



STRUCTURAL TRANSFORMATION AND SECTORAL DYNAMICS IN RAJASTHAN: A COMPARATIVE ANALYSIS WITH THE INDIAN ECONOMY

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Abstract

Rajasthan, one of India's largest states, has experienced significant structural changes in its economy, transitioning from an agrarian base to a more diversified one, including industrialization and services. This study investigates the sectoral evolution of Rajasthan's economy by analysing changes in the Net State Value Added (NSVA) and Compound Annual Growth Rates (CAGR) of sectoral shares between 2011–12 and 2023–24. It explores how the state's economic structure has shifted over time and benchmarks this transformation against the national trajectory. The analysis reveals that while Rajasthan is gradually transitioning from a primary sector-dominated economy to one with an increasing emphasis on services, the pace of this transformation lags behind the national average. The primary sector, particularly agriculture, continues to play a dominant role in the state's economy, contributing significantly more to NSVA than the national average, though its relative share is declining. The secondary sector shows inconsistent growth, reflecting the need for stronger industrial development strategies. The service sector, though expanding, remains under-leveraged compared to the national level. These findings underscore the need for a comprehensive policy approach to foster balanced sectoral development. Key policy areas include agricultural modernization, industrial promotion, human capital enhancement, and service sector expansion. By addressing these areas, Rajasthan can better align with national economic trends and promote sustainable and inclusive growth.

Keywords: Structural transformation, Net State Value Added (NSVA) and Compound Annual Growth Rates (CAGR)

INTRODUCTION

Rajasthan, a state renowned for its rich cultural history and diverse heritage, is currently undergoing a profound period of structural change, which is reshaping its economic, social, and political frameworks. Over recent decades, the state has witnessed significant shifts driven by factors such as urbanization, industrial growth, and changes in agricultural practices. These transformations have not only impacted the state's economic structure but also influenced demographic patterns, labor markets, and regional disparities. This paper aims to examine the various facets of structural change in Rajasthan, analyzing the underlying drivers, key impacts, and the challenges that accompany this transition. By investigating sectors like agriculture, industry, and services, the study seeks to offer an in-depth analysis of how Rajasthan is adapting to its evolving structure and the consequences for sustainable development and equitable growth in the state.

Structural transformation in an economy is defined as the reallocation of economic activity across three broad sectors (agriculture, manufacturing, and services) that accompany the process of modern economic growth. Major structural shifts in output and employment accompany a sustained and rapid growth of per capita output of a country has been a well-known fact since the original studies of economic growth by Fisher, Clark and Kuznets. Such structural shifts have been seen as mechanisms influencing the pace of growth as well as being the result of growth. Either of two tripartite divisions of the economy closely resembling each other—the primary-secondary-tertiary or agriculture-industry-services divisions—have been used to describe the typical pattern of structural change associated with what Kuznets called modern economic growth.

REVIEW OF LITERATURE

Research has been conducted since long across the world to study the process of structural change/transformation in various economies.

Dietrich (2012) in his study has made an attempt to find if economic growth caused structural change, or vice-versa. The article examined through a Granger causality test in a panel environment to examine the association of economic growth with structural change, with respect to employment or real value added shares. The study considered a group of seven OECD countries i.e. France, Germany, Italy, Japan, the Netherlands, the U.K., and the U.S. The time period was 1960 to 2004. The findings highlighted that growth had a greater influence on structural change in terms of employment, whereas, structural change in real value added had a higher influence on growth. On the whole, the study emphasizes that growth is both a cause as well as a consequence of structural change.

Bah (2008) undertook a comparative study to study the process of structural transformation in developed and developing economies. He examined the dissimilarities in major features in the process of development among rich and poor economies that can highlight the sources of the large disparities in cross-country income. The analysis conducted covers nine developed nations for the duration 1870 to 2000 and 38 developing countries for the duration 1965-2000. The author used sectoral output shares at current prices and the technique of fixed effects panel data regression. It was found that the structural transformation processes in developing economies

digressed from the path undertaken by the developed countries on two lines. Firstly, the relationship between variations in the shares of sectoral output and variations in log of GDP per capita and secondly, in the levels of shares of sectoral output for a given per capita GDP. A lot of diversification was witnessed in the processes of structural transformation experienced by developing economies. Also, structural transformation took place even during phases of economic stagnation or decline.

Duarte and Restuccia (2007) investigated the process of structural transformation and role of sectoral differences in labor productivity in determining the time path of aggregate productivity among nations for the time period 1956 to 2000. It was done by constructing a panel data set of 29 nations which were at varying phases in the process of structural transformation. Further, developing a simple general equilibrium model of the structural change with the three main sectors - agriculture, industry, and services; the model was calibrated to the structural transformation of the United States from 1956 to 2000 to measure sectoral labor productivity differences among countries. Three basic facts were highlighted by the data. Firstly, nations followed a general path of structural transformation defined by a decreasing share of workforce in agriculture over time, an increasing share of workforce in services, and a hump-shaped share of workforce in industry. Secondly, there existed a considerable lag in the process of structural transformation for few nations and this lag was linked with the level of relative income. Thirdly, there were substantial and orderly differences in sectoral growth rates of labor productivity among nations.

Gordan and Gupta (2004) analyzed the reasons behind the growth of services sector in the Indian economy for the time period 1951 and 2000. It was found that the share of agriculture sector in GDP declined from 58 percent to 25 percent, while that of industry rose from 15 percent to 27 percent with the share of services increasing from 27 percent to 48 percent. Notably, the 1990s witnessed an 8 percent increase in the share of services in GDP, in comparison to a collective increase of 13 percent during the past 50 years i.e. 1951–90. On the other hand, the share of industry remained constant over the same period. This pattern of the services sector growing at a rate faster than agriculture and industry was a general phenomenon witnessed in many countries. As a consequence, the services sector's share in GDP has become substantial in India when compared with other nations at same degree of development. Various factors, for instance; economic reforms, technological advancements, high income elasticity of demand, greater input usage of services played a significant role in boosting the growth of services sector.

Venkatramaiah, Kulkarni and Argade (1984) in their study have examined the structural changes that have taken place in the Indian economy covering the time period 1951 to 1963 i.e. the initial decade of the plan period using the input-output tables. It was found that over the period under study, the proportion of inter-industry use to the total output in the economy was around 34 percent and this proportion was almost stagnant or at best showed only a marginal increase. The proportion of non-agricultural products that went to inter-industry use showed a gradual rise increasing from 24 percent in 1951 to 37 percent in 1963.

NEED OF THE STUDY

Rajasthan, one of India's largest states, has experienced significant structural changes in its economy, transitioning from an agrarian base to a more diversified one, including industrialization and services. However, Rajasthan's growth has been slower compared to the national average. While India has seen rapid urbanization and service-sector expansion, Rajasthan has faced challenges such as water scarcity, slow industrial growth, and high poverty rates. The state's developmental path highlights the need for targeted policy interventions to address regional disparities, improve infrastructure, and enhance human development. This study aims to understand these shifts and suggest strategies for sustainable, inclusive growth in Rajasthan.

STATEMENT OF THE PROBLEM

The structural transformation in Rajasthan presents a complex challenge, as the state grapples with shifting economic patterns, regional disparities, and socio-economic development. Despite its vast resources, Rajasthan's growth trajectory has been slower compared to the national average, with significant gaps in industrialization, urbanization, and human development indicators. The problem lies in understanding the causes and consequences of these structural shifts and their impact on Rajasthan's overall development, so as to formulate effective policies that foster sustainable and inclusive growth, and improve the quality of life for its population.

OBJECTIVES

The primary objectives of this study are:

- To analyze the changing sectoral composition of Rajasthan's economy over time.
- To compare Rajasthan's sectoral trends with the national economy.
- To evaluate the growth performance using CAGR of sectoral shares.

DATA AND METHODOLOGY

The study will primarily utilise secondary data sourced from the MOSPI and Statistical Abstract of Rajasthan, which provides detailed information on various economic indicators, including sectoral contributions to the state's Net State Value Added by economic activity at constant (2011-12) prices. The methodology will involve analysing the percentage share of the primary, secondary, and tertiary sectors in Rajasthan's Net State Value Added by economic activity over the period 2011-12 to 2023-24. Additionally, the Compound Annual Growth Rate (CAGR) of sectoral shares will be calculated to assess the growth trends and shifts in the importance of each sector within the state's economy. This analysis will help in understanding the changing dynamics of economic development and the role each sector plays in the overall growth of Rajasthan.

Table 1 Sectoral Composition of Net State Value Added (2011-12 to 2023-24) (Percent)

	Rajasthan			India		
	Primary sector	Secondary Sector	Tertiary Sector	Primary sector	Secondary Sector	Tertiary Sector
2011-12	33.97	27.42	38.61	22.75	27.94	49.31
2012-13	36.79	22.60	40.61	22.27	27.34	50.39
2013-14	37.86	20.71	41.43	22.36	26.75	50.90
2014-15	37.15	20.82	42.03	21.75	26.16	52.09
2015-16	37.06	22.03	40.92	20.81	26.61	52.58
2016-17	38.49	21.15	40.35	21.20	26.02	52.78
2017-18	36.81	20.61	42.58	21.30	26.16	52.54
2018-19	31.15	22.49	46.35	20.73	26.03	53.25
2019-20	32.27	22.84	44.89	21.25	23.88	54.87
2020-21	36.33	22.87	40.80	23.46	24.58	51.96
2021-22	33.53	23.58	42.89	22.11	26.07	51.82
2022-23	32.49	23.50	44.01	21.39	24.43	54.18
2023-24	31.21	24.93	43.86			

Source:
Author's own
calculations
from data from
MOSPI

Sectoral Composition of Net State Value Added: A Comparative Analysis of Rajasthan and India

An examination of table 1 shows the sectoral composition of Net State Value Added (NSVA) in Rajasthan from 2011–12 to 2023–24 reveals significant structural trends in the state's economy. Rajasthan's economy continues to reflect a high dependence on the primary sector, which comprises agriculture and allied activities. In 2011–12, the primary sector accounted for 33.97% of Rajasthan's NSVA. Although this share declined slightly over time, it remained substantial at 31.21% in 2023–24. This indicates a relatively slow pace of structural transformation, where agriculture still plays a dominant role in the state's economic output. Notably, the primary sector's share fluctuated during this period, peaking at 38.49% in 2016–17, which can be attributed to seasonal variations, climatic conditions, and fluctuations in agricultural productivity.

The secondary sector in Rajasthan, which includes manufacturing, construction, and utilities, has exhibited a more modest and fluctuating trend. Its share declined from 27.42% in 2011–12 to a low of around 20.61% in 2017–18, before gradually recovering to 24.93% in 2023–24. This sector has not exhibited robust or consistent growth, suggesting limitations in industrial development or challenges in sustaining manufacturing activity. The recovery in recent years may reflect state-led initiatives in infrastructure and industrial promotion but remains modest compared to more industrialized states.

In contrast, the tertiary sector in Rajasthan has shown a steady and consistent rise, growing from 38.61% in 2011–12 to 43.86% in 2023–24. This increase reflects the expanding role of services such as trade, transport, communication, banking, and public administration. The growth in the services sector signals a shift toward a

more diversified economy, yet its contribution remains lower than the national average, indicating untapped potential for service-led development in the state.

When compared to the all-India figures, the divergence in structural composition becomes clearer. At the national level, the primary sector's share declined from 22.75% in 2011–12 to 21.39% in 2022–23, highlighting a faster structural shift away from agriculture. This contrasts sharply with Rajasthan, where the primary sector still accounts for over 31% of economic activity. Both Rajasthan and India experienced a decline in the secondary sector's share, though India's secondary sector started at a slightly higher share and declined from 27.94% in 2011–12 to 24.43% in 2022–23, a pattern broadly in line with Rajasthan's trajectory.

The most striking difference lies in the performance of the tertiary sector. At the national level, the tertiary sector's share rose from 49.31% in 2011–12 to 54.18% in 2022–23, making it the dominant sector of the Indian economy. Rajasthan, while showing growth in this sector, lags behind with a 43.86% share in 2023–24. This suggests that while Rajasthan is transitioning toward a service-oriented economy, it has not yet achieved the level of transformation seen at the national level. The slower pace of service sector expansion may be due to lower urbanization, skill gaps, or infrastructure constraints that inhibit the growth of knowledge-based and high-value services.

Therefore, Rajasthan's economic structure reflects a partial and uneven transition. While there is clear growth in the tertiary sector and some recovery in the secondary sector, the state's continued reliance on the primary sector stands in contrast to the national trend of service-sector dominance. Bridging this gap would require focused policy interventions to modernize agriculture, stimulate industrial growth, and accelerate the development of the services sector to align more closely with national economic dynamics.

**Table 2. Compound Annual Growth Rate of Sectoral Shares: Rajasthan and India
(2011-12 to 2022-23)**

	RAJISTHAN			INDIA		
	Primary Sector	Secondary Sector	Tertiary Sector	Primary Sector	Secondary Sector	Tertiary Sector
2011-12						
2012-13	11.80	-14.89	8.62	10.87	10.81	15.71
2013-14	8.22	-3.65	7.27	13.03	10.14	13.73
2014-15	4.78	7.34	8.32	7.85	8.42	13.45
2015-16	6.55	13.02	4.00	4.73	11.36	10.51
2016-17	10.22	1.88	4.65	13.33	8.76	11.65
2017-18	0.17	2.10	10.53	11.58	11.67	10.53
2018-19	-14.38	10.38	10.13	7.57	9.98	12.05
2019-20	9.29	7.15	2.19	9.43	-2.04	10.02
2020-21	8.52	-3.51	-12.42	8.06	0.72	-7.33
2021-22	1.64	13.60	15.81	12.65	26.78	19.19
2022-23	4.13	7.11	10.27	9.75	6.29	18.62
2023-24	2.65	13.30	6.45			

Source: Author's own calculations from data from MOSPI

Compound Annual Growth Rate of Sectoral Shares: Rajasthan and India

An analysis of the Compound Annual Growth Rate (CAGR) of sectoral shares in Rajasthan from 2012–13 to 2023–24 as depicted in table 2 provides insight into the structural dynamics and economic resilience of the state's economy. The primary sector, though consistently a significant component of Rajasthan's economic structure, demonstrates marked volatility in growth performance over the period. The CAGR for the primary sector was notably high in the initial years, such as 11.80% in 2012–13 and 10.22% in 2016–17. However, it also experienced sharp negative growth in certain years, most strikingly –14.38% in 2018–19. These fluctuations reflect the state's strong dependence on agriculture, which is inherently susceptible to monsoonal variability, droughts, and other climatic disturbances. Although some rebound years followed (e.g., 9.29% in 2019–20), the overall volatility underscores the fragile nature of primary sector growth in the state.

The secondary sector in Rajasthan, comprising manufacturing, construction, and utilities, presents a mixed trajectory. After a steep contraction of –14.89% in 2012–13, the sector saw a recovery phase, with high growth years such as 13.02% in 2015–16 and 13.60% in 2021–22. However, this growth has not been steady; certain years recorded minimal or even negative growth (e.g., –3.51% in 2020–21), indicating an unstable industrial environment. This erratic trend points to structural constraints in Rajasthan's industrial development, possibly due to infrastructure deficits, limited diversification, or fluctuations in investment and policy implementation.

In contrast, the tertiary sector in Rajasthan has demonstrated more sustained and robust growth over the same period. Service sector CAGR remained positive throughout, achieving particularly high rates in 2021–22 (15.81%) and 2017–18 (10.53%). While there was a decline during the pandemic-affected year of 2020–21 (–12.42%), the sector rebounded quickly. The overall growth trajectory suggests an emerging dominance of services in Rajasthan's economic landscape, driven by sectors such as trade, transport, communication, and public administration. The increasing contribution and resilience of the tertiary sector highlight its role as a stabilizing force in the state's economy.

When compared with national trends, several key contrasts emerge. At the all-India level, the primary sector's CAGR exhibits a more stable pattern, with consistently positive growth across most years. India avoided the extreme negative dips seen in Rajasthan, recording moderate to strong growth in years such as 13.33% in 2016–17 and 12.65% in 2021–22. This suggests that India's broader agricultural base and more diversified agro-climatic zones help mitigate risks associated with climatic events, leading to more predictable growth.

The secondary sector at the national level also outperformed Rajasthan in terms of stability and strength. India recorded sustained double-digit growth in several years, notably 11.36% in 2015–16 and an impressive 26.78% in 2021–22. Only one year (2019–20) saw negative growth (–2.04%), indicating the sector's general resilience. This comparatively strong performance points to more developed industrial bases, better infrastructure, and a wider spread of manufacturing hubs across Indian states, which shield the national industrial sector from regional shocks.

India's tertiary sector further solidifies its role as the leading growth engine of the economy. With consistently high CAGRs — reaching 19.19% in 2021–22 and maintaining double-digit growth in most years — the services sector at the national level shows remarkable dynamism and scale. The robustness of India's service sector, supported by a strong IT industry, expanding digital economy, financial services, and government programs, provides a steady growth anchor. Even during the pandemic year of 2020–21, when contraction occurred (–7.33%), the sector demonstrated a quicker recovery than its counterpart in Rajasthan.

Thus, Rajasthan's CAGR patterns reveal an economy in a transitional phase, with persistent volatility in the primary sector, unstable yet recovering performance in the secondary sector, and growing momentum in the tertiary sector. Compared to India, Rajasthan's growth appears less stable and more vulnerable to external shocks, particularly in agriculture and industry. India's more diversified and integrated economic structure facilitates more consistent and broad-based growth across all sectors. This comparison underscores the need for Rajasthan to reduce its dependency on agriculture, enhance industrial capacity, and further develop its service economy to achieve more balanced and sustainable economic growth.

CONCLUSION

The comparative analysis of Rajasthan and India highlights the uneven pace of structural transformation in Rajasthan's economy. While there has been progress in shifting toward a service-oriented structure, the state remains heavily dependent on the primary sector. Greater policy emphasis on diversifying industrial activity and expanding service-sector infrastructure is essential. Rajasthan must also invest in human capital and innovation to drive inclusive and resilient economic growth aligned with national trajectories.

POLICY IMPLICATIONS

The findings of this study yield several key policy implications for Rajasthan's economic development:

1. **Diversification of the Primary Sector:** Given the continued reliance on agriculture, it is imperative to modernize and diversify agricultural activities. Investment in irrigation infrastructure, promotion of high-value crops, agro-processing industries, and crop insurance mechanisms can enhance productivity and reduce volatility.
2. **Strengthening the Secondary Sector:** The erratic growth in the industrial sector highlights the need for targeted interventions. Rajasthan should focus on attracting private investment in manufacturing through industrial corridors, special economic zones, and public-private partnerships. Simplifying regulatory processes and improving logistics infrastructure will also be crucial.
3. **Boosting the Service Sector:** With the service sector emerging as a consistent driver of growth, the state should enhance investments in digital infrastructure, education, and vocational training. Promoting

sectors like tourism, IT services, financial services, and logistics can generate employment and accelerate economic modernization.

4. **Resilience Planning for Agricultural Shocks:** Rajasthan's heavy dependence on monsoon-driven agriculture makes it vulnerable to climate shocks. Developing a robust climate resilience strategy, including early warning systems, drought-resistant crops, and climate-smart agriculture practices, will be essential.
5. **Human Capital Development:** Across sectors, workforce skill enhancement is necessary. Expanding technical education, industry-academia linkages, and entrepreneurship training can improve labor market outcomes and support sectoral shifts.
6. **Urbanization and Infrastructure Development:** To support service and industrial growth, strategic urbanization and infrastructure development are necessary. This includes strengthening transportation networks, industrial parks, smart cities, and digital connectivity.
7. **State-Center Coordination:** Rajasthan should align its development strategies with national schemes and seek central support for initiatives that enhance competitiveness, such as the Production Linked Incentive (PLI) scheme, Make in India, and Digital India.

Overall, Rajasthan needs a multidimensional policy approach that enhances productivity in agriculture, revitalizes industrial growth, and unlocks the full potential of its service economy. Balanced regional development and inclusivity should guide this transformation.

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