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Role of Productive Sectors in Driving Socio-Economic Advancement: Identifying Critical Factors Using PLS-SEM

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ABSTRACT: The study focused on various areas that have contributed towards Tamil Nadu's socio-economic enhancement. Partial Least Squares Structural Equation Modelling (PLS-SEM) has been used to determine the significant elements that influence social and economic advancement. The Reserve Bank of India's (RBI) Handbook of Statistics on Indian States is the basis of the socio-economic data for Tamil Nadu. As it gives permission for us to inspect the properties of several sectors, such as agriculture, power, as well as industry, and their contributions to the state gross domestic product, the data sourced for this study spans the years 1991 to 2021. The outcome of the research indicates that agriculture and industry play a pivotal role in boosting Tamil Nadu's economy which also helps the state's social progress. However, power sector is also a major contributor. These sectors when combined, helps shape the state's overall progress. The output of this study helps policymakers to foresee those sectors that can be focused by the state to invite investments. Sectors like Agriculture, Industry, Power are key drivers of Tamil Nadu's economy and social progress. Investments in these sectors will uplift the state's socio-economic existing status and when strategically planned shall help Tamil Nadu achieve sustained socio-economic growth. The novelty of this study stems from application of PLS-SEM to long-term data that can provide valuable insights. It identifies critical sectors that contribute to the state's development.

Keywords: sectoral analysis, economic development, social progress, agriculture, PLS-SEM

I. INTRODUCTION

The Tamil Nadu state has envisioned an ambitious target of reaching trillion-dollar economy by 2030 through its "Vision 2030' strategic plan which sets its path focused on industrial development, upskilling, infrastructural growth and social inclusivity. It is to be noted that the state of Tamil Nadu has been contributing close to about 10% of India's GDP. This is possible due to strong support from multiple sectors like Information Technology, Textiles, and Automotive [1]. Also, the tourism has ranked second in domestic tourist arrivals in 2019 [2]. Tamil Nadu has showcased itself in the Good Governance Index, 2019. Additionally, the state has invested in infrastructure sector enhancing transportation and power sector as well. All this is expected to lead the state into sustained socio-economic growth.

The need for an in-depth study of the state's economic situation is strongly being considered despite its achievements due to challenges cropping up in agricultural and manufacturing due to escalation of costs, supply chain disruptions tending to slow growth. The agricultural sector, for example, grew at just 1.9% in 2019-20, much lower than Tamil Nadu's overall GDP growth of 7.1%. Given that, agriculture remains a key economic driver, not just for the state but for the country as a whole [3]. Likewise, Tamil Nadu's manufacturing sector, a major contributor to the state's economy, also faced difficulties due to external pressures and internal inefficiencies [4]. These issues certainly demand a comprehensive study to assess the performance of key sectors while exploring the opportunities for economic expansion and revenue generation.

The motivation behind this study arises from the immediate need to understand the evolving economic landscape of Tamil Nadu, more particularly in light of the state's ambitious trillion-dollar target by the year 2030. Though, Tamil Nadu has demonstrated significant economic progress, recent trends in key sectors, as discussed above, like the slowdown in agriculture and manufacturing, raise concerns regarding the sustainability of economic growth. Furthermore, with global economic shifts and steadily increasing intense competition, identifying the critical factors that drive both economic output and social progress are inevitable. By addressing

the above-mentioned concerns, the study seeks to provide valuable insights that can shape Tamil Nadu formulate and align its policies and foresee investments with its long-term development goals, ensuring inclusive and balanced growth across sectors.

This study aims to elucidate the major contributors towards Tamil Nadu's GDP and uncover those critical factors influencing the state's economic growth and social progress, with a special focus on agriculture, industry, and power. By analyzing and interpreting data, from 1991 to 2021, this study provides actionable insights for policymakers to seek growth, optimize resources, and enhance the quality of life for Tamil Nadu's population. Therefore, understanding these factors becomes crucial for formulating the state's economic strategy and ensuring sustainable development in the coming years [5-6].

II. LITERATURE REVIEW

The financial ecosystem of Tamil Nadu, similar to that of many other Indian states, is characterized by disparities and challenges, very specifically, in terms of socioeconomic progress and equitable development. The existing and available literature establishes the complex link between economic growth and human development, highlighting persistent regional inequalities despite efforts at state planning over the past decades.

1. REGIONAL DISPARITIES AND ECONOMIC GROWTH

weighs the significant disparities in socioeconomic progress among Indian states [7], arguing that while economic growth, measured by indicators like GDP, is essential, the broader aim should be to enhance human capabilities, a factor that has been historically neglected in the country. The study also points out the persistence of regional inequalities, even after decades of state planning. Study in [8] highlights a substantial increase in the variation of state growth rates especially, after the economic reforms of the 1990s, with agriculture serving as a foundational component establishes that it positively impacts industrial and service sector performance.

2. SOCIAL INFRASTRUCTURE AND HUMAN DEVELOPMENT

It is evident that social infrastructure influences the economic outcomes very much. Researchers [9] observes that while social progress improved in India during the 1990s, the pace was sluggish and inadequate, indicating the dire need for more focused efforts. Study in [10] highlights that economic growth, though beneficial, has disproportionately favored the affluent class, leaving the poor without any visible help. Challenge the notion that higher per-capita income directly correlates with well-being [11]. Also, suggesting that various factors influence human development outcomes, including governance, coupled with historical human development, plays a vital role in forming current socioeconomic progress [12].

3. REGIONAL DEVELOPMENT AND INFRASTRUCTURE

Infrastructure disparities across regions also significantly influence economic growth. Study in [13] highlight the uneven growth patterns across Indian states, with Southern India, including Tamil Nadu, generally performing better in socioeconomic terms compared to other states. Study in [14] further emphasize the need of infrastructure in fueling economic development, a factor highly relevant for Tamil Nadu, as infrastructure advancements lead to sustainable growth. The role of infrastructure is also given importance in the work of [15], who link financial development to improvements in human development, stressing the critical influence of factors such as broad money supply.

4. IMPLICATIONS FOR TAMIL NADU'S FINANCIAL ECOSYSTEM

The literature focuses on the persistent variations in socioeconomic development across Indian states, with Tamil Nadu often cited as both a success story and a region facing ongoing challenges. The state's financial ecosystem, driven by agriculture, industry, and power, reflects broader national trends of unequal development. Nevertheless, the state of Tamil Nadu developed a unique economic model for growth and development – Dravidian Model, which combines economic growth with social justice promising a much more inclusive development.

5. GAP IN THE LITERATURE AND NEED FOR THE STUDY

Existing literature has examined national and inter-state disparities in economic growth and human development, with scholars such as [1, 2, 7] highlighting persistent inequalities across regions. Several studies have independently analyzed the influence of agriculture, industry, or infrastructure on development outcomes

[10, 13]. However, few have approached these sectors within an integrated empirical framework, especially one that leverages state-specific, long-term data.

There remains a noticeable gap in research that simultaneously explores the contributions of key sectors to both economic output and social progress, particularly through advanced methods like PLS-SEM, it is the most useful approach employed to simulate intricate relationships with sparse time series data. This study addresses that gap by developing a composite empirical model that connects productive sectors agriculture, industry, and power—with broader development outcomes. Using three decades of data specific to Tamil Nadu, it provides actionable policy insights supported by Importance-Performance Map Analysis (IMPA). In doing so, the study advances both academic understanding and practical policymaking, offering a scalable framework for other Indian states aiming to achieve inclusive and sustainable growth.

This study's main goal is to determine and evaluate the significant sectoral contributors that have an influence on Tamil Nadu's social advancement and Gross State Domestic Product (GSDP) over a 30-year span (1991–2021). The study aims to:

- Analyze how industrial and agricultural activity affects the GSDP of each sector.
- Assess the contribution of sectoral GSDP to social indicators such as literacy, poverty, and unemployment.
- Evaluate the role of enabling variables like power availability, bank credit, and fiscal deficit in shaping economic and social outcomes.

III. METHODOLOGY

1. CONCEPTUAL AND THEORETICAL FRAMEWORK

This study conceptualizes economic development as a function of sectoral output, while social development is reflected in improvements in literacy, employment generation, and poverty alleviation. The core assumption is that sectoral growth in agriculture and industry, supported by infrastructure (especially power), bank credit availability, and sound fiscal management, drives sustained economic and social transformation. This framework connects economic productivity with human development, thereby aligning sectoral progress with inclusive growth outcomes.

The theoretical grounding of this study draws on a synthesis of established economic development models:

- Endogenous Growth Theory: [16] highlighted the role of internal factors such as human capital, innovation, as well as investment in driving long-term economic growth. In Tamil Nadu, amplified industrial output, infrastructure investments, and agricultural advancements align with this theory, signifying that growth stems from within the state's productive capabilities.
- Lewis Dual Sector Model: Arthur Lewis's prototype highlights the transition of labor from low-productivity agricultural sectors to high-productivity industrial sectors [17]. Tamil Nadu's transformation, particularly in manufacturing hubs like Coimbatore and Chennai, follows this path, where surplus rural labor has been absorbed into mounting industrial regions.
- Modern Infrastructure Theory: It speculates that infrastructure, especially electricity as well as transport is a fundamental enabler of industrial growth as well as improved living standards. [18] shows that power infrastructure is vital not only for productivity but also directly influences household welfare and employment.
- Human Development Approach: Ability of Amartya Sen's approach highlights that growth must go beyond income actions to comprise education, health, as well as other social indicators [19]. As it brings into line with the study's enclosure of the study's social progress as a core construct, measured through literacy rates, poverty reduction, as well as unemployment levels.

The theoretical synthesis defends the inclusion of factors such as agriculture, industry, and power as core explanatory constructs, whereas it also blends the roles of bank credit and fiscal balance to allow or constrain factors within the development model. Additionally, various numerical explorations are delivered with a robust foundation for this study:

- Agriculture remains a very important keystone of Tamil Nadu's economy. They work in [20] highlights its implication in providing livelihoods to over 50% of the population, while [3] validate its ongoing relevance to GDP contribution despite a relative decline in growth rate.
- Industry has shown considerable strength in Tamil Nadu, particularly in sectors like textiles, automobiles, and IT services. Study in [1] noted that industrial development is a key driver of employment and regional income. Further, [20] recognized Tamil Nadu as "the Detroit of India" for its strong manufacturing base.

- Power Infrastructure has been empirically linked to both economic output and social welfare. Study [13] found that rural electrification enhances income and living standards. Study [21] reported improvements in SME productivity and employment with better power access.
- Bank Credit has been emphasized as a driver of investment and business development. Studies [12, 22] report confirm the positive correlation between access to credit and MSME growth, which in turn supports employment generation and economic stability.
- Fiscal Deficit, on the other hand, poses a potential constraint. [10] found that higher fiscal deficits dampen GDP growth and social investment, and [23] cautions against inflationary pressures and reduced public welfare spending arising from unsustainable deficits.

Furthermore, studies by [24-25] reinforce that financial and infrastructural development are essential drivers of regional development. Tamil Nadu's relatively stronger performance compared to other states is often attributed to sustained investment in these enablers, although disparities persist across districts. While these studies provide useful sectoral insights, most lack an integrated analytical model that empirically connects these sectors to both economic and social outcomes at the state level. This study addresses this empirical gap by adopting a PLS-SEM-based approach to quantify sectoral impacts on both GSDP and social progress, using long-term time series data specific to Tamil Nadu. Based on the above literature review, the theoretical framework for the study has been developed (Figure 1).

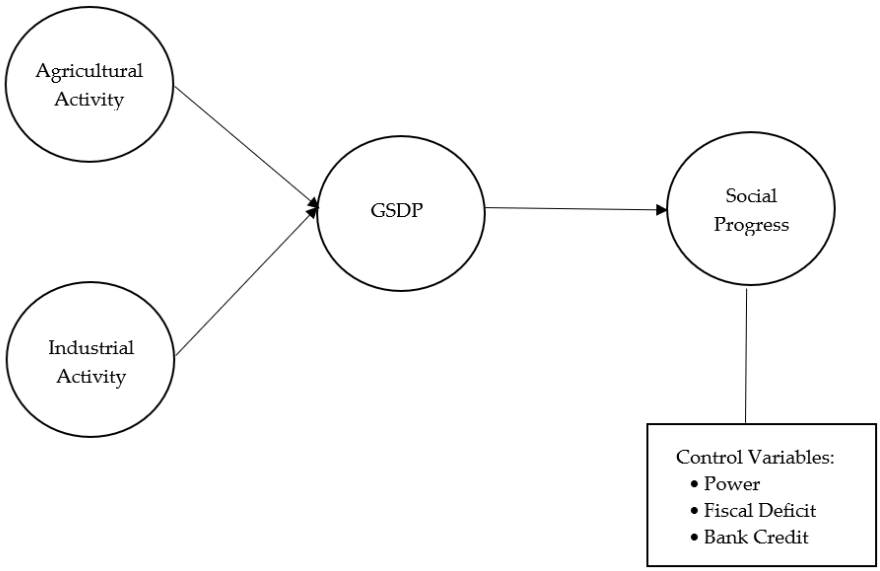

FIGURE 1. Theoretical framework of the study.

2. STUDY VARIABLES

2.1 Agricultural Activity

There has been plethora of variables reflect the agricultural activity of a state. We have selected six variables which we feel as the basis of agricultural activity: Sown Area, Irrigated Area, Food Grains and Non-Food Grains production, Yield of Food Grains and Non-Food Grains. Each of these variables has several sub-variables into them, and to accommodate all of them in our research model, we used repeated indicator approach and converted constructs into variables and the Z value of these variables were used in the main model.

2.2 Industrial Activity

Similar to agricultural activity, there are several variables reflect a state's industrial activity. We have selected five variables which we feel as the basis of industrial activity: Working Capital, Total Capital Employed, Production Capacity, Activity, and Capital Formation. Each of these variables have several sub-variables into them, and to accommodate all of them in our research model, we used repeated indicator approach and converted constructs into variables and the Z value of these variables were used in the main model.

2.3 *Gross State Domestic Product (GSDP)*

The Gross State Domestic Product is the main construct of this study, which is formative in nature. We want to identify the impact on sector-wise GSDP hence we choose five major sectors which forms the GSDP of the state: Agriculture, Banking & Insurance, Construction, Services, and Industry (including manufacturing & allied activities apart from construction, banking, insurance and services).

2.4 *Social Progress*

We have chosen three constructs to represent the social progress of the state: Unemployment, poverty, and literacy. Several studies have proved that an increase in literacy and a reduction in unemployment and poverty are the major indicators reflecting social development and progress in a society [5, 6, 8, 11, 26]. Hence, the percentage increase in literacy rate and a percentage decrease in unemployment and poverty rates were chosen as the reflective indicators of the study – social progress. Each of these constructs involve multiple variables and hence we used repeated indicate approach to convert these constructs into variables and the Z value of these variables were used in the main model.

2.5 *Rationale for Choosing Critical Factors*

This study focuses on agriculture, industry, and power, along with bank credit and fiscal deficit, as critical determinants of Tamil Nadu's development. These factors have been selected based on their dual significance—they are not only major contributors to state-level GSDP but also have a direct bearing on human development. Agriculture and industry represent traditional and modern pillars of economic activity, while power acts as an enabler for both sectors. Bank credit supports investment and enterprise development, whereas fiscal deficit reflects the state's capacity to fund social programs and infrastructure. Their inclusion offers a multi-dimensional view of development, recognizing that economic growth without social equity is incomplete.

3. *DATA COLLECTION*

The economic and social data for Tamil Nadu, covering a period of 30 years from 1991 to 2021, were sourced from the Reserve Bank of India's (RBI) Handbook of Statistics on Indian Statesi. The dataset includes various indicators that are crucial for understanding the state's economic and social progress over time.

3.1 *Sampling Method and Representativeness*

This study adopts a purposive sampling approach using secondary data sourced from RBI. The selection of Tamil Nadu as the unit of analysis is deliberate and based on its economic significance, being one of India's top-performing states with a diversified economy and a stated goal of becoming a trillion-dollar economy by 2030.

The purposive method ensures relevance and focus by capturing the most appropriate data to assess sectoral contributions to socio-economic progress. To minimize bias, only official government data from credible and consistent sources have been used. This ensures both data validity and representativeness of the time-bound trends across multiple sectors (agriculture, industry, power, banking, and public finance). Since the study is longitudinal and observational in nature, with a focus on state-level macroeconomic and social indicators, the issue of sampling bias is minimized through complete enumeration of annual data points (30 years) rather than relying on subjective sampling choices.

3.2 *Data Preparation*

To ensure consistency in the analysis, the percentage change of each variable from the previous year was calculated and used as the base data, ensuring a uniform unit of measurement for the empirical analysis.

3.3 *Data Analysis*

Partial Least Squares Structural Equation Modelling (PLS-SEM) is used in this work to investigate the complex interrelationships between sectoral variables and their combined impact on Tamil Nadu's economic and social development. PLS-SEM is particularly well-suited for exploratory research involving predictive modelling and theory building, especially when the theoretical structure is still evolving and the available data is limited. The approach supports models with both reflective and formative constructs, as in this study where sectoral GSDP is modelled formatively while social progress and sectoral activity are reflective. Its ability to handle such complexity, along with robustness to small sample sizes as in this 30-year annual dataset makes it preferable over covariance-based SEM [ii](CB-SEM), which demands larger samples and assumes multivariate normality.

The emphasis of PLS-SEM over the forecast rather than firm theory validation lines up with the study's aim of recognizing key drivers of socio-economic development. Its acceptance of non-normal data is particularly treasured when occupied with volatile economic indicators such as fiscal deficits or growth rates. It

accommodates the factor called the recurrent indicator approach that has been used in the study to produce composite variables. However, PLS-SEM does have limitations. It lacks global model fit catalogues and has inadequate capacity for confirmatory testing, potentially expanding relationships if hypotheses are not well validated, an important issue is addressed here by following recognized reliability as well as validity criteria. Thus, it has been compared to regression analysis, which cannot grip latent constructs or indirect effects; PLS-SEM offers superior flexibility in Modeling complex causal relationships, further modifying its usage in this context. However, evaluation was directed through SMART PLS software, a robust tool for PLS-SEM studies. The main focus of the scrutiny was on each variable percentage; along with it, it permitted for a detailed examination of the factors influencing Tamil Nadu's economic as well as social development.

3.4 Ethical Considerations

As this study is based completely on secondary data collected, which are publicly available and authenticated sources such as the Reserve Bank of India (RBI) as well as other government databases, there was no direct participation of human participants. Therefore, concerns such as informed consent, anonymity, or voluntary participation do not spread in this context, and it is also in adherence to research integrity along with academic ethics: (i) All data sources have been properly cited. (ii) Data used has been processed with care to ensure accurate representation and transparency. (iii) No proprietary or confidential datasets have been accessed or included in the analysis. (iv) The data has been used solely for academic purposes, and no individual-level information has been collected, stored, or disclosed.

The study complies with general standards of ethical secondary data usage, ensuring responsible handling of all information utilized.

IV. RESULTS AND ANALYSIS

1. MEASUREMENT MODEL ASSESSMENT

guidelines for reporting PLS-SEM results have been followed in this study to assess the measurement models [27]. The individual indicator variables of the exogenous constructs (agricultural & industrial activity) and endogenous constructs (social progress) are reflective in nature, and that of the mediating construct (sector GSDP) is formative in nature.

2. ASSESSMENT OF THE REFLECTIVE CONSTRUCTS

The reflective concept valuation method measures internal consistency, internal reliability, convergent validity, as well as discriminant validity. Inspecting the indicator loadings, which are displayed in Table 1 below, confirms internal reliability.

Table 1. Indicator loadings.

Reflective Construct	Item	Outer Loading
Social Progress	LR	0.797
	PR	0.937
	UER	0.579
Agricultural Activity	IA	0.848
	PFG	0.773
	PNFG	0.769
	SA	0.871
	YFG	0.743
	YNFG	0.919

Industrial Activity	AT	0.926
	PC	0.686
	CF	**0.23***
	TCE	0.868
	WC	0.822

Source: Secondary Data collected from RBI
Note: * Variable removed due to low indicator loading.

Table 2 shows all the outer loading values (indicator loadings) of the model are greater than the critical value of 0.708 [27], except three variables—unemployment rate (UER—0.579), production capacity (PC—0.686), and capital formation (CF—0.23). We retained the variables UER and PC, and deleted the variable CF from the model as the average variance extracted (AVE) (see Table 2) of the two constructs is more than 0.5. Thus, indicator reliability of the model is not affected.

Table 2. Reliability and validity.

Construct	ϱA	Composite Reliability	Average Variance Extracted
Agricultural Activity	0.93	0.926	0.677
Industrial Activity	0.868	0.898	0.689
Social Progress	0.889	0.823	0.616

Source: Secondary Data collected from RBI

Table 2 proves the internal consistency and convergent validity. Both the composite reliability and ϱA values are between 0.70 and 0.95 and all the AVE values are greater than 0.5 [27].

Table 3. Heterotrait-monotrait (HTMT) ratio.

	Agricultural Activity	Industrial Activity
Industrial Activity	0.158	
Social Progress	0.226	0.22

Source: Secondary Data collected from RBI

By correlating the mean correlation values of the construct items with the geometric mean of average correlation with the objects of the corresponding constructs, the discriminant validity of reflective measurement models is certain. The heterotrait monotrait (HTMT) ratio is the span for this. The discriminant validity of a given view decreases as its HTMT ratio increases. The discriminant validity of the model is guaranteed since all of the HTMT values are below the crucial value of 0.85, as shown in Table 3.

3. ASSESSMENT OF THE FORMATIVE CONSTRUCTS

Assessment of the formative construct encompasses measuring the convergent validity, indicator collinearity, and significance and relevance of the indicators (see Table 4).

By measuring its correlation with the global item through redundancy analysis, the convergent validity of the formative construct is assessed. As the correlation value of the formative construct with the global item, GSDP–TN, is greater than 0.7 (Table 4), we can declare that the formative construct has achieved convergent validity.

Table 4. Assessment of formative construct.

Formative Construct	Item	Outer Weight	Outer Loading	VIF (Outer)	Global Item (β)
Sector GSDP	GAgri	0.352**	0.573	1.407	0.943
	GBakIns	0.092ns	0.279	1.285	
	GCons	0.179**	0.702	2.582	
	GInds	0.534**	0.762	2.223	
	GSrv	0.337**	0.712	1.908	

Source: Secondary Data collected from RBI
Note: "ns"denotes"not significant" ($p > 0.05$); ** = significant ($p < 0.05$).

Variance inflation factor (VIF) is used to quantify the formative construct's indicator collinearity. The VIF values ideally should be closer or less than 3. As all the VIF values of the indicators of the formative construct are lower than 3 (Table 4), the construct doesn't have a collinearity issue. The third and last step in assessing formative construct, the statistical significance and relevance of the construct indicators by assessing the significance of indicator weights. As it can be seen in Table 4, all the indicators of the formative construct except the indicator "GBakIns" are significant. However, we decided not to remove the indicator as it is theoretically important [27].

4. STRUCTURAL MODEL ASSESSMENT

The guidelines of [27], have been considered to assess the structural model. According to [27], "assessment of the structural model involves three important things, namely, (1) checking the collinearity issues through VIA values; (2) checking the relevance and significance of path coefficients trough β; and (3) checking the models' explanatory and predictive power through R2". Our structural model's output is shown in Figure 2 and Table 5.

Table 5 shows that all the VIF values are lower than 2, ensuring that collinearity issue is not there in the model. Regarding the path coefficients, control variables, bank credit (β = 0.388) has a significant impact on industrial activity, and power (β = 0.582) has a significant impact on the endogenous construct (social progress). Both the exogenous constructs–agricultural activity (β = 0.46) and industrial activity (β = 0.531)–have a significant positive impact on sector GSDP and sector GSDP (β = 0.342) has a significant positive impact on social progress (endogenous construct).

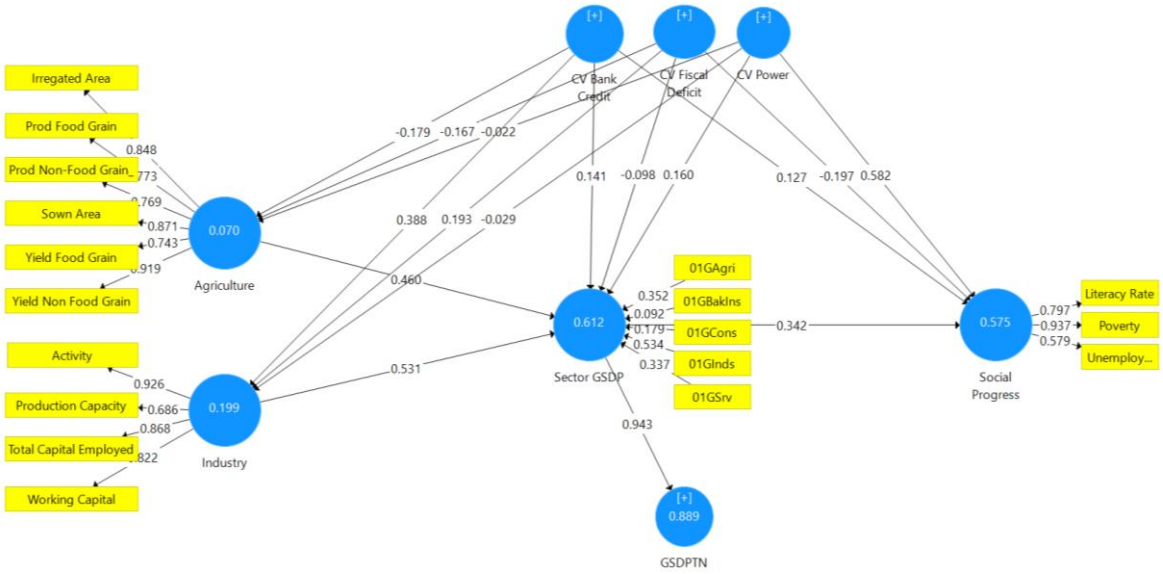

FIGURE 2. Structural model results.

Note: Structural model result exported from SmartPLS Software.

R2 values in Table 5 show that both agricultural and industrial activity of the state are important predictor constructs in explaining sector GSDP (R2 = 0.612), and power and sector GSDP are significant predictors affecting social progress (0.575). As the R2 value of both mediating (sector GSDP) and the endogenous construct (social progress) is greater than 0.50, the study model has achieved "moderate-to-high level of success" [27] in illuminating the factors affecting the economic and social progress of the state. It could be noted that the control variable power (f2= 0.736) has the greatestf2 effect, followed by the predictor constructs industrial activity (f2 = 0.555) and agricultural activity (f2 = 0.483).

The finding of this study is the strong predictive power of power availability on social progress, with the highest effect size (f^2 = 0.736), offering concrete evidence that reliable infrastructure significantly enhances literacy, reduces poverty, and boosts employment. The study also establishes that sectoral GSDP, driven mainly by agriculture (β = 0.46) and industry (β = 0.531), has a substantial impact on social outcomes (β = 0.342), reinforcing the direct link between economic productivity and social welfare. In contrast, the non-significant role of fiscal deficit underscores that macroeconomic stability alone is insufficient without tangible sectoral development.

Table 5. Structural model results.

Outcome	R Sq.	Predictor	Direct Paths & Hypotheses	β	T Statistics	P Values	Sig.?	f^2	VIF
Agricultural Activity	0.07	CV	Bank Credit -> Agriculture	-0.179	0.795	0.427	No	0.033	1.033
		CV	Fiscal Deficit -> Agriculture	-0.167	0.741	0.459	No	0.029	1.046
		CV	Power -> Agriculture	-0.022	0.108	0.914	No	0	1.062
Industrial Activity	0.199	CV	Bank Credit -> Industry	0.388	2.184	0.029	Yes	0.182	1.033
		CV	Fiscal Deficit -> Industry	0.193	0.879	0.379	No	0.044	1.046
		CV	Power -> Industry	-0.029	0.152	0.879	No	0.001	1.062
Sector GSDP	0.612	AGR	Agriculture -> Sector GSDP	0.46	2.214	0.027	Yes	0.483	1.129
		IND	Industry -> Sector GSDP	0.531	2.091	0.037	Yes	0.555	1.312
		CV	Bank Credit -> Sector GSDP	0.141	0.5	0.617	No	0.039	1.304
		CV	Fiscal Deficit -> Sector GSDP	-0.098	0.572	0.567	No	0.022	1.144
		CV	Power -> Sector GSDP	0.16	0.903	0.366	No	0.062	1.062

Social Progress	0.575	GSDP	Sector GSDP -> Social Progress	0.342	2.32	0.02	Yes	0.249	1.108
		CV	Bank Credit -> Social Progress	0.127	0.694	0.488	No	0.034	1.111
		CV	Fiscal Deficit -> Social Progress	-0.197	1.251	0.211	No	0.087	1.052
		CV	Power -> Social Progress	0.582	4.058	0	Yes	0.736	1.082

Source: Secondary Data collected from RBI.
Note: PLS-SEM analysis done using SMART PLS Software

5. PREDICTIVE RELEVANCE OF THE MODEL

In this study, both Sector GSDP and Social Progress exhibited strong predictive relevance, with hypothetical Q^2 values of 0.41 and 0.36 respectively (Table 6). These values exceed the threshold of 0.35, which, according to [27], suggests a high level of predictive accuracy.

Table 6. Predictive relevance of the model.

Construct	Q^2 Predict
Sector GSDP	0.41
Social Progress	0.36

Source: Secondary Data Collected from RBI

6. IMPORTANCE-PERFORMANCE MAP ANALYSIS (IMPA)

The results of Important and Performance Map Analysis (Figure 3) demonstrate for those variables the total effects are important by explaining the variance of the endogenous variables [28].

It can be seen from Figure 6 that GSDP_Agriculture, GSDP_Industry, and the availability of Power has the greatest total effects and these predictors are important in focusing the social progress of the state (performance Power—70; performance GSDP_Agriculture—46.67; and GSDP_Industry—44.05). If 1 unit of the availability of Power increases, the corresponding increase in social progress of the state will be 1.134 units; similarly, 1 unit increase in GSDP_Agriculture and GSDP_Industry will increase social progress by 0.588 units and 1.442 units, respectively. Thus, it can be said that power, GSDP_ Agriculture, and GSDP_Industry plays a very crucial role in the social progress of the state.

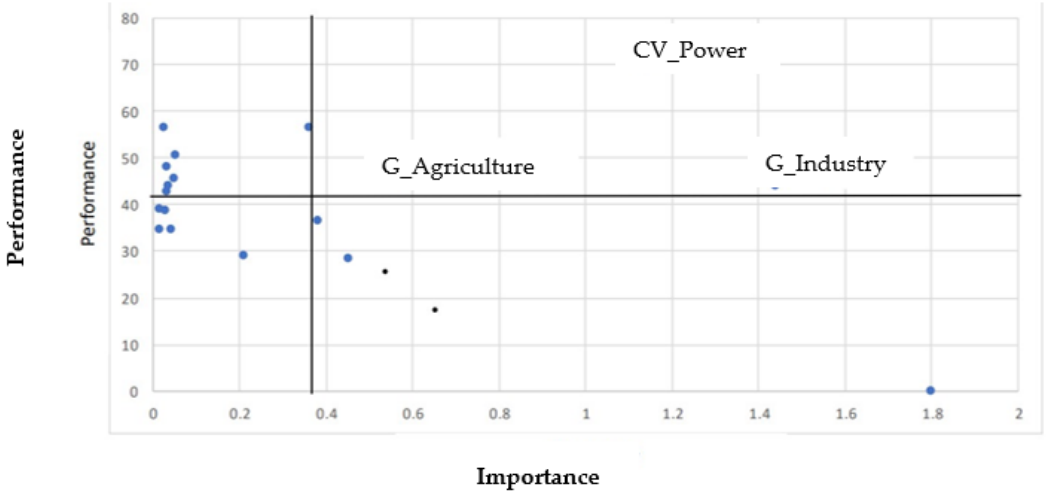

FIGURE 3. Importance-performance map analysis (IPMA).

V. DISCUSSION

The result of this study provides many theoretical insights. Firstly, the significant positive impact of both agricultural and industrial activity on Tamil Nadu's sectoral Gross State Domestic Product (GSDP) that supports existing theories on the foundational role of these sectors in economic development [3]. Notably, the positive relationship between sectoral GSDP and social progress further thoroughly aligns with the wider literature on socio economic development, which importantly signifies that economic output contributes directly in order to enlighten social outcomes [1]. The critical role of power infrastructure in lashing both industrial development and social progress reflects discoveries from past studies on infrastructure's role in permitting economic growth and improving living standards [13].

The identification of agriculture and industry, along with the factor power as key sectors for Tamil Nadu's social and economic development also vibrates with past research that highlights the importance of an expanded economic base. According to [13], socioeconomic factors such as literacy, poverty, and unemployment could only be improved by capitalizing on productive sectors along with the infrastructure that initiates broader economic gains. Hence, the outcomes of the study on the performance of key sectors through Importance-Performance Map Analysis (IMPA) propose that policy interventions that thoroughly focus on improving power infrastructure, agricultural productivity, and industrial development shall yield considerable gains in social progress. This fits well with the notion that inclusive growth in these sectors can help mitigate social disparities, as highlighted by [6, 25].

From a managerial perspective, these findings hold several practical implications for policymakers. The results stress upon the need for targeted investments in power infrastructure, agricultural sector and industrial development. Given that Tamil Nadu's manufacturing sector has faced challenges due to supply chain disruptions and rising input costs, as documented by [4], strengthening the industrial base through policy support, by way of subsidies and improving ease of doing business, will be certainly helpful. In fact, improving access to bank credit can further enhance industrial activity, as shown by the significant impact of bank credit on industrial growth in this study [12].

Furthermore, increasing the availability of power emerges as a critical factor that ensures both economic growth and social progress. This is particularly important for Tamil Nadu as they expand its industrial sector by attracting foreign direct investment (FDI), as noted by [14]. Investments in renewable energy and ensuring stable power supply will not only boost industrial productivity but also have a direct positive impact on social welfare, as supported by the IMPA findings.

In the end, the emphasis of the study on sectoral contributions to GSDP as well as social progress underscores the serious necessity for balance alongside the targeted development policies. As Tamil Nadu develops toward its ambitious goal of flattering a trillion-dollar economy by 2030 [13], the results highlight that absorbed investment and policy support in the agriculture, industry, as well as power sectors will not only boost economic output but also harvest significant social dividends in terms of improved literacy, reduced poverty, and enhanced employment.

Hence, the exceptional involvement of the archetypal deduces in its empirical exploration that sectoral output influences factors such as social welfare, aligning these sectors as foundational pillars for complete enhancement. By quantifying the strength of these relationships, especially the critical role of power infrastructure and the combined impact of agriculture and industry on both GSDP and social outcomes, the study provides evidence-based direction for state-level planning. These insights are highly relevant not only to Tamil Nadu but also to the broader national development agenda, as the state contributes significantly to India's GDP. Strengthening Tamil Nadu's productive sectors can serve as a model for other Indian states, reinforcing the idea that state-level economic resilience and social advancement are integral to achieving sustainable national development. Therefore, aligning sectoral strategies with socio-economic objectives will be key to ensuring that growth is both inclusive and transformative, benefiting the state and, by extension, the country.

VI. CONCLUSION

This study contributes to the growing body of knowledge on state-level economic development by identifying the critical sectoral drivers of Tamil Nadu's socio-economic progress using Partial Least Squares Structural Equation Modelling (PLS-SEM). The integration of agriculture, industry, and power as key explanatory constructs, along with bank credit and fiscal deficit as control variables, offers a nuanced understanding of how sectoral productivity translates into both economic output and social welfare.

At the theoretical level, the study synthesizes classical and modern development theories—such as Endogenous Growth Theory, the Lewis Dual Sector Model, and the Human Development Approach—to construct a holistic framework connecting sectoral activity with social outcomes. This theoretical positioning bridges the gap between economic performance and social indicators, reinforcing the need for inclusive development policies.

At the methodological level, the study applies PLS-SEM to a complex, mixed construct model using long-term time-series data. The use of reflective and formative constructs, together with Importance-Performance Map Analysis (IMPA), enhances the robustness of the model and enables both explanatory and prescriptive insights. This approach is particularly suited for datasets with small to medium sample sizes and high complexity, making it a methodological innovation in state-level economic studies.

At the empirical level, the findings validate that agriculture and industry significantly contribute to Tamil Nadu's GSDP, while power plays a pivotal role in enhancing social progress. The study also highlights the importance of enabling conditions such as credit access and fiscal prudence. These insights provide a data-driven foundation for policy decisions aligned with Tamil Nadu's Vision 2030 of becoming a trillion-dollar economy.

Despite its strengths, the study has certain limitations. At the theoretical level, the model is constrained to established constructs and does not incorporate behavioral or institutional factors that may influence sectoral performance. At the methodological level, the reliance on secondary data and annual observations may limit the model's ability to capture short-term fluctuations or district-level disparities within the state. Additionally, causality cannot be definitively inferred due to the observational nature of the study design.

Future research can expand the theoretical framework by integrating governance, environmental sustainability, or innovation-driven growth as additional constructs influencing development outcomes. From a methodological perspective, the use of panel data at the district level or a multi-group analysis could offer richer insights into intra-state dynamics. Moreover, employing longitudinal structural models or comparing Tamil Nadu with other high-performing Indian states could enhance the generalizability and policy relevance of the findings.

In conclusion, this study provides a comprehensive and policy-relevant roadmap for targeting sectoral investments in agriculture, industry, and power to foster both economic resilience and inclusive social progress in Tamil Nadu. By addressing both methodological rigor and practical relevance, it sets the stage for more granular and dynamic future explorations. At the theoretical close, the study synthesizes classical as well as modern development theories such as endogenous development theory, the Lewis dual sector model, and the human development method in order to construct a holistic framework connecting sectoral activity with social results. Thus, the theoretical positioning bonds the gap between the areas such as economic performance as well as social indicators, which strengthens the need for overall development policies.

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Author Contributions

Prof. Kishore Kunal led the conceptualization and design of the study, aligning it with objectives of the research and contributing to data interpretation and key implications for policymakers and sectoral stakeholders. Dr. K. R. Ramprakash managed data collection and analysis, overseeing the sampling process and PLS-SEM analysis, and ensuring rigor in the methodology and results sections. Dr. Arun Prasad R enriched the literature review with recent research, co-authoring the discussion and conclusion to emphasize practical applications and future research directions. Each author's contributions were essential to the study's comprehensive exploration of the role of productive sectors in driving socio-economic advancement.

Conflict of Interest

Article is not published or presented anywhere.

Data Availability

Data is available with the authors. Can be shared on request.

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Not applicable

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