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EMPLOYMENT ELASTICITY OF OUTPUT IN THE CONSUMER GOODS MANUFACTURING SECTOR OF INDIA DURING THE POST-LIBERALIZATION PERIOD

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ABSTRACT

This paper estimates the employment elasticity of output for India's consumer-goods manufacturing sector using industry-level data for 1991–92 to 2019–20. While prior research has examined elasticity at the aggregate or all-manufacturing level, no study has evaluated the KLEMS-defined consumer-goods sector as a distinct analytical unit or assessed how capital deepening conditions its employment responsiveness. Using fixed-effects regressions across constituent industries, the analysis reports sector-level elasticities for the full period and two post-liberalization sub-periods, with and without controls for capital intensity. The results show that sector-level elasticity is close to zero over the long run and turns negative in the 2003–04 to 2019–20 sub-period, indicating labour-displacing growth. Controlling for capital intensity raises elasticity somewhat but does not reverse this pattern. Industry-level estimates reveal pronounced heterogeneity: Wood Products and Textiles exhibit consistently negative elasticities, while Pulp and Paper and manufacturing n.e.c. display modest employment absorption. These findings align with the labour-productivity framework proposed by Kapsos (2005) and indicate that rising capital–labour ratios and sector-specific structural characteristics have progressively reduced the employment content of growth in consumer-goods manufacturing.

Keywords: Employment Elasticity, Consumergoods Manufacturing, Capital Intensity, Labour Productivity, Post-Liberalisation India

INTRODUCTION

The evolution of India's manufacturing sector since the early 1990s has been shaped by substantial structural changes, but the performance of consumer-goods industries within this broader transformation has remained relatively underexamined. These industries—comprising food processing, textiles, wood products, paper, and miscellaneous light manufacturing—have historically played an important role in labour absorption and in meeting domestic consumption needs. Their technological features, low entry barriers, and close link with household demand make them central to any assessment of employment generation in the post-reform era. Yet systematic evidence on the long-run employment responsiveness of output in this segment is almost absent, despite the sector's economic and policy relevance.

Concerns about job creation in India have intensified over time, particularly as periods of strong output growth have not always been accompanied by commensurate gains in employment. Consumer-goods manufacturing provides a particularly useful lens through which to study this relationship because many of its constituent industries have long been characterised as labour-intensive. At the same time, the sector's post-1991 experience was shaped by a distinctive reform trajectory. Import restrictions on consumer

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goods were removed only in 2001, and a large set of simple manufactures remained under small-scale industry reservation until the early 2000s. These features sustained a fragmented production structure through much of the 1990s, while the period after 2003 brought a more competitive environment characterised by scale expansion, technological upgrading, and deeper market integration. This sequencing suggests that the employment–output relationship may have evolved differently across sub-periods.

While several studies have analysed employment patterns in organised manufacturing or in selected labour-intensive industries, there has been no long-horizon, industry-consistent analysis focused specifically on the consumer-goods manufacturing sector within a unified empirical framework. The sector itself is heterogeneous, combining traditional non-durables with other light manufacturing activities that differ significantly in technology and organisation. A sector-level examination, combined with industry-wise estimation, is therefore essential for understanding how employment elasticity has shifted as reforms unfolded and production structures adjusted.

This paper addresses this gap by estimating the employment elasticity of output for the consumer-goods manufacturing sector and its constituent industries for 1991–92 to 2019–20, using the India KLEMS Database (January 2024 release). The analysis covers the full post-liberalisation period and distinguishes between two analytically meaningful sub-periods—1991–92 to 2002–03 and 2003–04 to 2019–20—reflecting the transition from partial liberalisation to a more mature reform environment. By providing long-run elasticity estimates at both the sectoral and industry levels, the paper establishes a consistent empirical benchmark for evaluating the labour-absorbing potential of consumer-goods manufacturing.

The findings have broader implications for India's development trajectory. Although consumer-goods industries are no longer the primary drivers of manufacturing growth, they remain important employers of semi-skilled labour and continue to anchor production structures in several regions. Understanding their employment responsiveness is therefore central to assessing the prospects for non-farm job creation and for identifying structural constraints that shape labour demand within manufacturing. The evidence presented here contributes to these debates by offering a systematic, long-run assessment of how employment responded to output growth in one of India's most enduring industrial segments.

LITERATURE REVIEW

CONSUMER-GOODS MANUFACTURING: STRUCTURAL CHARACTERISTICS AND EVOLUTION

Early research using ISIC and ASI classifications identified consumer-goods manufacturing as a broad group of light-industrial activities centred on food, textiles, wood, paper and simple household manufactures. Bhagavan (1985), Chaudhuri (1989) and Coondoo et al. (1993) showed that India's consumer-goods sector historically encompassed both non-durables and several modern durables, and noted the practical difficulty of allocating mixed-use products—such as metal containers or electrical appliances—into single end-use categories. This literature established consumer-goods manufacturing as a heterogeneous but clearly identifiable subset of industries whose performance is shaped by household demand patterns.

Studies of the pre- and post-reform periods point to persistent demand constraints and a highly regulated environment. Ahluwalia (1986) documented slow growth of consumer non-durables before 1980, attributing this to weak agricultural income growth and restrictive industrial policies. Ahluwalia and Rangarajan (1989) confirmed that consumer-goods output was strongly linked to agricultural performance and relative food–manufactures prices. After 1991, the sector remained uniquely protected: quantitative restrictions and high tariffs persisted on many consumer goods until 2001–02, and nearly 800 items were reserved for small-scale production Ahluwalia (1995), Panagariya (2004), Goldar (2015), McCartney (2019) emphasises the continued dependence of consumer-goods demand on agricultural incomes, the dominance of traditional non-durable consumption and the concentration of FDI takeovers in food, beverages, appliances and pharmaceuticals. These studies characterise consumer-goods manufacturing as labour-intensive, fragmented and strongly tied to domestic demand.

Recent work using the India KLEMS framework provides a long-run assessment of the sector's structural performance. Krishna et al. (2017) and Erumban et al. (2019) show that consumer-goods manufacturing contributed significantly to productivity improvements in the 1980s and early 2000s but lagged behind intermediate- and investment-goods industries in later years. Krishna et al. (2022) find that the sector's value-added growth from 1981–2017 relied increasingly on capital deepening rather than TFP gains and that informal enterprises producing low-end consumer goods exert competitive pressure on the formal segment. These findings underscore the persistence of consumer-goods manufacturing in India's industrial structure and its growing dependence on capital accumulation.

EMPLOYMENT ELASTICITY OF OUTPUT: CONCEPTS, EVIDENCE AND DETERMINANTS

Employment elasticity is widely used to assess how strongly output growth translates into job creation. Islam and Nazara (2000) define elasticity as the percentage change in employment associated with a one per cent change in output and emphasise that the measure must be interpreted cautiously because it captures only the demand-induced component of employment change. They show that elasticity estimates vary across measurement methods and labour-market conditions. Kapsos (2005) formalises the global framework linking output, employment and productivity growth, demonstrating that elasticity must be assessed jointly with productivity dynamics to distinguish between jobless, balanced and productivity-driven growth.

Indian evidence documents a long-term weakening of employment responsiveness. Upender (2006) finds that elasticity in organised manufacturing declined after 1991, with many public-sector industries showing negative values. Mazumdar and Sarkar (2009) demonstrate sharp cyclical shifts in elasticity—from strong responsiveness in the late 1970s to a collapse after 1996—driven by changes in wage behaviour, competitiveness and relative prices. Using NSS and ASI data, Papola and Sahu (2012) and Misra and Suresh (2014) show that aggregate elasticity has steadily declined since the 1970s, approaching zero by the mid-2000s. Aggarwal and Goldar (2019), using India KLEMS, report that aggregate elasticity fell from 0.41 (1980–93) to 0.10 (2003–15), and manufacturing elasticity from 0.35 to 0.15, indicating a structural trend toward jobless growth.

Sector-specific studies highlight the structural determinants of elasticity. Irshad and Qayed (2023) find that elasticity has weakened across most sectors since 2003, turning negative for agriculture and mining, while construction and selected services remain employment intensive. They identify labour quality as the strongest positive determinant, with wage segmentation and sectoral productivity patterns generating heterogeneous effects; labour-regulation proxies appear economically trivial. Basole and Narayan (2020), using ASI industry-level data, show that the observed elasticity in organised manufacturing (0.23) is strongly dampened by rising capital intensity; holding capital intensity constant increases elasticity to 0.70. Their structural-break analysis indicates regime-dependent elasticity during 1988–2017, highlighting the influence of macroeconomic and organisational factors.

Overall, the literature shows that employment elasticity depends on sectoral structure, labour quality, productivity dynamics and the pace of capital deepening. In India, long-run declines reflect technological change, rising capital–labour ratios and shifts in demand. These insights frame the empirical strategy of this paper, which estimates employment elasticity for consumer-goods manufacturing and its constituent industries using fixed-effects log–log models and reports conditional elasticities that control for capital intensity, following Basole and Narayan (2020) approach.

RESEARCH GAP AND OBJECTIVES

Despite the extensive literature on consumer-goods manufacturing and on the employment elasticity of output, no existing study has estimated employment elasticity specifically for India's consumer-goods manufacturing sector as a distinct KLEMS-defined aggregate, nor examined how elasticity behaves across its constituent industries after explicitly controlling for capital intensity. Prior work either treats consumer goods as part of broader use-based classifications Bhagavan (1985), Chaudhuri (1989), Coondoo et al. (1993), Krishna et al. (2017), Erumban et al. (2019), or analyses employment elasticity at the aggregate or all-manufacturing level without isolating consumer-goods industries Upender (2006), Mazumdar and Sarkar (2009), Papola and Sahu (2012), Misra and Suresh (2014), Aggarwal and Goldar (2019). Moreover, industry-level evidence on how capital deepening shapes employment responsiveness—highlighted by Basole and Narayan (2020)—has not been applied to the consumer-goods sector, even though this segment has historically been labour-intensive and central to India's structural transformation.

Against this background, the objective of this paper is to assess the employment responsiveness of output growth in India's consumer-goods manufacturing sector during the post-liberalisation period, using industry-level data for 1991–92 to 2019–20. To operationalise this objective, the study undertakes two sub-objectives:

Sub-Objective A: Sector-Level Elasticity

To estimate the employment elasticity of output for the aggregate consumer-goods manufacturing sector and analyse how this elasticity evolved over the post-1991 period, including phases of differing growth regimes and structural change. The analysis reports both unconditional elasticities and elasticities that account for changes in capital intensity, thereby assessing the extent to which rising capital–labour ratios have influenced the sector's employment responsiveness.

Sub-Objective B: Industry-Level Elasticities

To examine heterogeneity within the sector by estimating employment elasticities separately for each constituent industry and evaluating how their responsiveness has changed over time. This allows identification of divergent patterns of labour absorption, clarifies whether specific industries remain employment-intensive or exhibit jobless growth, and situates the sector-wide elasticity within its internal structural dynamics.

CONCEPTUAL BASIS FOR DEFINING THE CONSUMER-GOODS MANUFACTURING SECTOR

The analysis draws on the India KLEMS database, a multi-sector growth-accounting dataset that provides annual series on output, value added, and input components of capital (K), labour (L), energy (E), materials (M), and services(S) for 27 industries of the Indian economy. The database—hosted on the Reserve Bank of India's website and updated regularly—classifies industries using the International Standard Industrial Classification (ISIC) Rev. 3.1, which corresponds directly to the National Industrial Classification (NIC 2004) codes as documented in the NIC-2008 manual Central Statistical Organisation. (2008), para. 46).

Although India KLEMS itself does not define sectoral groupings such as "consumer-goods manufacturing," earlier KLEMS-based research provides a clear conceptual foundation for grouping these 27 industries into broad sectors. Krishna et al. (2017) divide manufacturing into two use-based blocks—consumer and intermediate goods manufacturing (ISIC 15–28, 36–37) and investment goods manufacturing—providing the earliest identification of consumer-oriented activities as a manufacturing subsector. Erumban

et al. (2019) refine this by adopting a three-way classification into consumer, intermediate, and investment goods industries. Krishna et al. (2022), in the India Productivity Report, formalise this structure. Following this lineage, Table 1 presents the sectoral classification of all 27 India KLEMS industries, expressed in NIC-2004 codes. The consumer-goods manufacturing sector used in this paper comprises Food, Beverages and Tobacco (NIC 15–16); Textiles, Leather and Footwear (NIC 17–19); Wood Products (NIC 20); Paper and Printing (NIC 21–22); and Manufacturing n.e.c./Recycling (NIC 36–37).These industries together cover a broad set of consumer-oriented manufactured products. NIC 15–16 captures processed foods, edible oils, dairy products, bakery items, beverages and tobacco products. NIC 17–19 includes textiles, woven and knitted fabrics, carpets, ready-made garments, leather goods, footwear and various traditional and modern handicraft-based textile and leather products. NIC 20 comprises wood and wood-based products such as plywood, veneers, basic carpentry items and wooden handicrafts. NIC 21–22 covers paper, packaging materials, tissue products, books, newspapers and other printed matter. Finally, NIC 36–37 groups a diverse set of household-use items—furniture, jewellery, toys, sports goods, stationery, handicraft items produced outside the formal machinery-based subsectors, and other articles classified under manufacturing n.e.c. (not elsewhere classified)—alongside recycling activities. Together, these divisions represent the core of India's consumer-goods manufacturing segment.

Table 1

Table 1 Sectoral Classification of the 27 India KLEMS Industries

Industry Serial No.	NIC 2004 two-digit codes	Industry description	Sector
1	01,02, and 05	Agriculture, Hunting, Forestry and Fishing	1. Agriculture
2	10 to 14	Mining and Quarrying	2. Mining
3	15 to 16	Food Products, Beverages and Tobacco	3. Manufacturing of Consumer Goods
4	17 to 19	Textiles, Textile Products, Leather and Footwear	
5	20	Wood and Products of Wood	
6	21 to 22	Pulp, Paper, Paper Products, Printing and Publishing	
7	36 to 37	Manufacturing n.e.c.; Recycling	
8	23	Coke, Refined Petroleum Products and Nuclear Fuel	4. Manufacturing of Intermediate Goods
9	24	Chemicals and Chemical Products	
10	25	Rubber and Plastic Products	
11	26	Other Non-Metallic Mineral Products	
12	27 to 28	Basic Metals and Fabricated Metal Products	
13	29	Machinery n.e.c.	5. Manufacturing of Investment Goods
14	30 to 33	Electrical and Optical Equipment	
15	34 to 35	Transport Equipment	
16	40 to 41	Electricity, Gas and Water Supply	6. Utilities
17	45	Construction	7. Construction
18	50 to 52	Trade	8. Market Services
19	55	Hotels and Restaurants	
20	60 to 63	Transport and Storage	
21	64	Post and Telecommunication	
22	65 to 67	Financial Services	
23	71 to 74	Business Services	
24	75	Public Administration and Defence; Compulsory Social Security	9. Non-market services
25	80	Education	
26	85	Health and Social Work	

27	70, 90 to 93, 95 to 97	Other Services (Real Estate and Community, Social and Personal Services)

Note. NIC = National Industrial Classification. NIC 2004 divisions correspond directly to ISIC Rev. 3.1, as documented in the NIC-2008 manual (Central Statistical Organisation, 2008, para. 46).Sectoral groupings follow the use-based classifications employed in Krishna et al. (2017), Erumban et al. (2019), and Krishna et al. (2022)in the India Productivity Report.Within manufacturing, industries are subdivided into consumer-goods, intermediate-goods and investment-goods groups; within services, industries are subdivided into market and non-market services; the remaining sectors are treated as single aggregates.

STYLISED FACTS ON THE STRUCTURE AND EVOLUTION OF CONSUMER-GOODS MANUFACTURING

Table 2 summarises the average structural profile of the five constituent industries of consumer-goods manufacturing over 1991–92 to 2019–20. Textiles, textile products, leather and footwear form the largest industry within the group, employing on average 1.30 crore persons—substantially higher than food products (1.01 crore) and the remaining industries, each of which employs less than 0.50 crore workers. In terms of real value added, textiles again constitute the largest contributor, averaging ₹1.44 lakh crore annually, closely followed by food products at ₹1.29 lakh crore. By contrast, wood products account for only ₹19,894 crore of real value added on average, making it the smallest segment by output.

The wage structure differs sharply across industries. The pulp and paper group reports the highest real wage rate (₹76,135 per worker), more than four times that of wood products (₹18,238). Capital intensity exhibits even greater dispersion: pulp and paper is extremely capital-intensive (₹20.7 lakh per worker), while wood products remains the least capital-intensive (₹1.20 lakh per worker). The high coefficient of variation for capital intensity (106 per cent) indicates substantial heterogeneity in production technologies within the sector. Taken together, the table highlights a structurally diverse sector in which textiles dominate both employment and output, while wood products operate with the lowest wages and capital intensity, and pulp and paper stand out as a high-wage, high-capital industry.

Table 2

Table 2 Average Structural Characteristics of Constituent Industries of Consumer-Goods Manufacturing, 1991–92 to 2019-20

Industry	Employment (crore persons)	Real Value Added (Rs crore, 2011-12 prices)	Real Wage Rate (Rs. per worker)	Capital Intensity (Rs. per worker)
Food Products, Beverages and Tobacco	1.01	1,29,730	43,780	5,19,149
Textiles, Textile Products, Leather and Footwear	1.3	1,44,359	50,628	3,68,058
Wood and Products of Wood	0.4	19,894	18,238	1,19,709
Pulp, Paper, Paper Products, Printing and Publishing	0.15	27,712	76,135	20,69,681
Manufacturing n.e.c.; Recycling	0.45	32,203	34,527	2,83,062
Coefficient of Variation (C.V)	64%	77%	43%	106%

Note. All values are calculated by the author using the India KLEMS Database (January 2024 release). Employment is measured in crore persons. Real Value Added is expressed in Rs crore at constant 2011–12 prices. The Real Wage Rate is computed as total real wages divided by persons employed. Capital Intensity is defined as the real capital stock (Rs crore, constant 2011–12 prices) per worker. All values represent simple averages over 1991-92 to 2019-20. Coefficient of Variation (C.V.) is calculated across industries for each indicator.

Table 3 summarises how the internal composition of the consumer-goods manufacturing sector has shifted between 1991–92 and 2019–20. Textiles, textile products, leather and footwear—historically the dominant employer—record a sharp decline in their employment share, from 43 per cent to 37 per cent (a fall of 6 percentage points, hereafter pp), even as their share in real value added rises markedly from 33 per cent to 43 per cent (+10 pp). This divergence indicates stronger output performance relative to employment within the industry.

Food products remain broadly stable, with a minimal change in employment share (–1 pp) and a modest decline in value-added share (–3 pp). Wood and products of wood experience the steepest contraction: employment share declines by 2 pp and value-added share falls by 11 pp, making it the most diminished segment in relative terms.

By contrast, manufacturing n.e.c. and recycling expand significantly over the period. Their employment share increases from 11 per cent to 16 per cent (+5 pp), while their value-added share rises from 4 per cent to 12 per cent (+8 pp), suggesting a substantial

strengthening of activity within this heterogeneous group. The pulp, paper and printing industry shows a moderate rise in employment (+2 pp) alongside an increase in value-added share (+4 pp).

The table reveals notable internal restructuring within consumer-goods manufacturing: textiles consolidate output dominance despite reduced employment intensity; wood products lose considerable weight in both employment and output; and manufacturing n.e.c. emerges as a rapidly growing segment. These shifts highlight the sector's increasing heterogeneity and provide important context for interpreting the elasticity patterns that follow.

Table 3

Table 3 Sectoral Shares in Employment and Real Value Added of Constituent Industries of Consumer-Goods Manufacturing, 1991-92 and 2019-20

Industry	Employment Share (%) 1991-92	Employment Share (%) 2019-20	Change in Employment share (pp)	Real Value-Added Share (%) 1991-92	Real Value-Added Share (%) 2019-20	Change in real value added (pp)
Food Products, Beverages and Tobacco	31	30	-1	35	32	-3
Textiles, Textile Products, Leather and Footwear	43	37	-6	33	43	10
Wood and Products of Wood	12	10	-2	15	4	-11
Pulp, Paper, Paper Products, Printing and Publishing	4	6	2	12	8	-4
Manufacturing n.e.c.; Recycling	11	16	7	4	12	8
Consumer Goods Manufacturing Sector	100	100		100	100	

Note. All values are calculated by the author using the India KLEMS Database (January 2024 release). Real value added is measured at constant 2011–12 prices. Shares represent each industry's employment and real value added as a percentage of total consumer-goods manufacturing. Figures rounded to the nearest integer. pp = percentage points.

Table 4 presents the average annual growth rates of key structural variables across the five constituent industries of consumer-goods manufacturing between 1991–92 and 2019–20. Employment growth is generally weak across the sector: textiles record a very low increase (0.1 per cent annually), food products grow at only 0.5 per cent, and wood products register a marginal decline (–0.05 per cent). By contrast, pulp, paper and printing (2.35 per cent) and manufacturing n.e.c. (2.4 per cent) exhibit comparatively stronger employment expansion.

Real value-added growth displays a clearer differentiation. Manufacturing n.e.c. experiences the fastest growth (9.8 per cent), followed by textiles (7.0 per cent) and food products (5.7 per cent). Wood products again lag behind with only 1.8 per cent growth, underscoring its persistent structural weakness.

Capital intensity increases markedly in most industries, reflecting broad-based capital deepening. Textiles (7.8 per cent) and food products (5.9 per cent) show particularly rapid growth in capital per worker, while pulp and paper is the only segment to record a slight decline (–0.7 per cent). Wage growth also varies significantly, ranging from 1.2 per cent in wood products to 7.1 per cent in textiles.

The table highlights a sector characterised by weak employment growth, strong capital deepening, and divergent output performance. Industries such as textiles and manufacturing n.e.c. combine high output and capital-intensity growth with modest employment gains, whereas wood products displays stagnation across all dimensions. These patterns foreshadow the heterogeneity observed later in the employment elasticity estimates.

Table 4

Table 4 Average Annual Growth Rates of Employment, Real Value Added, Capital Intensity, and Wage Rate in Constituent Industries of Consumer-Goods Manufacturing, 1991–92 to 2019–20

Industry	Employment Growth (%)	Real Value Added Growth (%)	Capital Intensity Growth (%)	Annual Wage Rate Growth (%)
Food Products, Beverages and Tobacco	0.5	5.7	5.9	4.4

Textiles, Textile Products, Leather and Footwear	0.1	7	7.8	7.1
Wood and Products of Wood	–0.05	1.8	6	1.2
Pulp, Paper, Paper Products, Printing and Publishing	2.35	5	–0.7	2.6
Manufacturing n.e.c.; Recycling	2.4	9.8	4.5	6

Note. Growth rates represent average annual compound growth for 1991–92 to 2019–20. All values are calculated by the author using the India KLEMS Database (January 2024 release). Employment is measured in thousand persons; Real Value Added is measured at constant 2011–12 prices; Capital Intensity is defined as real capital stock (₹ crore, constant 2011–12 prices) per worker; and the Wage Rate denotes average real annual wages per worker (₹)

DATA AND METHODOLOGY

DATA SOURCE AND SECTOR COVERAGE

The study uses annual industry-level data from the India KLEMS Database (January 2024 release) for the period 1991–92 to 2019–20. The consumer-goods manufacturing sector is defined, following the mapping in Table 1, as comprising five industries: Food, Beverages and Tobacco (NIC 15–16); Textiles, Textile Products, Leather and Footwear (NIC 17–19); Wood and Products of Wood (NIC 20); Pulp, Paper, Printing and Publishing (NIC 21–22); and Manufacturing n.e.c. and Recycling (NIC 36–37). For each industry, India KLEMS provides consistent annual series on employment, real value added and real capital stock, which form the basis for constructing the variables used in the elasticity estimates.

SAMPLE PERIOD AND SUB-PERIODISATION

The empirical analysis spans 1991–92 to 2019–20, covering the post-liberalisation era and ending before the distortions of COVID-19. Following the KLEMS literature, the period is divided into two analytically meaningful phases: 1991–92 to 2002–03 and 2003–04 to 2019–20. Goldar et al. (2017), Aggarwal and Goldar (2019), and Irshad and Qayed (2023) consistently identify 2003–04 as the beginning of a distinct post-reform performance phase, marked by accelerated productivity growth and deeper integration with global markets. This breakpoint is also supported by Ahluwalia (2002), (2018), who notes that several reforms particularly relevant to consumer-goods manufacturing—such as the removal of quantitative restrictions on consumer-goods imports and the dismantling of small-scale industry reservation—were implemented only around 2001–02, implying that the 1990s constituted a transitional period and the early 2000s a shift to a more fully liberalised regime. Together, these strands of evidence justify using the two distinct sub-periods for analysing the evolution of sector-level and industry-level employment elasticities in the consumer-goods manufacturing sector.

VARIABLES AND TRANSFORMATIONS

The analysis uses annual industry-level data on employment (measured in '000 persons) and real value added (₹ crore at constant 2011–12 prices) from the India KLEMS Database (January 2024 release), while capital intensity is constructed as the ratio of real capital stock (₹ crore at constant 2011–12 prices) to employment. All variables entering the regressions—employment, value added and capital intensity—are transformed into natural logarithms so that estimated coefficients have a direct elasticity interpretation and proportional changes are comparable across industries.

ECONOMETRIC SPECIFICATION AND ESTIMATION STRATEGY

To estimate employment elasticity of output for the consumer-goods manufacturing sector, two complementary empirical approaches are used: a sector-level fixed-effects panel model and industry-specific log–log regressions. All variables are in natural logarithms, allowing coefficients to be interpreted directly as elasticities.

1) Sector-Level Panel Estimates

At the sector level, the five constituent industries form a balanced panel over 1991–92 to 2019–20. The unconditional employment elasticity is obtained from the fixed-effects specification:

$$\ln EMP_{it} = \alpha_i + \beta_1 \ln VA_{it} + u_{it}, \qquad (1)$$

where:

- EMP_it= employment in industry iin year t,
- VA_it= real value added,
- α_i= industry fixed effect capturing time-invariant structural characteristics,
- β_1= unconditional employment elasticity of output,
- u_it= error term.

Interpretation of β_1

β_1measures the percentage change in employment associated with a 1% change in output, without accounting for movements in capital intensity.

To assess whether rising capital–labour ratios have altered employment responsiveness, a second specification includes capital intensity:

$$\ln EMP_{it} = \gamma_i + \delta_1 \ln VA_{it} + \delta_2 \ln KI_{it} + v_{it}, \qquad (2)$$

where:

- KI_it= capital intensity (real capital stock per worker),
- δ_1= conditional employment elasticity of output,
- δ_2= elasticity of employment with respect to capital intensity,
- γ_i= industry fixed effect,
- v_it= error term.

Interpretation of δ_1and δ_2

- δ_1captures the employment–output relationship holding capital intensity constant.
- δ_2<0indicates labour-displacing capital deepening;
- δ_2>0indicates labour-complementary capital deepening.

Both (1) and (2) are estimated using analytic weights based on each industry's employment share in 1991–92, giving proportionately greater weight to industries that historically accounted for a larger share of consumer-goods manufacturing employment.

Equations (1) and (2) are estimated for the full period and for the two sub-periods 1991-92 to 2002-03, and 2003-04 to 2019-20 for enabling comparison of how elasticities evolve within

2) Industry-Level Elasticities

To capture heterogeneity across industries, separate regressions are estimated for each of the five constituent industries:

$$\ln EMP_t = \theta_0 + \theta_1 \ln VA_t + \epsilon_t, \qquad (3)$$

where:

- θ_1= industry-specific employment elasticity of output,

No capital-intensity term is included, allowing industry-specific patterns of labour absorption to be observed directly.Equation (3) is also estimated for the full period and for each sub-period, enabling comparison of how elasticities evolve within industries over time.

ELASTICITY AS A DESCRIPTIVE MEASURE

The employment–output elasticities estimated in this paper are interpreted as descriptive measures of how employment responds, on average, to changes in output. This approach is well established in the empirical literature Islam and Nazara (2000), Ali et al. (2017), Basole and Narayan (2020), Roy et al. (2020), where log–log regressions in levels are used to obtain a proportional measure rather than to model a structural time-series relationship. The purpose is to quantify the strength of the employment response over time, not to estimate a behavioural equation or to study long-run equilibrium properties. Consistent with this methodological tradition, the analysis reports the elasticity coefficients as the main results for both the sector-level fixed-effects models and the industry-level regressions.Formal time-series diagnostics—such as stationarity checks or cointegration analysis—

are not undertaken, since, as noted by Ait Ali et al. (2017), p. 12), elasticity estimates of this kind are 'more an accounting measure of the content of employment in each 1% growth and less a robust statistical estimation.'

THE DISTRIBUTION OF OUTPUT GAINS BETWEEN EMPLOYMENT AND LABOUR PRODUCTIVITY

Kapsos (2005) emphasises that, when assessing how output growth translates into labour-market outcomes, it is essential to consider how the resulting gains are divided between employment growth and labour-productivity growth. The value of the elasticity coefficient therefore indicates whether output expansion is accompanied primarily by job creation or by productivity improvements. An important implication of this framework is the inverse relationship between elasticity and labour productivity. Thus, when output is growing, a lower elasticity indicates that most output gains arise from productivity improvements rather than employment expansion, whereas a higher elasticity reflects a more employment-intensive pattern of growth. If elasticity exceeds one, employment grows faster than output, implying declining labour productivity. Conversely, a negative elasticity signals job losses despite rising output—an outcome associated with strong productivity gains or technological change that displaces labour.

Table 5 summarises these patterns under positive value-added growth; the opposite combinations apply when value-added growth is negative.

Table 5

Table 5 Interpretation of Employment Elasticity of Output Under Positive Value-Added Growth

When elasticity of employment with respect to output is...	Implication with positive value added growth rate
Less than 0	Employment falls despite rising output Labour productivity rises
In the range [0,1]	Employment rises, but slower than output Labour productivity rises
More than 1	Employment rises faster than output Labour productivity falls

Note. Adapted from Kapsos (2005). The table summarises the joint behaviour of employment and labour productivity implied by different ranges of employment–output elasticity when real value added is positive.

RESULTS AND DISCUSSION

SUMMARY STATISTICS

Table 6 reports the summary statistics for the variables used in the regression analysis. These values are unweighted, expressed in levels (not logarithms), and rounded to the nearest integer

Table 6

Table 6 Summary Statistics for Employment, Real Value Added, And Capital Intensity in the Consumer-Goods Manufacturing Sector, 1991–92 To 2019–20

Indicator	Obs	Mean	Std. dev	Min	Max
Employment	145	6,631	4394	960	15,173
Real Value Added	145	66,042	68,291	5,440	3,00,167
Capital Intensity	145	6,71,932	7,36,606	44,246	23,87,429

Note. Summary statistics are reported in levels (not logarithms). All figures are rounded to the nearest integer.Employment is measured in thousands of persons. Real value added is measured in ₹ crore at 2011–12 constant prices. Capital intensity is the ratio of real capital stock (₹ crore, constant 2011–12 prices) to total employment.

SECTOR-LEVEL EMPLOYMENT ELASTICITY ESTIMATES

Table 7 reports fixed-effects estimates of employment elasticity with respect to real value added for the aggregate consumer-goods manufacturing sector. The coefficients from Eq. (1) represent unconditional elasticities—showing the proportional response of employment to output without accounting for changes in capital intensity—while Eq. (2) provides conditional elasticities that explicitly control for capital intensity. All regressions include industry fixed effects to net out time-invariant industry characteristics.

For the full period (1991–92 to 2019–20), the unconditional elasticity is 0.12, indicating that a 1 per cent increase in output is associated, on average, with a 0.12 per cent increase in employment. Once capital intensity is incorporated, the elasticity rises to 0.22, while the coefficient on capital intensity is –0.11, suggesting that rising capital–labour ratios dampen employment growth and that the underlying labour-demand responsiveness is stronger than the unconditional estimate implies.

A different pattern emerges in Sub-period I (1991–92 to 2002–03). The unconditional elasticity is 0.17, broadly consistent with a labour-absorbing phase in the 1990s. When capital intensity is included, the elasticity falls to essentially zero (–0.002), while capital intensity exerts a positive effect (0.17). This indicates that during the transition years of early liberalisation—when consumer-goods industries were still partly protected and SSI reservation remained in place—the relationship between output, employment and capital deepening did not follow the pattern observed over the long period.

In Sub-period II (2003–04 to 2019–20), coinciding with the fully liberalised post-2003 regime, the unconditional elasticity becomes negative (–0.07), implying job losses or jobless expansion even as output grew. After conditioning on capital intensity, however, the elasticity becomes positive and sizeable (0.17), whereas capital intensity has a strong negative association with employment (–0.33). This confirms that the outward shift in capital intensity after the early-2000s reforms—documented widely in the literature—substantially suppressed employment growth, and that the underlying responsiveness of employment to output remains positive but is increasingly offset by capital deepening.

Table 7

Table 7 Fixed-Effects Estimates of Employment Elasticitywith Respect to Real Value Added in the Consumer-Goods Manufacturing Sector

Indicator	Eq. (1)		Eq. (2)
Panel A: Full Period (1991–92 to 2019–20)			
Ln (VA)	0.12		0.22
Ln (KI)	—		-0.11
Obs	145		145
Panel B: Sub-Period I (1991–92 to 2002–03)			
Ln (VA)	0.17		-0.002
Ln (KI)	—		0.17
Obs	60		60
Panel C: Sub-Period II (2003–04 to 2019–20)			
Ln (VA)	-0.07	0.17	
Ln (KI)	—	-0.33	
Obs	85	85	

Note. Eq. (1) reports unconditional elasticities (without capital intensity). Eq. (2) reports conditional elasticities controlling for capital intensity. All regressions include industry fixed effects. Coefficients are interpreted as elasticities."—" indicates not applicable.

INDUSTRY-LEVEL EMPLOYMENT ELASTICITY ESTIMATES

Table 8 reports unconditional employment elasticities for each constituent industry of the consumer-goods manufacturing sector, estimated using simple log–log regressions (Eq. 3). The results reveal substantial heterogeneity in how individual industries translate output growth into employment, reinforcing that the aggregate elasticity masks divergent internal dynamics.

During Sub-period I (1991–92 to 2002–03), three industries—Food Products, Textiles, and Pulp and Paper—display positive elasticities (0.288, 0.150, and 0.223 respectively), indicating modest employment gains alongside output expansion. By contrast, Wood and Products of Wood records a strongly negative elasticity (–0.351), suggesting labour-displacing technological or organisational change in the 1990s, while Manufacturing n.e.c. shows a small positive elasticity (0.116).

In Sub-period II (2003–04 to 2019–20), the heterogeneity becomes more pronounced. Food Products and Textiles both exhibit negative elasticities (–0.072 and –0.101), implying that employment contracted even as output continued to grow. Wood Products becomes even more labour-displacing (–0.599), confirming a persistent shift toward capital-intensive modes of production. In contrast, Pulp and Paper and Manufacturing n.e.c. maintain positive elasticities (0.142 and 0.112), although the magnitudes are lower than in the first period, indicating only limited employment intensity.

Over the full period (1991–92 to 2019–20), two broad patterns emerge. First, Wood Products stands out with a consistently large and negative elasticity (–0.521), reflecting sustained labour shedding over nearly three decades. Second, Pulp and Paper and Manufacturing n.e.c. show the strongest long-run employment responsiveness (0.363 and 0.287 respectively), suggesting that these industries have remained comparatively labour-absorbing within the consumer-goods group. Food Products and Textiles, while positive over the full period, show small elasticities (0.085 and 0.089), indicating weak long-run employment intensity despite their importance within the sector.

Taken together, the industry-level estimates demonstrate that the aggregate elasticity for consumer-goods manufacturing conceals divergent trends: some industries exhibit mild employment-absorbing characteristics, while others—most notably Wood Products and, in later years, Textiles and Food Products—display patterns consistent with jobless or labour-saving growth. These results reinforce the need to interpret sector-level elasticities in conjunction with industry-specific dynamics.

Table 8

Table 8 Unconditional Employment Elasticities with Respect to Real Value Added for Constituent Industries of the Consumer-Goods Manufacturing Sector

Industry	Sub-period I (1991-92 to 2002-03)	Sub-period II (2003-04 to 2019-20)	Full period (1991-92 to 2019-20)
Food Products, Beverages and Tobacco	0.288	-0.072	0.085
Textiles, Textile Products, Leather and Footwear	0.15	-0.101	0.089
Wood and Products of Wood	-0.351	-0.599	-0.521
Pulp, Paper, Paper Products, Printing and Publishing	0.223	0.142	0.363
Manufacturing n.e.c.; Recycling	0.116	0.112	0.287
Obs	12	17	29

Note. Estimates are based on Eq. (3), a log–log regression of employment on real value added estimated separately for each industry. Reported values represent elasticity coefficients. N denotes the number of annual observations available for each industry in the respective period. No capital-intensity term is included.

DISTRIBUTION OF OUTPUT GAINS BETWEEN EMPLOYMENT AND LABOUR PRODUCTIVITY: INTERPRETING RESULTS THROUGH THE KAPSOS FRAMEWORK

The elasticity patterns observed across the consumer-goods manufacturing sector can be interpreted through the labour-productivity framework outlined by Kapso (2005), who emphasises that any change in output reflects a combination of employment growth and labour-productivity growth. Industries with negative elasticities—most notably Wood Products and, in the second sub-period, Food Products and Textiles—record rising output alongside declining employment, implying strong labour-saving technological or organisational change. Industries with small positive elasticities, such as Food Products, Textiles and Manufacturing n.e.c. over the full period, display output growth dominated by productivity improvements rather than employment expansion. By contrast, Pulp and Paper and Manufacturing n.e.c. show the highest positive elasticities, indicating a relatively greater contribution of employment growth to output increases.

DISCUSSION: POSITIONING THE FINDINGS WITHIN THE EXISTING LITERATURE

The results for the consumer-goods manufacturing sector broadly align with existing evidence on India's declining employment intensity of growth but also reveal features distinctive to this sectoral grouping. The aggregate elasticities—close to zero without controlling for capital intensity and negative in the post-2003 period—corroborate the findings of Aggarwal and Goldar (2019) and Basole and Narayan (2020), who document a long-run weakening of the output–employment relationship in Indian manufacturing. The strong dampening effect of capital intensity further reinforces Basole and Narayan's conclusion that rising capital–labour ratios, rather than technological inevitability, account for much of the jobless pattern of post-reform manufacturing growth.

At the industry level, the pronounced heterogeneity observed here has not been previously documented for the KLEMS-defined consumer-goods sector. While Wood Products and Textiles show increasingly labour-displacing growth, Pulp and Paper and Manufacturing n.e.c. retain modest employment-absorbing capacities. This divergence suggests that structural characteristics—technology, scale, supply-chain linkages, and product composition—continue to shape labour-market outcomes within the sector. The results are also consistent with the Kapsos (2005) framework, where low or negative elasticities imply that output growth is driven primarily by labour-productivity gains rather than by employment expansion.

The evidence confirms that the consumer-goods sector—historically one of India's major labour-intensive manufacturing segments—has become progressively less employment-intensive. The combination of near-zero sectoral elasticity, negative elasticities in several constituent industries, and strong sensitivity to capital deepening indicates a structural shift toward labour-saving growth. These findings fill an important empirical gap by providing the first KLEMS-consistent estimates of employment elasticity for the consumer-goods sector and its constituent industries.

CONCLUSION

This paper provides the first systematic estimation of employment–output elasticities for India's consumer-goods manufacturing sector using a NIC/KLEMS-consistent industry classification. By combining sector-level fixed-effects regressions with industry-level log–log estimates over 1991–92 to 2019–20, the study offers new evidence on how employment responsiveness within this historically labour-intensive segment has evolved during the post-liberalisation period.

Three main findings emerge. First, at the aggregate level, the consumer-goods sector exhibits extremely weak employment responsiveness. Elasticities are close to zero over the full period and turn negative in the post-2003 phase, indicating that output growth has increasingly been achieved without commensurate employment expansion. Second, controlling for capital intensity substantially increases the estimated elasticities, reaffirming that rising capital–labour ratios—not an inherent technological inevitability—have been central to the sector's declining employment intensity. Third, substantial heterogeneity exists across constituent industries: Wood Products and Textiles display increasingly labour-displacing growth, whereas Pulp and Paper and Manufacturing n.e.c. retain modest employment-absorbing capacities. These divergences highlight the differentiated technological structures, scale economies and market conditions within consumer-goods manufacturing.

The results point to a structural shift toward labour-saving growth in a sector long regarded as a major source of employment. They also fill an empirical gap by providing disaggregated elasticity estimates for a clearly defined consumer-goods sector, complementing earlier studies that analyse manufacturing as a whole or broad use-based industrial groups. Although the elasticities estimated here are descriptive measures rather than structural causal parameters, they offer meaningful insights into the employment content of growth and the role of capital deepening across industries.

For policy, the findings suggest that improving employment outcomes in consumer-goods manufacturing will require more than accelerating output growth. Policies that strengthen labour-absorbing activities—such as facilitating scale expansion in labour-intensive segments, easing supply-chain bottlenecks, promoting technology adoption that complements rather than displaces labour, and supporting productivity improvements in small and medium enterprises—are likely to be critical. A deeper understanding of firm-level dynamics, wage behaviour and the role of global value chains may further enrich future research.

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