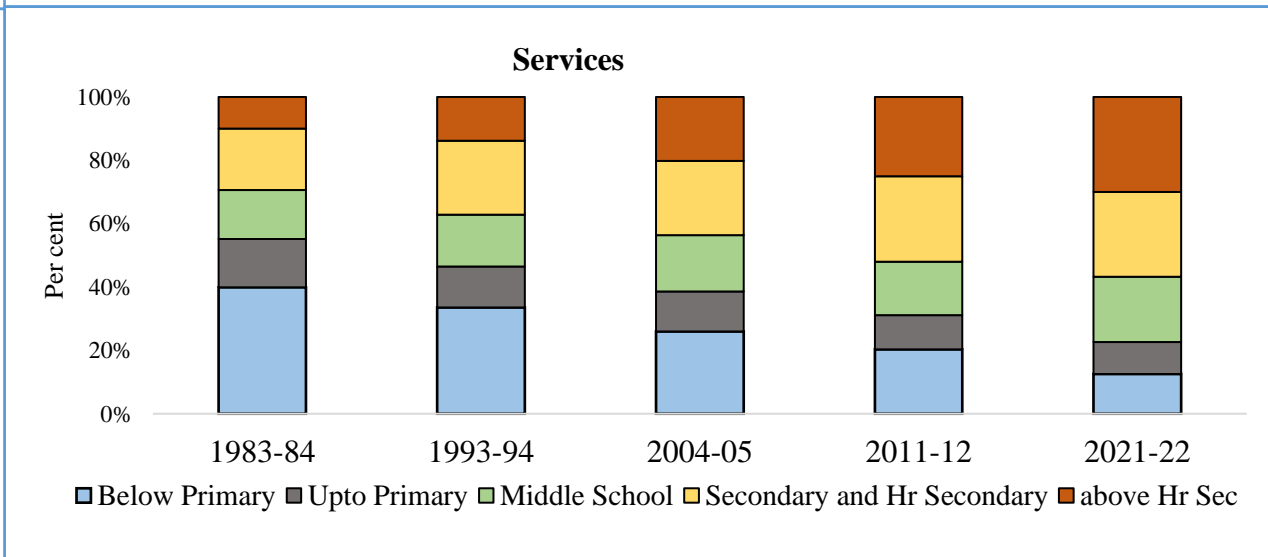*Source : Authors estimates based on RBI KLEMS data*

Education Profile of Workers
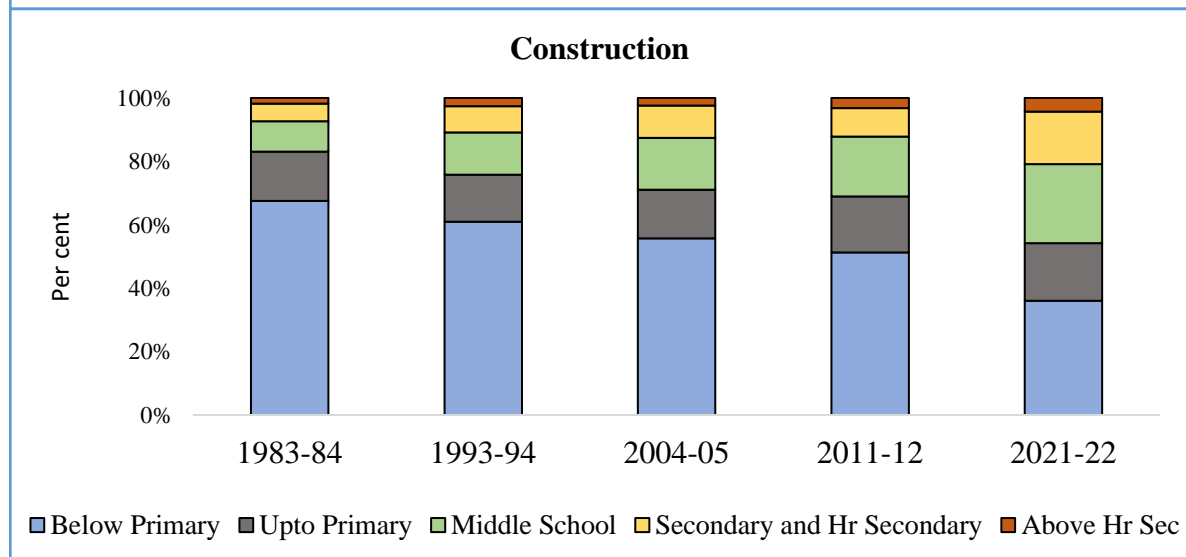

Agriculture

Manufacturing

Construction

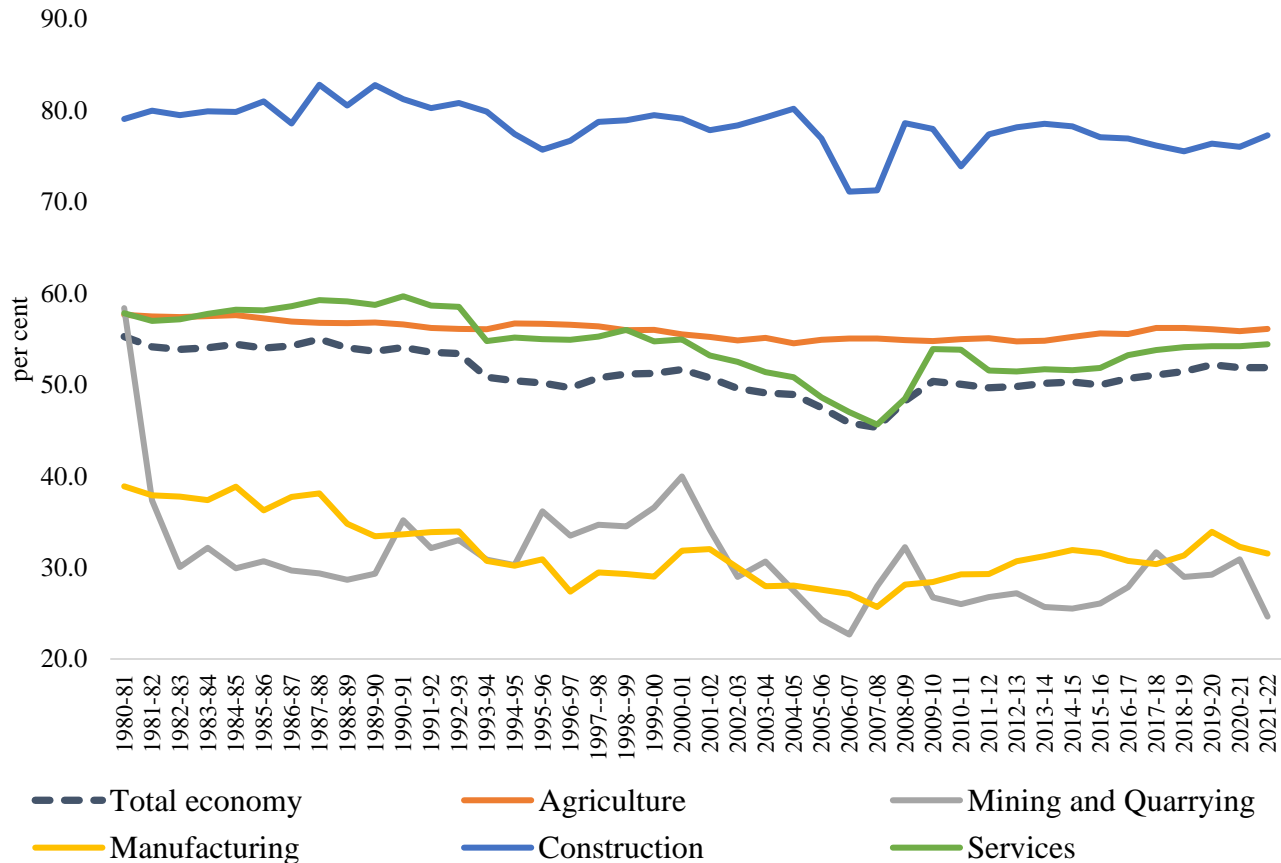**Services**
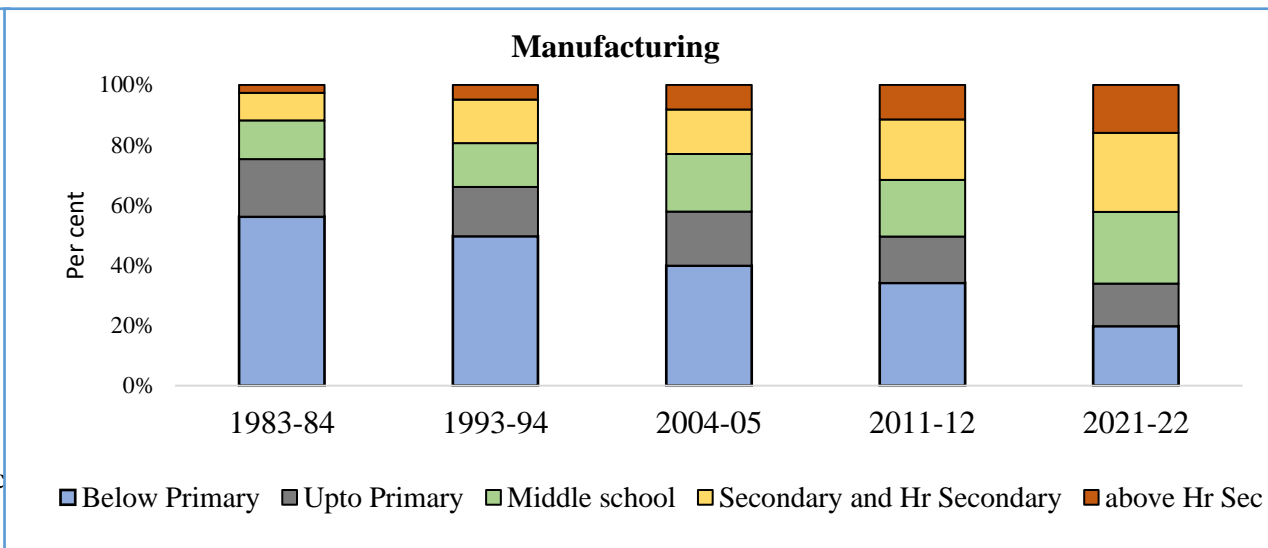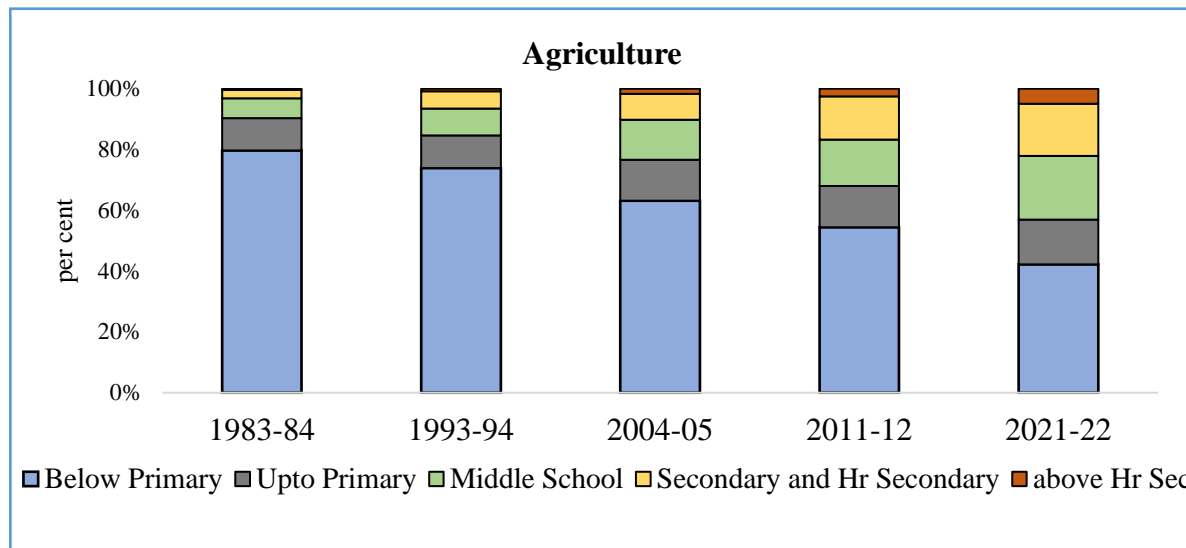
Source : Authors estimates based on RBI KLEMS data

Compensation of Workers

Labour Income Share: Sector-wise

Sectors	Growth in Labour Productivity (1980 to 2022)	Growth in Real Wages (1980 to 2022)
	Per cent	Per cent
Total Economy	**4.4**	**4.3**
Agriculture	3.1	3.0
Mining	3.9	2.4
Manufacturing	5.1	4.5
Construction	-0.2	-0.2
Services	3.8	3.7

Source : Authors estimates based on RBI KLEMS data

Quality of Employment: Sectoral Distributions

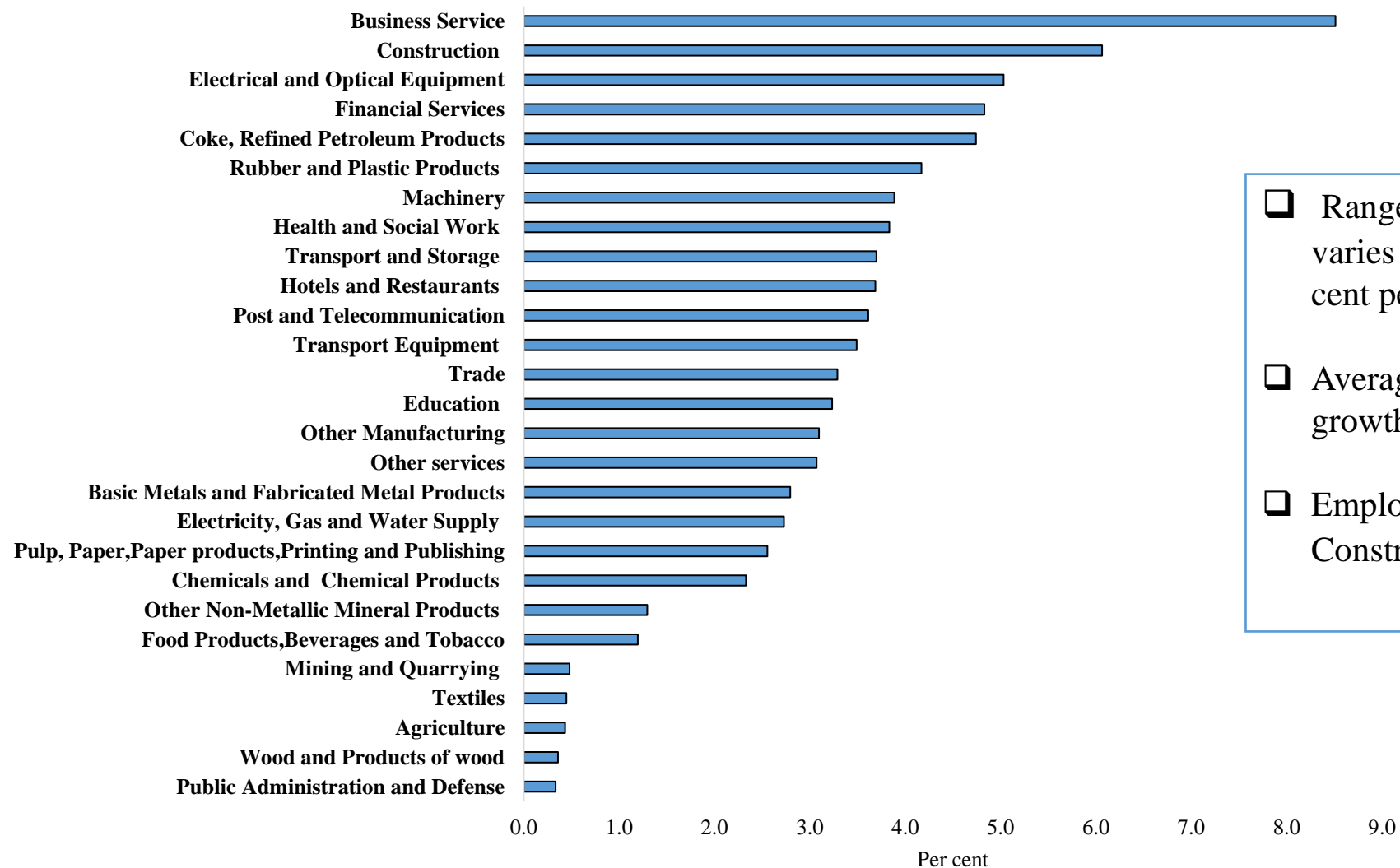|	Sectors with relatively larger proportion of high skilled workers	Proportion of Regular workers	Average Wage per Day
1	Pulp, Paper, Printing and Publishing	High	High
2	Coke, Refined Petroleum Products	High	Low
3	Chemicals and Chemical Products	High	High
4	Rubber and Plastic Products	High	Low
5	Basic Metals and Fabricated Metal Products	High	Low
6	Machinery	High	High
7	Electrical and Optical Equipment	High	Low
8	Transport Equipment	High	Low
9	Electricity, Gas and Water Supply	High	High
10	Post and Telecommunication	High	High
11	Financial Services	High	High
12	Business Service	High	High
13	Public Administration and Defense	High	Low
14	Education	High	High
15	Health and Social Work	High	High

Note : Sectors are classified as high when the proportion of regular workers and the wage rate are above the total economy average. Similarly, sectors are classified as low if the proportion of regular worker and the sectoral wage is below the national average.

Source : Authors estimates based on RBI KLEMS data

भारतीय रिज़र्व बैंक
Reserve Bank of India
India's Central Bank

IV **Findings**

Growth in Employment, 1980 to 2022

Business Service
Construction
Electrical and Optical Equipment
Financial Services
Coke, Refined Petroleum Products
Rubber and Plastic Products
Machinery
Health and Social Work
Transport and Storage
Hotels and Restaurants
Post and Telecommunication
Transport Equipment
Trade
Education
Other Manufacturing
Other services
Basic Metals and Fabricated Metal Products
Electricity, Gas and Water Supply
Pulp, Paper,Paper products,Printing and Publishing
Chemicals and Chemical Products
Other Non-Metallic Mineral Products
Food Products,Beverages and Tobacco
Mining and Quarrying
Textiles
Agriculture
Wood and Products of wood
Public Administration and Defense

Per cent

❑ Range of employment growth varies from 8.5 per cent to 0.3 per cent per annum.

❑ Average total economy employment growth was 2.7 per cent per annum.

❑ Employment growth is driven by Construction and Services sectors.

Source : Authors estimates based on RBI KLEMS data

भारतीय रिज़र्व बैंक
**Reserve Bank of India**
India's Central Bank

Growth in Labour Quality Index, 1980 to 2022
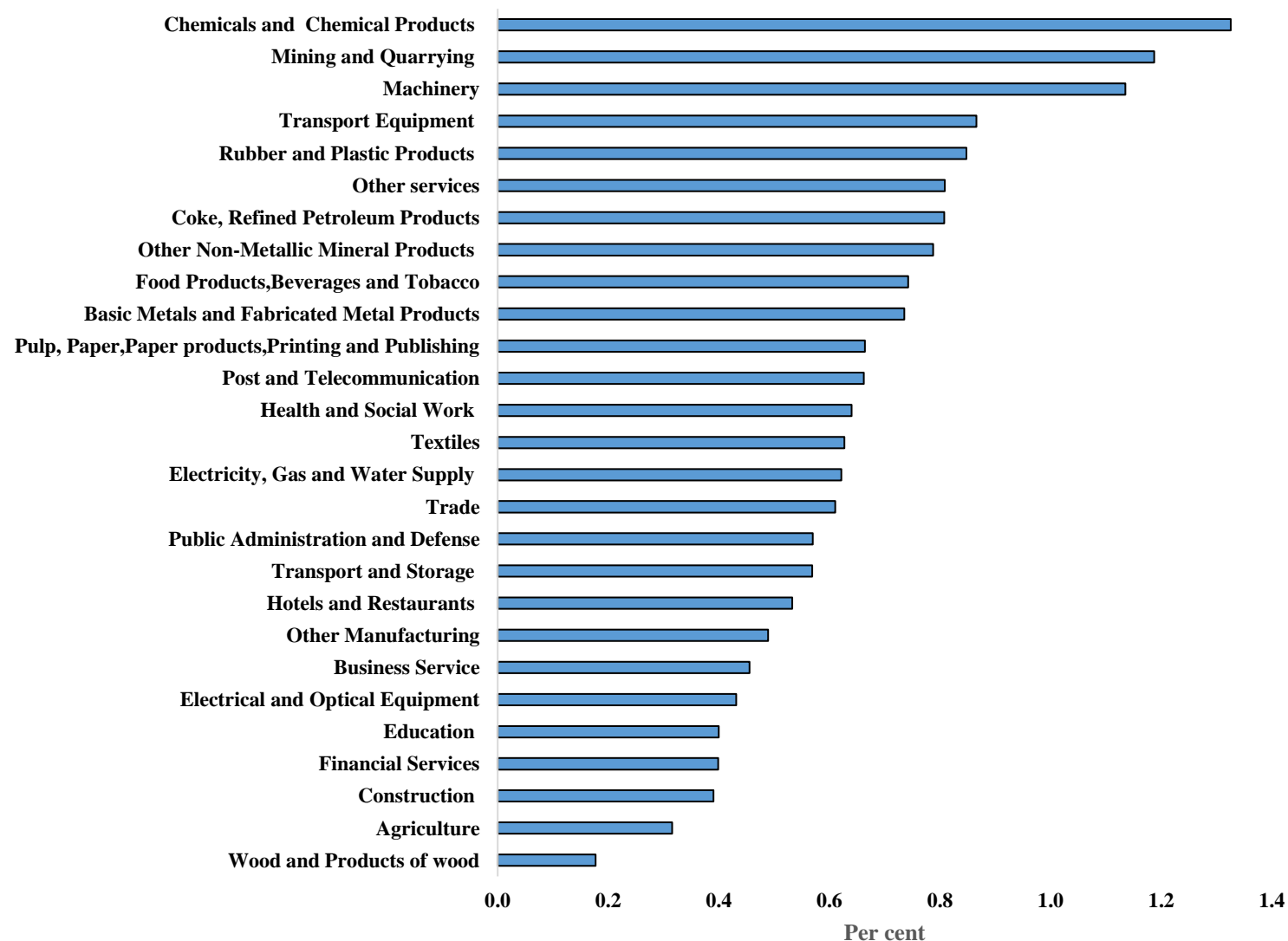
- ❑ Labour quality index growth varies from 1.3 per cent to 0.17 per cent per annum.

- ❑ Average total economy labour quality index growth was 0.7 per cent per annum.

- ❑ The growth of labour quality index has been relatively low for Agriculture and Construction, and was high for Manufacturing, Mining quarrying and Services
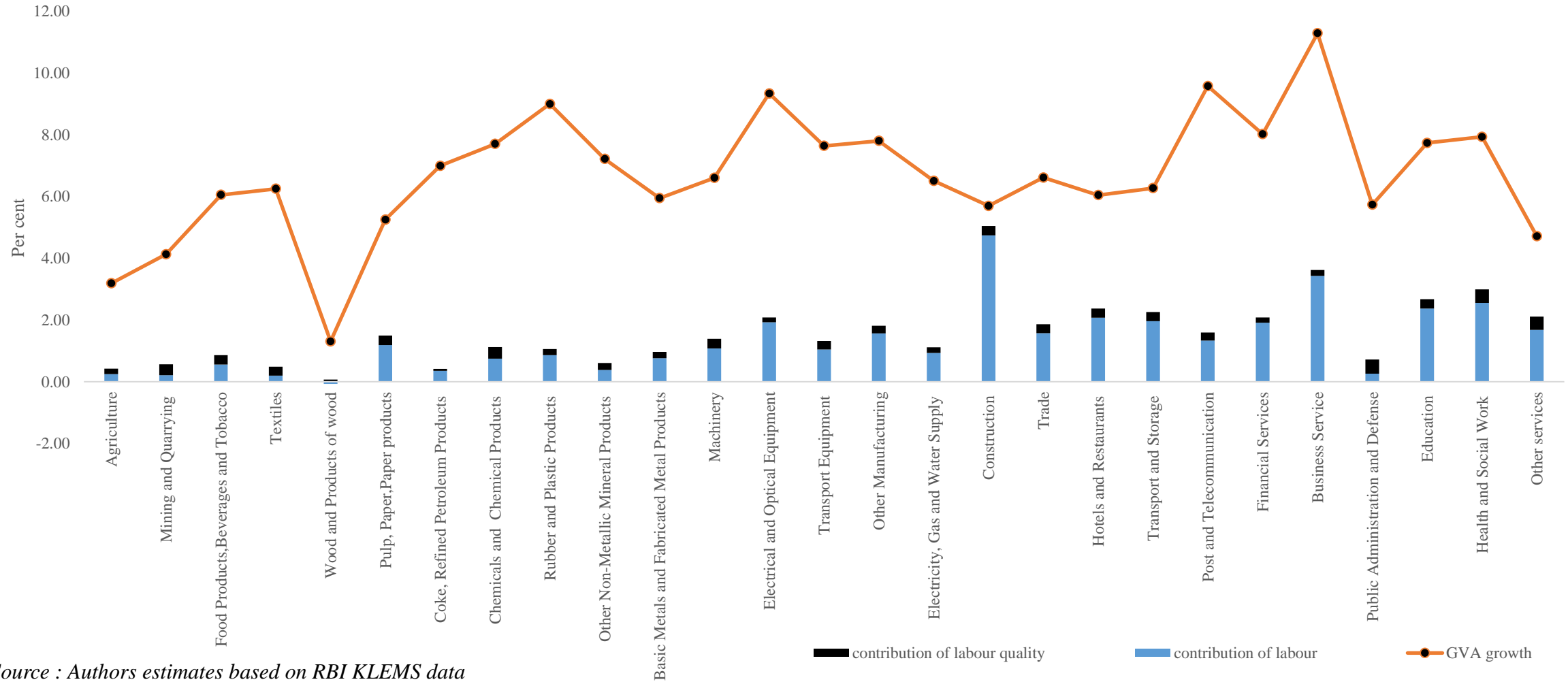
Source : Authors estimates based on RBI KLEMS data

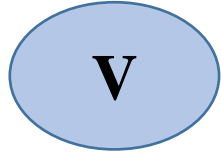# Sources of GVA Growth 1980 to 2022
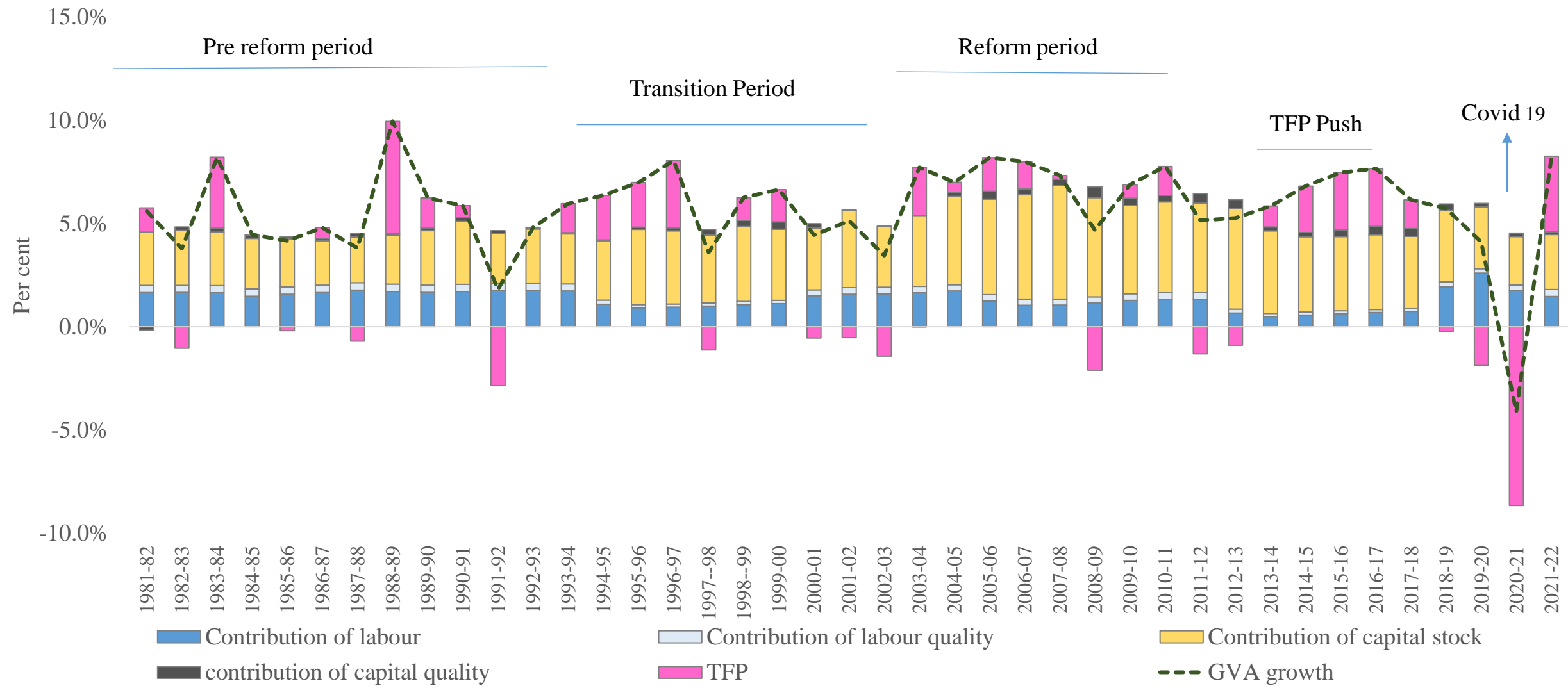
Source : Authors estimates based on RBI KLEMS data

Contribution of Labour and Labour Composition to GVA Growth

Source : Authors estimates based on RBI KLEMS data

V Conclusion

Summary Findings

❑ Structural shift in employment from agriculture to construction and services.

❑ Average contribution of labour input to output (GVA) growth works out to 30.0 percentage points during 1980-81 to 2021-22

  ▪ Of which, contribution of labour to output growth works out to 25.0 percentage points; and

  ▪ Labor quality contributes an additional 5.0 percentage points to output growth.

❑ Average share of labour income in the gross value added works out to around 55.0 per cent.

❑ Increase in education levels of workers, especially in capital-intensive manufacturing and services sectors.

❑ Labour quality index growth increased on an average by 0.7 per cent per annum from 1980-81 to 2021-22.

  ▪ Capital intensive manufacturing sectors (e.g., chemicals, machinery and transport equipment) observed relatively higher growth in labour quality.

  ▪ Among services, health and social work, education, public administration and defence recorded higher growth in labour quality index.

Thank You