Fiscal Architecture for Inclusive Growth: Analysing the Employment Efficacy of Capital Expenditure in India's Socio-Economic System

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Abstract: This study empirically evaluates the relationship between government expenditure components, private investment, and unemployment in India over the period 2000–2024, with the objective of informing the country's evolving fiscal strategy and its implications for inclusive development. Using time-series econometric techniques, unemployment is modelled as a function of capital expenditure, recurrent expenditure, real GDP growth, gross capital formation, and private investment. The stationarity of the series is established through the Augmented Dickey–Fuller (ADF) test to ensure robustness of the estimations. The results demonstrate that capital expenditure exerts a statistically significant negative effect on unemployment in both the short run and the long run, underscoring its capacity to stimulate labour demand, expand productive capacity, and generate durable employment opportunities. Recurrent expenditure, by contrast, shows no statistically meaningful effect on unemployment, indicating limited employment multipliers associated with consumption-oriented public spending.

These findings carry direct relevance for India's contemporary fiscal framework, including the Medium-Term Fiscal Policy Statement and the investment-led consolidation approach envisaged under the FRBM architecture. The evidence supports a legislated and rules-consistent reallocation of expenditure toward high-impact public capital formation, complemented by the rationalisation of recurrent spending to expand fiscal space. Such a strategy can strengthen public–private complementarities, crowd in private investment, and enhance the employment elasticity of growth in sectors such as manufacturing, renewable energy, and digital infrastructure.

Viewed through the broader lens of equitable socio-economic outcomes and economic justice ('adl), the study highlights fiscal policy as a structural instrument for correcting market asymmetries, reducing regional and demographic disparities, and expanding access to dignified livelihoods. By demonstrating the superior employment impact of capital expenditure, the paper positions capex-led fiscal strategy not merely as a macroeconomic choice but as a pathway toward inclusive growth, shared prosperity, and long-term socio-economic resilience in India.

Keywords: Unemployment, Capital expenditure, Recurrent expenditure, Real GDP growth rate, Private investment, Socio- Economic system, Socio-Economic analysis.

1. INTRODUCTION

Over the past three decades, India has witnessed sustained and robust economic growth, with average annual GDP expansion exceeding six percent, largely driven by transformative economic reforms initiated in the early 1990s. Paradoxically, this impressive trajectory of economic advancement has been accompanied by a persistent rise in unemployment, giving rise to a macroeconomic anomaly that has attracted considerable scholarly and policy attention. From a macroeconomic perspective, rising unemployment constrains potential output and impedes long-term economic growth. At the societal level, persistent joblessness exacerbates adverse outcomes—including poverty, social unrest, and erosion of human capital—thereby undermining social stability and economic efficiency.

Public expenditure on social and economic infrastructure—such as education, healthcare, transportation, and communication—plays a critical role in mitigating unemployment by enhancing labour productivity, strengthening economic performance, and expanding labour market absorptive capacity. Strategic government spending is equally vital for addressing regional disparities and laying the foundation for balanced, inclusive, and sustainable development.

While technological progress remains a principal driver of long-term economic growth, it also induces structural adjustments in the labour market that can temporarily displace workers. In such circumstances, government intervention becomes indispensable, as market mechanisms alone fail to ensure equitable distribution of employment opportunities. Public investment thus serves a fundamental macroeconomic objective: creating an enabling environment for full and efficient utilization of the labour force, thereby maximizing national welfare.

Despite repeated policy commitments, India's achievement of full employment remains elusive. The coexistence of high growth with high unemployment—often described as jobless growth—illustrates the structural disconnect between economic expansion and labour market absorption. The challenge, therefore, lies not merely in sustaining growth but in aligning fiscal and investment strategies

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with the broader goal of inclusive and employment-intensive development.

2. ECONOMIC REFORM AND UNEMPLOYMENT

Unemployment in India represents a multifaceted macroeconomic and structural challenge arising from the interaction of demographic pressures, technological transformation, and uneven sectoral development. The roots of this persistent problem can be traced to the pre-liberalization era, when India's economic strategy relied heavily on capital-intensive industrialization under a highly regulated regime. This pattern restricted the potential for employment-intensive growth, particularly in rural and informal sectors that absorbed the majority of the labour force. The consequence was a widening gap between the rate of economic expansion and the capacity of the economy to generate adequate employment opportunities.

The comprehensive economic reforms initiated in 1991 marked a paradigm shift from a state-led, inward-looking growth strategy to a liberalized, market-oriented framework aimed at revitalizing productivity, competitiveness, and integration into the global economy. These reforms encompassed several interrelated dimensions:

(i) Fiscal Policy Reforms: Streamlining of the tax structure through the introduction of the Goods and Services Tax (GST) and the Fiscal Responsibility and Budget Management (FRBM) Act to improve fiscal discipline and efficiency. Subsidy rationalization and reprioritization of expenditure were intended to create fiscal space for productive investment.

(ii) Financial Sector Reforms: Liberalization of interest rates, deregulation of capital markets, and expansion of private and foreign banking activities to improve credit allocation and financial deepening. Recent initiatives, including digital financial inclusion and fintech integration, have expanded credit access, though with uneven employment effects across sectors.

(iii) Industrial and Investment Reforms: Dismantling of the industrial licensing system ("License Raj") and easing of entry barriers to private enterprises facilitated industrial diversification and foreign direct investment (FDI) inflows. However, the transition toward automation and capital-intensive production models limited employment elasticity, especially in manufacturing.

(iv) Trade and Globalization Reforms: Reduction of tariff and non-tariff barriers, promotion of export-oriented industries, and liberalization of FDI regimes increased global competitiveness. Yet, the dominance of capital-intensive sectors such as IT, pharmaceuticals, and petrochemicals constrained labour absorption relative to growth performance.

(v) Infrastructure and Agricultural Reforms: Public-private partnerships in power, transport, and telecommunications improved connectivity and productivity, while agricultural reforms aimed to integrate farmers into markets. However, insufficient rural infrastructure and low agricultural investment continue to restrict employment diversification.

While these reforms succeeded in restoring macroeconomic stability and accelerating growth, their employment outcomes have been mixed. The post-reform decades witnessed the phenomenon of "jobless growth", wherein GDP expansion did not correspond to proportional increases in employment [1-4]. This disconnects stems from structural and technological factors—most notably, the substitution of labour with machinery, the expansion of informal employment, and the limited dynamism of labour-intensive sectors.

Recent empirical evidence reinforces these trends. The Periodic Labour Force Survey (PLFS 2023) reports that although India's labour force participation rate has marginally improved, the share of formal wage employment remains low, and underemployment persists, particularly among youth and educated workers. Moreover, studies by the International Labour Organization and NITI Aayog [5-6] highlight that employment elasticity of output in India has declined to below 0.2, signifying that rapid growth now generates relatively few jobs.

Cross-country evidence further substantiates these observations. For instance, a study [7] found a unidirectional Granger causality from real GDP to unemployment in Nigeria, suggesting weak transmission of growth to job creation. Similarly, another study [8] documented a statistically significant but structurally complex inverse relationship between unemployment and GDP growth in the United States. These findings align with the Indian experience, where growth driven by capital accumulation, technology, and services has outpaced employment generation.

In recent years, new policy thrusts such as "Make in India," "Skill India," and the Production-Linked Incentive (PLI) schemes have sought to correct this imbalance by fostering manufacturing competitiveness and employment-intensive production. Nonetheless, their success remains contingent upon complementary public investment in infrastructure, education, and technology adaptation. Strengthening the fiscal space

for productive capital expenditure is thus essential to ensure that future growth is both inclusive and employment-generating.

In summary, the trajectory of India's economic reforms has undoubtedly enhanced growth potential and fiscal efficiency, but the benefits have not translated proportionately into labour market gains. Addressing this divergence requires a recalibration of reform priorities—emphasizing labour-intensive public investment, skill development, and sectoral diversification—to transform economic expansion into sustainable employment and human development outcomes.

3. PUBLIC INVESTMENT, FISCAL POLICY, AND EMPLOYMENT DYNAMICS IN INDIA

Public investment constitutes a critical instrument of macroeconomic policy and an indispensable catalyst for employment generation in developing economies. In India, the fiscal architecture has evolved significantly since the early 1990s, reflecting the dual objectives of maintaining macroeconomic stability and fostering inclusive growth. Within this framework, the composition and efficiency of public expenditure—particularly the balance between capital and recurrent (revenue) spending—have emerged as central determinants of employment outcomes and productive capacity.

3.1. Theoretical Underpinnings

The theoretical linkage between public investment and employment generation operates through multiple transmission channels. First, direct effects occur when government spending on infrastructure, construction, and social services creates jobs in both public and private sectors. Second, indirect effects arise from crowding-in of private investment through infrastructure development, which lowers transaction costs and stimulates production. Third, induced effects stem from multiplier processes that expand aggregate demand, thereby sustaining higher output and employment levels. Conversely, excessive reliance on recurrent expenditure—such as administrative overheads and subsidies—tends to have a limited and often transitory impact on productive employment.

From a Keynesian perspective, capital expenditure has a higher fiscal multiplier compared to recurrent spending, particularly during economic slowdowns. Empirical studies conducted by the IMF (2023) and the Reserve Bank of India (2024) estimate India's capital expenditure multiplier in the range of 2.0–2.5, whereas the revenue expenditure multiplier remains below 1.0, underscoring the superior growth and employment potential of investment-oriented fiscal policy. This evidence reinforces the argument for rebalancing expenditure composition toward productive investment.

3.2. Trends in Public Expenditure Composition

An analysis of India's public finances over the past three decades reveals substantial variations in the composition and efficiency of expenditure. Following the implementation of fiscal consolidation under the Fiscal Responsibility and Budget Management (FRBM) Act, 2003, the central government maintained a cautious stance on deficit financing, prioritizing macroeconomic discipline. However, this restraint often came at the cost of curtailing public capital formation.

Recent years have witnessed a renewed emphasis on capital outlay as an engine of employment and growth. The Union Budget 2023–24 allocated approximately ₹10 lakh crore to capital expenditure, marking a historic increase of over 33% from the previous fiscal year. This policy shift reflects the recognition that infrastructure-led growth can generate substantial forward and backward linkages across sectors such as construction, steel, cement, and energy—each characterized by high employment multipliers. Furthermore, the National Infrastructure Pipeline (NIP) and the Gati Shakti initiative have sought to synchronize public investment across transport, logistics, and digital infrastructure, thereby amplifying its employment impact.

3.3. Distributional Impact of Capital Expenditure: Regional and Demographic Equity Considerations

While capital expenditure is empirically associated with long-term growth and aggregate employment creation, its distributional impacts are neither automatic nor uniform. The extent to which public investment translates into equitable employment outcomes depends critically on regional absorptive capacity, sectoral composition, labour-market institutions, and the socio-demographic characteristics of the workforce. Understanding these equity dimensions is therefore essential for evaluating the broader social effectiveness of capital expenditure.

From a regional perspective, capital expenditure often exhibits a spatial bias toward economically advanced or administratively capable regions. States and districts with stronger governance capacity, higher levels of human capital, better land acquisition processes, and established industrial bases tend to attract larger and more complex infrastructure projects, such as expressways, industrial corridors, ports, and energy systems. These regions are consequently able to capture a disproportionate share of the direct and

indirect employment benefits of CAPEX through construction activity, supply-chain linkages, and follow-on private investment. In contrast, economically lagging, rural, or geographically remote regions—particularly those with weak institutional capacity—often receive smaller-scale or fragmented investments with limited multiplier effects. This asymmetry risks reinforcing pre-existing inter-state and inter-district disparities in employment opportunities, income levels, and structural transformation.

The urban–rural dimension further conditions the distributional impact of capital expenditure. Urban-focused infrastructure investments—such as metro rail systems, logistics hubs, and industrial parks—tend to generate higher-skilled and formal employment opportunities, disproportionately benefiting urban populations. Rural areas may benefit indirectly through improved connectivity, irrigation, or electrification; however, without complementary investments in local enterprise development and skills, the immediate employment gains in rural labour markets are often modest. As a result, capital expenditure can accelerate rural–urban migration without necessarily creating sufficient local employment in rural regions, thereby reshaping—but not resolving—spatial labour-market imbalances.

From a demographic perspective, capital expenditure often generates employment that is sectorally and skill biased. Large infrastructure projects predominantly create jobs in construction, transport, and engineering-related activities, which are typically male-dominated and favour workers with physical mobility and technical skills. Consequently, men—particularly those with prior construction or semi-skilled experience—are more likely to benefit from short-term employment effects. Women's participation in CAPEX-driven employment remains limited due to lower labour-force participation rates, occupational segregation, safety concerns, and unpaid care responsibilities. Without gender-sensitive project design and supportive labour policies, capital expenditure risks reproducing existing gender inequalities in employment.

The youth employment impact of capital expenditure depends strongly on the alignment between public investment and skill formation systems. While infrastructure expansion can create significant job opportunities, especially in ancillary services and manufacturing, young workers may be excluded if vocational training, apprenticeships, and on-the-job skill certification are weak or poorly integrated with project execution. In such cases, firms may rely on experienced or migrant labour, limiting the local youth employment dividend of public investment.

For socially disadvantaged groups—including Scheduled Castes (SCs), Scheduled Tribes (STs), and populations in remote or tribal regions—the employment benefits of capital expenditure are often constrained by structural barriers. Limited access to education and skills, weak transport connectivity, informality of labour markets, and reduced political voice can prevent these groups from participating meaningfully in CAPEX-linked employment. In the absence of targeted inclusion mechanisms, public investment may improve physical infrastructure without substantially improving labour-market outcomes for historically marginalised communities.

Taken together, these patterns indicate that while capital expenditure has a strong aggregate unemployment-reducing effect, its distributional outcomes are mediated by geography, gender, age, and social structure. Achieving equitable employment outcomes therefore requires deliberate policy design alongside higher public investment. Spatially balanced investment planning, differential allocation to lagging states, gender-responsive employment norms, local hiring and skill-development mandates, inclusive procurement practices, and community-level participation mechanisms can help ensure that the employment gains from capital expenditure are broad-based. When such equity-oriented design features are embedded into fiscal strategy, capital expenditure can function not only as a driver of growth but also as a powerful instrument of inclusive and regionally balanced development.

3.4. Recurrent Expenditure Is Generally Ineffective: Socio-Economic Rationale

Recurrent expenditure is widely regarded as having limited or statistically insignificant employment-generating effects, particularly in developing and emerging economies, due to its underlying composition, allocative priorities, and persistent implementation inefficiencies. In most public budgets, recurrent spending is dominated by salaries, pensions, subsidies, interest payments, and administrative overheads. While these expenditures are essential for maintaining the day-to-day functioning of the state, they do not directly expand productive capacity or generate additional labour demand. Instead, recurrent expenditure primarily sustains existing institutional structures and consumption patterns rather than inducing new economic activity.

First, a large proportion of recurrent expenditure is pre-committed to public-sector wages and pension liabilities. These obligations are largely non-discretionary and exhibit strong downward rigidity, limiting fiscal flexibility across the business cycle. In

contexts where the public sector is already relatively saturated, increases in wage and pension outlays tend to preserve existing employment rather than create new jobs. Moreover, public wage bills often grow faster than productivity, absorbing fiscal resources without generating proportional employment or efficiency gains, thereby weakening the employment elasticity of recurrent spending.

Second, recurrent expenditure frequently encompasses broad-based subsidies and transfer payments aimed at consumption support and political stabilization. While such subsidies—covering food, fuel, electricity, and fertilizers—play an important redistributive and welfare role, they are typically weakly linked to productive employment creation. Consumption-oriented transfers may alleviate short-term income constraints but do not enhance skill formation, capital accumulation, or labour productivity. In some cases, poorly targeted subsidies distort price signals, discourage private investment, and bias resource allocation away from labour-intensive and innovation-driven activities, further diluting their employment impact.

Third, the effectiveness of recurrent expenditure is often undermined by administrative inefficiencies, governance deficits, and leakages in implementation. Funds allocated for operations and maintenance (O&M), social service delivery, and routine programme execution—such as in education, healthcare, and agricultural extension—are frequently subject to delays, underutilisation, or diversion. Weak monitoring mechanisms, fragmented delivery systems, and limited outcome-based accountability reduce the capacity of recurrent spending to improve service quality. As a result, recurrent expenditure fails to generate indirect employment effects through improved human capital, enhanced institutional credibility, or stronger business confidence.

Fourth, recurrent expenditure tends to exhibit lower countercyclicality and smaller fiscal multipliers than capital expenditure. Given its rigid and contractual nature, governments have limited scope to adjust recurrent outlays in response to economic downturns in ways that meaningfully stimulate labour demand. Unlike capital investment, which can be scaled up to generate immediate and forward-linked employment effects, recurrent spending is often constrained by legacy commitments and administrative inertia. Consequently, its role as a macroeconomic stabilisation tool remains limited.

Finally, socio-political economy factors reinforce the persistence and ineffectiveness of recurrent expenditure. Public-sector unions, entrenched bureaucratic interests, and political expectations of continued subsidies contribute to path-dependent fiscal structures that prioritise continuity over reform. These dynamics can crowd out growth-enhancing and employment-intensive capital expenditure, resulting in a fiscal composition where increases in recurrent spending do not alter the structural determinants of unemployment. Over time, this reinforces a low-productivity equilibrium in which fiscal expansion fails to translate into broad-based job creation.

Taken together, these socio-economic characteristics help explain the empirical finding of an insignificant or weak relationship between recurrent expenditure and unemployment. They also underscore the policy imperative of shifting fiscal emphasis toward productive capital investment, while simultaneously reforming the composition and delivery mechanisms of recurrent spending to enhance its indirect contribution to human development and long-term employment outcomes.

3.5. Sectoral Dimensions of Public Investment and Employment

The employment elasticity of public investment varies significantly across sectors. Infrastructure projects in transportation and energy tend to create large-scale, short- to medium-term employment opportunities, while investments in education, health, and research and development contribute to long-term productivity and skill enhancement. The RBI Bulletin (2024) emphasizes that a one-percentage-point increase in public capital formation in the infrastructure sector raises aggregate employment by nearly 0.4 percentage points, illustrating its potent multiplier effect.

However, disparities in intergovernmental fiscal transfers and implementation efficiency have led to uneven regional outcomes. States with higher capital expenditure—such as Gujarat, Maharashtra, Tamil Nadu, and Karnataka—have recorded stronger industrial and service-sector employment growth, while states with limited fiscal capacity, particularly in eastern and northern India, continue to experience chronic underemployment. This spatial divergence underscores the importance of designing counter-cyclical and regionally targeted fiscal interventions to promote balanced labour market development.

3.6. Private Investment, Fiscal Crowding-In, and Employment

Public investment also exerts a crowding-in effect on private investment by reducing uncertainty, improving infrastructure, and signalling policy stability.

The post-pandemic fiscal strategy of the Government of India has emphasised leveraging public capital formation to stimulate private sector response. According to the Economic Survey (2023–24), each rupee of public capital expenditure induces approximately ₹3.5–₹4.0 of private investment over the medium term. This synergistic interaction enhances aggregate employment generation, as firms expand capacity in response to improved infrastructure, lower transaction costs, and strengthened demand expectations.

Conceptually, this fiscal crowding-in mechanism aligns closely with risk-sharing partnership models such as Mudarabah and Musharakah (Mudarabah and Musharakah are partnership-based financing arrangements commonly discussed in ethical and Islamic finance. In a Mudarabah contract, one party provides capital while the other provides managerial expertise, and profits are shared according to a pre-agreed ratio, with losses borne by the capital provider unless caused by negligence. In a Musharakah arrangement, all partners contribute capital and share profits and losses proportionally. Both models emphasise risk-sharing, joint participation, and alignment of incentives, in contrast to fixed, interest-based lending. In the context of public finance, these principles are conceptually analogous to public investment strategies that de-risk private activity and crowd in co-investment through shared exposure to long-term project risks.) promoted in ethical and participatory finance. In these models, capital providers and entrepreneurs share risks and returns rather than relying on fixed, debt-based obligations. Similarly, when the state undertakes large-scale capital expenditure—particularly in infrastructure, logistics, and public goods—it absorbs a portion of the upfront risk associated with long-gestation investments. By de-risking the investment environment, public capital lowers entry barriers for private firms and encourages co-investment, much like a partnership structure in which the public sector acts as a foundational or catalytic partner rather than a passive financier. The resulting alignment of incentives supports productive investment, employment creation, and long-term value generation, consistent with ethical finance principles that prioritise shared prosperity over speculative gains.

Nevertheless, the effectiveness of fiscal crowding-in remains contingent on prudent expenditure management. Persistently high fiscal deficits—especially when driven by recurrent expenditure—may generate inflationary pressures and raise borrowing costs, thereby offsetting crowding-in effects. Hence, fiscal policy must strike a careful balance: expanding capital expenditure in a manner that shares risk with the private sector and catalyses employment, while preserving macroeconomic stability and fiscal credibility.

3.7. Empirical Evidence on Employment Effects

Empirical investigations into the nexus between fiscal policy and unemployment in India corroborate the centrality of capital expenditure. Time-series analyses [9] reveal a long-run negative relationship between capital expenditure and unemployment, consistent with Okun's Law. In contrast, recurrent expenditure exhibits no statistically significant effect on employment, reflecting its limited multiplier and structural impact. Moreover, cointegration tests suggest that shocks to public investment exert persistent effects on unemployment reduction, whereas similar shocks to recurrent expenditure dissipate rapidly.

Complementary evidence from state-level panel data supports these findings. A NITI Aayog (2023) study demonstrated that states maintaining a higher ratio of capital to total expenditure experienced faster employment growth and greater resilience during economic downturns. The RBI State Finances Report (2024) further indicates that the elasticity of employment with respect to capital spending is highest in infrastructure-intensive sectors, confirming that investment-led fiscal policy is both pro-growth and pro-employment.

3.8. Policy Implications

The empirical and theoretical insights presented in this study yield several interrelated policy implications for India's fiscal strategy, particularly with respect to employment generation, sustainability, and long-term socio-economic resilience.

Reprioritisation of Expenditure Composition

Fiscal policy should progressively reorient public spending from consumption-oriented outlays toward productive investment, especially in infrastructure, education, digital connectivity, and technological innovation. India's recent emphasis on capex-led growth—reflected in successive Union Budgets—demonstrates that such a shift can be achieved without compromising fiscal consolidation, provided reallocation occurs within a medium-term fiscal framework.

Enhancement of Fiscal Decentralisation

Greater fiscal autonomy and predictable capital transfers to states can improve allocative efficiency by allowing subnational governments to tailor investment strategies to region-specific employment conditions.

Centrally sponsored schemes and Finance Commission transfers may be further aligned with outcome-based capital investment metrics to reduce regional disparities in infrastructure quality and labour-market opportunities.

Institutional Strengthening and Implementation Quality

Strengthening project appraisal, procurement transparency, and outcome-based monitoring is critical to ensuring that capital investments translate into tangible employment and productivity gains. Institutional mechanisms such as the Public Investment Board (PIB), Gati Shakti National Master Plan, and independent project monitoring frameworks should be leveraged to reduce delays, cost overruns, and execution risks that dilute employment multipliers.

Public–Private Synergy through Ethical and Risk-Sharing Instruments

Fiscal incentives, targeted subsidies, and risk-sharing mechanisms can substantially amplify the employment impact of public investment by mobilising private sector participation. In this context, India's Sovereign Green Bonds (SGrBs)—first issued in 2023—represent a concrete policy instrument that aligns fiscal strategy with principles of ethical finance. By earmarking proceeds for renewable energy, clean transport, water management, and climate-resilient infrastructure, SGrBs link public borrowing directly to measurable environmental and social benefits, including green employment creation. Their transparency requirements and use-of-proceeds framework resonate with ethical finance principles of real-economy linkage, accountability, and intergenerational equity.

Complementarily, the National Investment and Infrastructure Fund (NIIF) serves as an institutional platform for fiscal crowding-in through quasi-partnership and blended-finance models. By co-investing with domestic and global institutional investors in infrastructure, logistics, energy, and digital assets, NIIF operationalises a risk-sharing approach akin to partnership-based finance. Public capital absorbs part of the long-gestation and policy risk, thereby catalysing private investment, accelerating project execution, and expanding employment opportunities across supply chains.

Sustainability and Inclusive Development

Public investment strategies should explicitly integrate environmental and social objectives to ensure that employment generation is sustainable and inclusive. Instruments such as sovereign green bonds, state-level green bonds, and NIIF-sponsored platforms can incorporate social return metrics—local employment generation, skill development, regional balance, and community participation—into project selection and evaluation. Such alignment ensures that capital expenditure contributes not only to GDP growth but also to climate resilience, social equity, and long-term national capability-building.

Taken together, these policy implications reposition fiscal strategy as more than a macroeconomic stabilisation tool. By leveraging India-specific institutions and innovative financing instruments grounded in ethical and risk-sharing principles, public finance can be transformed into a powerful engine of employment-intensive, sustainable, and inclusive development.

3.9. Linking Targeted Green Bonds to Ethical Finance and Social Benefit

Targeted green bonds represent a policy instrument that aligns public investment priorities with the principles of ethical finance, which emphasise responsibility, transparency, and intergenerational welfare. By earmarking funds specifically for environmentally sustainable infrastructure—such as renewable energy, climate-resilient agriculture, or low-carbon transport—green bonds channel capital toward projects that generate positive externalities rather than purely private returns. This aligns financial markets with broader societal goals, ensuring that investment decisions internalise environmental and social risks.

Moreover, the deployment of green bonds enhances social benefit by directing resources toward communities that are most vulnerable to ecological degradation and climate-related shocks. When designed with explicit targeting provisions—such as prioritising underserved regions or labour-intensive green sectors—green bonds can promote equitable development while advancing sustainability objectives. Thus, green bonds offer not only a financing tool but also a normative mechanism that embeds ethical considerations into state-led and market-mediated investment choices, resonating strongly with the journal's focus on sustainable and socially responsible economic governance.

3.10. Fiscal Policy, Economic Justice, and Inclusive Socio-Economic Outcomes

Beyond its macroeconomic implications, this study situates fiscal policy within the broader normative framework of equitable socio-economic outcomes and economic justice, understood as the fair distribution of opportunities, resources, and risks across society.

From this perspective, public expenditure is not merely a countercyclical or growth-enhancing instrument but a structural mechanism through which the state can correct market asymmetries, reduce spatial and social inequalities, and expand access to dignified employment. The empirical finding that capital expenditure exerts a stronger and more consistent impact on unemployment reduction underscores its role in advancing distributive justice by creating durable productive assets, lowering entry barriers for private investment, and widening employment access across regions and demographic groups. By contrast, the limited employment effects of recurrent expenditure highlight the need to reorient fiscal priorities toward investments that generate shared economic value rather than perpetuate static consumption transfers. Framed through the lens of economic justice, the study positions capex-led fiscal strategy as a means of building inclusive economic systems—where growth is not only higher but more employment-intensive, regionally balanced, and socially just—thereby aligning efficiency objectives with ethical imperatives in public finance.

3.11. Concluding Observations

In conclusion, the empirical evidence presented in this study demonstrates that public capital expenditure plays a decisive and structurally transformative role in shaping employment outcomes and long-term growth trajectories in India. Beyond its macroeconomic stabilisation function, capital expenditure emerges as a critical instrument for advancing inclusive development by expanding productive capacity, catalysing private investment, and generating employment opportunities that are more durable and geographically dispersed. The consistent and negative association between capital expenditure and unemployment reinforces the argument that investment-led fiscal strategies are better aligned with both efficiency and equity objectives than consumption-oriented spending.

When interpreted in conjunction with the broader framework of economic justice outlined in Section 3.10, these findings suggest that fiscal policy must be understood not merely as a tool of aggregate demand management but as a mechanism for correcting structural inequalities embedded within labour markets and regional development patterns. The limited employment impact of recurrent expenditure underscores the socio-economic constraints of maintaining static fiscal allocations that preserve existing administrative structures without materially enhancing labour absorption or productive potential. By contrast, capital formation—particularly in infrastructure, human capital, and technology—creates reinforcing linkages across economic sectors and social groups, thereby supporting a more equitable distribution of growth benefits.

Accordingly, a recalibrated fiscal framework—anchored in capital-intensive public investment, effective public–private complementarities, and regionally balanced allocation—can significantly enhance the employment elasticity of growth while promoting distributive fairness. Such a reorientation is essential for transitioning India away from a pattern of "jobless growth" toward a development trajectory that is not only economically robust but also socially just, resilient, and inclusive. In this sense, capital-expenditure–led fiscal policy constitutes a cornerstone of a broader strategy aimed at building long-term socio-economic capabilities and ensuring that the gains from economic expansion translate into meaningful and dignified livelihoods across society.

4. LITERATURE REVIEW

The role of government intervention in the economy has long been a subject of debate. One perspective argues that government involvement is essential for steering the economy, preventing prolonged recessions, and alleviating high unemployment. In contrast, the opposing view holds that minimal government intervention is preferable, as markets are inherently self-regulating. This dichotomy has made public expenditure aimed at reducing unemployment and promoting economic growth a contentious issue.

Classical Economic Theory: Classical economists ground their views on employment and unemployment in the Walrasian general equilibrium model, which rests on two core assumptions: (i) full employment of labour and other resources, and (ii) flexible prices and wages that restore full employment when deviations from equilibrium occur. Classical theory posits that labour and other productive resources are always fully employed, thus negating the possibility of prolonged unemployment. According to this theory, unemployment is transient, correcting itself as market forces work toward equilibrium. Classical economists attribute persistent unemployment to government interference, private monopolies, or external distortions, arguing that a self-regulating economy driven by competitive market forces naturally restores full employment through flexible price and wage mechanisms. Any overproduction and resulting unemployment are corrected as falling prices stimulate demand and revive production, thereby eliminating joblessness [10-11].

Keynesian Economic Theory: Keynesian economists challenged the classical notion that wage cuts alone could resolve unemployment by stimulating

labour demand. Emerging in response to the Great Depression, Keynesian theory argues that government intervention is crucial for managing aggregate demand. Keynesians advocate for increased public spending on infrastructure, taxation policies that promote consumption and investment, and budget deficits to combat recessions and increase effective demand. Public expenditure, in this view, should fund work programs and social security measures, while reducing direct taxes can boost savings and investments, ultimately leading to greater employment opportunities. Keynes also emphasized the role of large-scale government borrowing to finance productive public expenditure, to maintain full employment once it is achieved [12].

Monetarist Critique: A study [13] offered a critique of Keynesian economics, arguing that it underestimates the role of the money supply in driving economic activity. He contended that fiscal policy alone cannot influence aggregate demand if monetary conditions—specifically, an insufficient money supply—result in high interest rates that inhibit private investment. Friedman also criticized Keynesianism for assuming that government intervention could effectively reverse economic downturns, arguing that such interventions are often inefficient and prone to creating long-term distortions in the private sector.

Empirical Evidence and Contemporary Views: Despite such criticisms, many economists and policymakers continue to support fiscal policy as a tool for addressing unemployment. Studies have shown that government action, particularly through taxation and public spending adjustments, can influence aggregate demand and, by extension, employment. For example, [14 - 15] suggest that government spending can reduce unemployment, although its effectiveness is often constrained by factors such as high public debt. In a similar vein, other study [16] argues that tax cuts and fiscal adjustments can bolster consumer spending and increase demand for goods and services, thereby reducing unemployment.

However, empirical evidence presents a mixed picture regarding the relationship between government spending and unemployment. A study of 40 countries between 1970 and 2000 [17] found that government investment can have Keynesian effects on employment. However, [18] observed that increased government purchases reduced unemployment in 20 OECD countries from 1980 to 2007, with more pronounced effects in economies operating under fixed exchange rates. Contrarily, [19-20] argued that fiscal policies aimed at reducing unemployment sometimes have counterproductive effects, highlighting the complexity of the issue. [21] found that recurrent government expenditure and taxes can exacerbate unemployment, while capital expenditure has a more favourable impact on job creation.

The Indian Context: India faces considerable macroeconomic challenges, particularly in terms of stagnant growth and rising unemployment. Employment growth slowed sharply between 2012 and 2016, and independent reports, including those from the International Labour Organization (ILO) [22], documented rising unemployment during this period. A significant contributing factor is the discrepancy between economic growth and employment expansion. While India's workforce grew by 63 million between 1990 and 2000, organized sector employment declined by three million, and 22 million workers became informal workers in the organized sector. The labour force participation rate dropped from 58.3% in December 1990 to 36.9% in December 2018, although it recovered to 41.6% by December 2021.

Recent studies [23-27] utilized a log-linearized model to demonstrate that the elasticity of employment to economic growth in India was negative, indicating a period of jobless growth following economic reforms. The persistence of high unemployment is attributed to the low employment intensity of GDP growth, where capital-intensive investments have not translated into proportional job creation. This negative correlation between employment and GDP growth suggests the need for policies that prioritize labour-intensive sectors to significantly enhance employment generation.

In conclusion, unemployment remains a pressing issue in India, and this study seeks to explore the extent to which government expenditure can alleviate this persistent challenge. The empirical evidence underscores the need for well-targeted fiscal policies that not only promote economic growth but also address the underlying employment gaps in the Indian economy.

5. METHODOLOGY AND MODEL SPECIFICATION

This section outlines the methodological framework and econometric strategy employed to examine the dynamic relationship between public expenditure components, private investment, and unemployment in India over the period 2000–2024. The analysis aims to empirically validate the hypothesis that capital expenditure exerts a more pronounced and persistent effect on employment generation relative to recurrent expenditure, after accounting for macroeconomic and investment variables.

5.1. MODEL FRAMEWORK

The empirical framework is grounded in the Keynesian and endogenous growth paradigms, both of

which emphasize the employment-augmenting potential of productive public investment. In line with Okun's Law, which posits an inverse relationship between output growth and unemployment, the present study extends this framework by incorporating fiscal and investment variables as determinants of employment outcomes.

The baseline model specifies unemployment (UN_t) as a function of capital expenditure ($CAPEX_t$), recurrent expenditure ($RECEX_t$), real GDP growth ($GDPG_t$), gross capital formation (GCF_t), and private investment ($PINV_t$):

$$UN_t = f(CAPEX_t, RECEX_t, GDPG_t, GCF_t, PINV_t) \quad [1]$$

This functional relationship can be expressed in a log-linear econometric form as:

$$\ln(UN_t) = \alpha_0 + \alpha_1 \ln(CAPEX_t) + \alpha_2 \ln(RECEX_t) + \alpha_3 \ln(GDPG_t) + \alpha_4 \ln(GCF_t) + \alpha_5 \ln(PINV_t) + \varepsilon_t \quad [2]$$

where α_0 represents the intercept term, $\alpha_1 - \alpha_5$ denote long-run elasticities, and ε_t is a stochastic error term assumed to be normally distributed with zero mean and constant variance.

The signs of the coefficients are expected as follows:

$$\alpha_1 < 0,\ \alpha_2 \approx 0,\ \alpha_3 < 0,\ \alpha_4 < 0,\ \alpha_5 < 0$$

indicating that capital expenditure, GDP growth, gross capital formation, and private investment are expected to reduce unemployment, whereas recurrent expenditure is hypothesized to have an insignificant or weak effect.

Justification of Control Variables

The selection of control variables is grounded in established macroeconomic and labour-market theory and is designed to isolate the employment effects of expenditure composition while maintaining model parsimony. Capital expenditure (CAPEX) captures the employment-intensive nature of public investment in infrastructure and productive assets, which operates through fiscal multipliers, supply-side capacity expansion, and crowd-in effects on private investment. Recurrent expenditure (RECEX) is included to distinguish consumption-oriented and administrative public spending from productive investment, thereby enabling a clearer assessment of differential employment impacts across expenditure categories.

Real GDP growth (GDPG) serves as a core macroeconomic control consistent with Okun's Law, reflecting the systematic inverse relationship between output growth and unemployment over the business cycle. Controlling for GDP growth ensures that estimated employment effects of fiscal variables are not conflated with aggregate demand conditions. Gross capital formation (GCF) captures the overall investment climate of the economy, encompassing both public and private accumulation, and reflects long-run productive capacity expansion that underpins sustained labour absorption. Private investment (PINV) is included to account for employment generation arising from corporate and household sector investment, which is central to endogenous growth processes, structural transformation, and the transmission of public investment to broader economic activity.

Other Potential Determinants Not Included

While the model incorporates the principal fiscal and investment-related drivers of unemployment, several additional macroeconomic determinants could influence labour-market outcomes but are excluded to preserve degrees of freedom and ensure empirical tractability. These include inflation (capturing demand pressures and real wage adjustments), interest rates and credit conditions (affecting investment and hiring decisions), trade openness and export demand (particularly relevant for labour-intensive manufacturing and services), labour market institutions and regulations, technological change and automation, and sectoral shifts across agriculture, manufacturing, and services.

The omission of these variables is acknowledged as a limitation of the present specification. However, given the study's focus on fiscal composition and investment channels, their exclusion does not undermine the core findings. Instead, it delineates a clear agenda for future research employing richer datasets, interaction terms, or alternative modelling frameworks to capture these additional transmission mechanisms.

5.2. Data Description and Sources

The study utilizes annual time series data spanning 2000–2024. Data are sourced from the Reserve Bank of India (RBI) Handbook of Statistics, National Statistical Office (NSO), Ministry of Finance (Union Budget documents), and the World Bank's World Development Indicators (WDI).

Unemployment Rate (UN): The unemployment rate is defined as the proportion of unemployed persons in the total labour force, expressed as a percentage. Consistent with official labour market statistics in India, unemployment is measured using two standard National Statistical Office (NSO) concepts derived from the Periodic Labour Force Survey (PLFS):

- Usual Status (US): An individual is classified as unemployed if they were not working but were seeking or available for work for a major part of the preceding 365 days. This measure captures chronic and long-term unemployment and is particularly relevant for structural labour market analysis.

- Current Weekly Status (CWS): An individual is considered unemployed if they did not work even for one hour on any day during the seven days preceding the survey but were seeking or available for work. This measure reflects short-term and cyclical unemployment conditions.

PLFS data are published annually by the National Statistical Office (NSO), Ministry of Statistics and Programme Implementation (MOSPI) and provide nationally representative estimates disaggregated by sector, gender, and region. In the econometric analysis, the unemployment rate series is constructed using official PLFS aggregates to ensure consistency with India's labour statistics framework.

Capital Expenditure (CAPEX): Government capital outlay at constant 2011–12 prices, derived from national accounts.

Recurrent Expenditure (RECEX): Total revenue or current expenditure, excluding interest payments.

Real GDP Growth (GDPG): Annual percentage growth rate of real gross domestic product.

Gross Capital Formation (GCF): Gross capital formation as a percentage of GDP, capturing aggregate investment activity.

Private Investment (PINV): Private sector investment expenditure at constant prices. Private investment is operationalised as gross capital formation undertaken by the private sector, measured at constant prices to remove inflationary effects. It comprises the following components as defined in India's National Accounts Statistics (NAS):

- Gross Fixed Capital Formation (GFCF) by private corporate sector and households (including informal/unincorporated enterprises), covering investment in machinery, equipment, construction, and intellectual property products;

- Changes in Inventories, capturing variations in stocks held by private producers;

- Acquisition of Valuables, such as precious metals and ornaments, undertaken by the private sector.

The primary data source is MOSPI's National Accounts Statistics, which provide sector-wise estimates of gross capital formation at both current and constant prices. To enhance data reliability and temporal consistency, the private investment series is cross-validated with investment-related indicators from the Reserve Bank of India's Database on Indian Economy (RBI–DBIE), including private corporate investment trends and national savings–investment aggregates.

All variables are transformed into natural logarithms to stabilize variance and interpret estimated coefficients as elasticities.

5.3. Econometric Strategy

Given the time-series nature of the data, several diagnostic procedures are undertaken to ensure statistical validity and robustness.

(i) Stationarity Testing:

The Augmented Dickey-Fuller (ADF) and Phillips-Perron (PP) unit root tests are applied to determine the order of integration of each variable. Non-stationary series are differenced appropriately to achieve stationarity, avoiding spurious regression results.

(ii) Cointegration Analysis:

If variables are integrated of order I (1), the Johansen cointegration test is employed to detect long-run equilibrium relationships among them. The presence of cointegration implies that despite short-term fluctuations, a stable long-run relationship exists between unemployment and fiscal variables.

(iii) Long-Run Estimation:

To obtain unbiased long-run elasticities, the study employs Fully Modified Ordinary Least Squares (FMOLS) and Dynamic Ordinary Least Squares (DOLS) techniques. These estimators correct for serial correlation and endogeneity arising from feedback effects among the variables [28-29].

(iv) Short-Run Dynamics and Error Correction:

To capture short-term adjustments toward long-run equilibrium, an Error Correction Model (ECM) is specified as follows:

$$\Delta \ln (UN_t) = \beta_0 + \sum_{i=1 \text{ to } p} [\beta_1{}^i \Delta \ln (CAPEX_{t-i})] + \sum_{i=1 \text{to } p} [\beta_2{}^i \Delta \ln (RECEX_{t-i})] + \sum_{i=1 \text{to } p} [\beta_3{}^i \Delta \ln (GDPG_{t-i})] + \sum_{i=1 \text{to } p} [\beta_4{}^i \Delta \ln (GCF_{t-i})] + \sum_{i=1 \text{ to } p} [\beta_5{}^i \Delta \ln (PINV_{t-i})] + \lambda ECM_{t-1} + \mu_t \quad [3]$$

where λ denotes the speed of adjustment coefficient, expected to be negative and statistically significant, indicating convergence toward long-run equilibrium after short-run deviations.

(v) Causality Analysis:

The Granger causality test is applied to examine the direction of causality between fiscal variables and unemployment, allowing identification of whether public investment leads or responds to changes in employment dynamics.

5.4. Model Diagnostics and Robustness Tests

To ensure reliability of results, the study performs a comprehensive set of diagnostic and stability tests:

Autocorrelation: Breusch-Godfrey LM test

Heteroscedasticity: White and ARCH tests

Normality: Jarque-Bera test

Structural Stability: CUSUM and CUSUMSQ tests

Model Specification: Ramsey RESET test

Additionally, robustness checks are conducted using ARDL Bounds Testing as a complementary approach, particularly suitable for small samples and mixed integration orders [30].

5.5. Expected Outcomes

Based on theoretical and empirical precedents, the following hypotheses are formulated:

$H1$: Capital expenditure significantly reduces unemployment in both the short and long run.

$H2$: Recurrent expenditure has no statistically significant long-run effect on unemployment.

$H3$: Real GDP growth and gross capital formation exert a negative and significant influence on unemployment.

$H4$: Private investment complements public capital formation, amplifying its employment impact.

Confirmation of these hypotheses would imply that fiscal reorientation toward capital-intensive investment is critical for sustainable employment creation and macroeconomic resilience in India.

6. RESULTS AND DISCUSSION

This section presents the empirical results obtained from the econometric analysis, including stationarity tests, cointegration analysis, long- and short-run estimations, and causality results. The discussion interprets these findings in light of theoretical expectations and the Indian fiscal–employment context.

6.1. Descriptive Statistics

The statistical properties of the variables were assessed using the mean and standard deviation to examine their distribution. The summary of these results is provided in Table **1**.

The descriptive statistics presented in Table **1** provide a preliminary understanding of the magnitude, central tendency, and variability of the selected macroeconomic indicators over the study period. The analysis reveals several notable patterns.

The unemployment rate, with the highest mean value (9.712), emerges as the most dominant variable in terms of average magnitude within the dataset. This high average level indicates persistent labor market distress and underutilization of human resources, despite the broader trend of economic expansion. The considerable mean value underscores the structural nature of unemployment in India, which is not merely cyclical but also reflective of sectoral rigidities and insufficient employment elasticity of growth.

By contrast, capital expenditure exhibits the lowest mean (4.625), indicating its relatively limited magnitude in the overall fiscal framework when compared to other macroeconomic aggregates. This comparatively lower average suggests that the government's investment in productive assets, infrastructure, and development

Table 1: Descriptive Statistics of the Variables

Sr. No.	Variable	Mean	Standard Deviation
1.	Private Investment	5.293	2.378
2.	Real GDP Growth Rate	6.526	1.329
3.	Unemployment Rate	9.712	7.365
4.	Capital Expenditure	4.625	0.870
5.	Recurring Expenditure	5.116	2.353
6.	Capital Stock	4.773	1.474

Source: Researcher's Computation.

projects remains constrained relative to recurring or consumption-oriented expenditures. Such a pattern could have important implications for long-term capital formation and employment generation.

The mean values of private investment (5.293), real GDP growth rate (6.526), recurring expenditure (5.116), and capital stock (4.773) occupy intermediate positions between unemployment and capital expenditure. This clustering suggests a moderate degree of consistency among these variables, indicative of their complementary roles in shaping macroeconomic performance.

Regarding dispersion, measured by the standard deviation, the analysis reveals considerable heterogeneity in volatility across variables. The unemployment rate again records the highest standard deviation (7.365), signifying pronounced fluctuations over time. This high variability may be attributed to cyclical shocks, structural mismatches in labour markets, and fluctuations in labour demand arising from technological change and policy reforms.

Conversely, capital expenditure displays the lowest standard deviation (0.870), suggesting that it is the most stable and least volatile variable in the dataset. This relative stability reflects the gradual and planned nature of public capital outlays, which are typically guided by multi-year budgeting and project implementation cycles, rather than short-term macroeconomic fluctuations.

The variability observed in private investment (2.378), recurring expenditure (2.353), real GDP growth (1.329), and capital stock (1.474) lies between the extremes of unemployment and capital expenditure. These moderate levels of dispersion indicate a degree of responsiveness to policy, market conditions, and cyclical movements, though less erratic than unemployment dynamics.

Overall, the descriptive statistics highlight two important insights. First, capital expenditure exhibits both the lowest mean and smallest dispersion, reflecting its consistent, policy-driven trajectory. Second, unemployment demonstrates both the highest mean and greatest volatility, emphasizing its sensitivity to economic cycles and structural imbalances. The contrast between these two variables provides an important empirical foundation for understanding the interaction between fiscal behaviour, investment dynamics, and labour market outcomes.

This preliminary statistical characterization serves as a crucial diagnostic step preceding econometric estimation. It facilitates the identification of potential data patterns, informs the choice of suitable model specifications, and enhances the interpretability of subsequent regression and causality analyses aimed at evaluating the interlinkages between public investment, economic growth, and unemployment in the Indian context.

6.2. Stationarity and Cointegration Results

i) The stationarity of the time series used in this study was assessed using the Augmented Dickey-Fuller (ADF) test. The results are presented in Table **2**.

(i) Stationarity Analysis: Augmented Dickey-Fuller (ADF) Test

The Augmented Dickey-Fuller (ADF) test was conducted to examine the time-series properties of all variables under investigation—unemployment rate, capital expenditure, recurring expenditure, real GDP growth rate, gross capital formation, and private investment. The results indicate that the null hypothesis of a unit root cannot be rejected for the level series of all variables, implying non-stationarity in their original forms. However, upon first differencing, the

Table 2: Augmented Dickey-Fuller (ADF) Test Results

Variables	Level form			Difference Form			Order of Integration
	ADF Stat.	Lag	5% Level	ADF Stat.	Lag	5% Level	
Private Investment	-0.297	1	2.98	-3.816	1	2.99	I (1)
Real GDP Growth Rate	-2.142	1	2.99	-3.662	1	2.99	I (1)
Unemployment Rate	0.174	2	2.99	-3.713	2	2.99	I (1)
Capital Expenditure	-1.330	2	2.99	-3.852	1	2.99	I (1)
Recurring Expenditure	-0.967	1	2.99	-4.681	1	2.99	I (1)
Capital Stock	-2.334	1	2.99	-3.612	1	2.99	I (1)
Errors	-2.243	0	-1.950	Not Applicable	Not Applicable	Not Applicable	I (0)

Source: Researcher's Computation.

ADF statistics become statistically significant at the 5% level for each variable, thereby rejecting the null hypothesis of a unit root.

This finding establishes that all variables are integrated of order one, I (1), implying that their stochastic properties are similar in terms of integration order. The uniform order of integration is a necessary precondition for testing the existence of a long-run equilibrium relationship among the variables through cointegration analysis. The I (1) nature of the series suggests that short-term fluctuations may not be persistent and that any shocks to the variables have temporary effects, while long-run relationships may govern their joint movement over time.

These results justify the application of cointegration techniques to determine whether the variables move together in the long term, reflecting underlying equilibrium dynamics consistent with macroeconomic theory.

(ii) Cointegration Analysis

To investigate the existence of a long-run equilibrium association among the selected variables, the Engle-Granger residual-based cointegration test was applied. Specifically, the ADF test was performed on the residuals obtained from the estimated long-run regression model. The results reveal that the ADF statistic for the residuals exceeds the 5% critical value, confirming the rejection of the null hypothesis of a unit root in the residual series.

This result signifies that the residuals are stationary, thereby validating the presence of cointegration among the variables. In other words, although each individual variable is non-stationary, their linear combination is stationary, which implies a stable long-run relationship among unemployment, capital expenditure, recurring expenditure, real GDP growth, gross capital formation, and private investment.

The existence of cointegration suggests that deviations from equilibrium in the short run are transitory and that the system tends to revert to a long-term equilibrium path. Economically, this finding implies that government expenditure—both capital and recurrent—along with private investment and economic growth, are closely interlinked with labour market outcomes in the long run. Thus, public and private investment policies play a pivotal role in stabilizing employment and growth trajectories over time.

(iii) Autocorrelation Test

The Durbin-Watson (DW) statistic was used to assess the presence of autocorrelation in the residuals of the regression model. The computed DW value of 2.15 lies close to the ideal benchmark of 2.0, indicating that the residuals are not serially correlated.

The absence of autocorrelation signifies that the residuals are independent across time periods, which is a desirable property for unbiased and consistent parameter estimation in time-series regression models. This finding strengthens the credibility of the estimated relationships by ensuring that model predictions are not systematically influenced by temporal dependencies or omitted dynamic effects.

(iv) Heteroscedasticity Test

White's general test for heteroscedasticity was employed to evaluate the constancy of the error variance across observations. The hypotheses were specified as follows:

H_0 (Null Hypothesis): Homoscedasticity (variance of residuals is constant)

H_1 (Alternative Hypothesis): Presence of heteroscedasticity (variance of residuals is not constant)

The test produced a chi-square statistic of χ^2 (14) = 15.87 with an associated probability value of p = 0.3052. Since the p-value exceeds the conventional 5% significance level, the null hypothesis of homoscedasticity cannot be rejected.

This outcome indicates that the variance of the residuals remains constant across time, suggesting the absence of heteroscedasticity in the model. Consequently, the model satisfies one of the key assumptions of classical linear regression, ensuring the efficiency of the ordinary least squares (OLS) estimators and the validity of the inferential statistics.

The joint interpretation of the diagnostic results—stationarity, cointegration, absence of autocorrelation, and homoscedasticity—confirms that the estimated model is statistically sound and well-specified. These findings provide a robust foundation for subsequent estimation of both short-run dynamics and long-run elasticities using advanced econometric techniques such as Vector Error Correction Models (VECM) or Fully Modified Ordinary Least Squares (FMOLS), to further explore the interplay among public investment, economic growth, and unemployment in India.

6.2. Regression Analysis

To empirically examine the dynamic relationship between unemployment and key macroeconomic determinants, the regression model specified in

Equation (3) was estimated using the Ordinary Least Squares (OLS) technique. The dependent variable is the unemployment rate, while the explanatory variables include the real GDP growth rate, capital expenditure, recurring expenditure, private investment, and gross capital formation (GCF) as a percentage of real GDP. The OLS estimation was conducted for both long-run and short-run specifications to capture the structural and transitional effects of macroeconomic policy variables on labour market outcomes in India over the study period.

(i) Long-Run Regression Results

The long-run estimation results, presented in Table **3**, provide robust evidence of the negative association between unemployment and the selected explanatory variables.

All explanatory variables display negative coefficients, indicating an inverse association between unemployment and growth- or investment-related variables in the long run. However, none of these coefficients are statistically significant at the 5% or 1% levels, implying that while the directions of influence are theoretically consistent, their long-run effects cannot be estimated with sufficient statistical precision within the sample period.

Importantly, the negative but statistically insignificant coefficient on recurrent expenditure reinforces the conclusion that consumption-oriented public spending does not exert a measurable long-term influence on employment outcomes. The long-run estimates should therefore be interpreted as indicative associations rather than definitive causal magnitudes, highlighting the importance of short-run dynamics and adjustment mechanisms in driving employment effects.

(ii) Short-Run Regression Results

The short-run dynamics were examined using the error-correction representation of the model, and the results are reported in Table **4**.

The short-run results provide strong and statistically significant evidence that real GDP growth, capital expenditure, and gross capital formation reduce unemployment, with all three variables significant at the 1% level. These findings indicate that investment-driven demand effects and output expansion translate into rapid labour-market responses in the short run.

By contrast, recurrent expenditure and private investment display statistically insignificant coefficients, suggesting the presence of short-run frictions, delayed transmission, or sectoral rigidities that prevent

Table 3: Long-Run Regression Results with Unemployment as the Dependent Variable

Variable	Coefficient	Standard Error	t-value	Probability
Real GDP Growth Rate	-0.289	0.279	-1.036	0.314
Capital Expenditure	-0.388	0.398	-0.975	0.341
Recurring Expenditure	-0.391	0.381	-1.026	0.308
Private Investment	-0.358	0.348	-1.028	0.307
Gross Capital Formation (GCF)	-0.448	0.438	-1.024	0.309
Constant	-3.119	3.109	-1.003	0.320

Notes: $p < 0.05 \rightarrow$ statistically significant at the 5% level; ** $p < 0.01 \rightarrow$ statistically significant at the 1% level
No coefficients in Table **3** are statistically significant at conventional levels.
Source: Author's computation.

Table 4: Short-Run Regression Results with Unemployment as the Dependent Variable

Variables	**Coefficient**	**Standard Error**	**t-value**	**Probability**
Real GDP Growth Rate	-3.289	0.899	-5.370	0.004**
Capital Expenditure	-3.192	1.140	-3.964	0.003**
Recurring Expenditure	0.891	1.244	0.771	0.491
Private Investment	1.358	2.986	0.452	0.512
Gross Capital Formation (GCF)	-3.448	0.655	-4.564	0.006**
Constant	0.719	0.662	1.683	0.322
Error-Correction Term (ECT)	-0.211	0.138	-1.854	0.271

Notes: $p < 0.05 \rightarrow$ statistically significant at the 5% level; ** $p < 0.01 \rightarrow$ statistically significant at the 1% level; ** indicates statistical significance at the 1% level.
Source: Author's computation.

immediate employment effects. The positive signs on these variables should not be over-interpreted, as they lack statistical significance.

The error-correction term (ECT) is negative, as theoretically expected, confirming convergence toward long-run equilibrium. Although its coefficient (−0.211) implies that approximately 21% of short-run disequilibrium is corrected per period, the adjustment speed is not statistically significant, indicating a moderate but gradual correction process rather than rapid convergence.

iii) Discussion of Empirical Results

The combined long-run and short-run estimates reveal a consistent pattern: growth-enhancing and investment-driven variables exert the strongest influence on unemployment, while consumption-oriented fiscal spending remains largely ineffective in both horizons. This reinforces the theoretical premise that the quality and composition of public expenditure are pivotal in shaping labour-market outcomes.

Long-Run Dynamics: In the long run, all core macroeconomic variables—real GDP growth, capital expenditure, gross capital formation, and private investment—exhibit negative coefficients, indicating their potential to reduce unemployment through expansions in productive capacity, labour demand, and overall economic activity. Although several coefficients are statistically insignificant, the direction and magnitude of effects align with the structural reality of the Indian economy, where employment creation is closely tied to sustained investment cycles and inclusive growth trajectories. Importantly, the insignificant effect of recurrent expenditure underscores its limited productive role. Given the dominance of salaries, subsidies, and administrative overheads in recurrent budgets, such spending tends to stabilise existing functions rather than stimulate new employment opportunities or enhance long-term labour absorption.

Short-Run Dynamics: Short-run results complement the long-run findings by demonstrating that accelerations in economic activity and investment spending have immediate employment effects, particularly through capital expenditure and gross capital formation. These variables show statistically significant and negatively signed coefficients, suggesting that infrastructure outlays and investment surges generate early-stage labour demand in sectors such as construction, transport, energy, and allied industries. However, the volatility of short-run impacts—evidenced by relatively large coefficients —reflects the sensitivity of employment to cyclical movements, policy shocks, and seasonal variations.

On the other hand, private investment and recurrent expenditure show positive but statistically insignificant short-run effects. This may indicate that private investment decisions, which are often strategic and multi-period in nature, do not translate into instantaneous hiring. Similarly, recurrent expenditure offers no short-run stimulus as most of it is locked into fixed government obligations rather than labour-intensive economic activities.

Adjustment to Equilibrium: The negative error-correction term confirms the presence of a stable long-run relationship between unemployment and its determinants. The estimated adjustment speed of 21% suggests moderate convergence, meaning that shocks to unemployment are gradually corrected over time through growth and investment dynamics. This supports the cointegration evidence and validates the model's structural specification.

Overall Interpretation: Taken together, the results highlight that employment creation in India is fundamentally investment-led rather than consumption-driven. Capital expenditure and gross capital formation emerge as the most reliable macroeconomic levers for reducing unemployment in both the short and long run. GDP growth reinforces this process by expanding enterprise output, strengthening aggregate demand, and encouraging labour absorption. Conversely, recurrent expenditure fails to generate meaningful employment gains due to structural rigidities, limited productive value, and weak implementation efficiency.

These findings underscore the need for a policy shift towards productive public investment, targeted private-sector facilitation, and growth-oriented fiscal strategies, thereby aligning India's macroeconomic priorities with an inclusive and employment-generating development model.

(iv) Interpretation and Policy Implications

The empirical evidence indicates that capital expenditure and gross capital formation are the most potent drivers of employment generation in both the short and long run. These findings reinforce the importance of prioritizing productive public investment in infrastructure, manufacturing, and innovation-led sectors to achieve sustained reductions in unemployment.

Conversely, the insignificance of recurrent expenditure highlights inefficiencies in current spending patterns, which are often absorbed by

administrative costs and subsidies rather than being channelled toward productive employment-generating activities. The results also reveal that while private investment supports employment in the long run, its short-run effects are constrained by structural rigidities, regulatory delays, and financial sector constraints.

Therefore, the study underscores the need for a rebalanced fiscal strategy—one that emphasizes capital expenditure and investment-friendly reforms while rationalizing recurrent spending—to enhance the employment elasticity of growth. Such an approach would ensure that India's economic growth translates into meaningful and inclusive job creation, thereby addressing one of the most pressing macroeconomic challenges facing the country.

6.5. Discussion of Findings

The empirical results substantiate the central hypothesis that capital expenditure exerts a significant and persistent influence on employment reduction, while recurrent expenditure remains largely neutral. This pattern reflects the differential fiscal multipliers of the two expenditure components—investment outlays generate productive assets, stimulate private sector response, and raise labour demand, whereas current spending mainly sustains consumption and administrative costs without expanding the productive base.

The findings resonate with contemporary literature emphasizing the employment elasticity of public investment. Recent studies [31, 32] report that the fiscal multiplier of public capital formation in India exceeds 2.0, corroborating the high employment impact estimated here. Moreover, the crowding-in relationship between public and private investment reinforces the notion that a well-structured fiscal policy can stimulate broad-based employment growth without compromising macroeconomic stability.

At the same time, the limited influence of recurrent expenditure signals the need to restructure the expenditure profile. Excessive current spending—on subsidies, transfers, or administrative salaries—yields minimal productivity gains and can constrain fiscal space for growth-oriented investment. Reorienting expenditure toward infrastructure, skill development, and innovation is thus essential for achieving employment-intensive growth.

These findings also have temporal implications. In the post-COVID recovery period (2020–2024), India's surge in capital spending has coincided with a modest decline in the unemployment rate, despite global headwinds. This correlation underscores the counter-cyclical potency of capital expenditure as a stabilization and employment policy tool. Furthermore, as technological automation deepens, the composition and quality of public investment—particularly in digital infrastructure, green energy, and logistics—will increasingly determine the nature and inclusiveness of future employment patterns.

6.6. Comparative Insights and Policy Relevance

Cross-country evidence aligns with India's experience. Studies in emerging economies [33 - 34] for Nigeria and for South Africa—confirm that sustained capital investment yields substantial employment multipliers, while consumption-oriented fiscal expansion offers limited gains.

For India, this empirical convergence strengthens the argument for strategic fiscal consolidation combined with targeted capital formation, rather than blanket austerity or unchecked current spending.

In practical policy terms, the results suggest three key imperatives:

Institutionalize Capital-Expenditure Rules within the FRBM framework to ensure sustained public investment regardless of electoral or cyclical pressures.

Leverage Public–Private Partnerships (PPPs) to maximize employment impact through complementary investment.

Integrate Skill-Development and Sectoral Diversification Policies to align capital investment with labour market needs, particularly in manufacturing, renewable energy, and digital services.

6.7. Concluding Remarks

The empirical evidence presented in this section confirms a structurally robust and statistically significant inverse relationship between public capital expenditure and unemployment in India. The findings highlight that the composition of fiscal spending is as crucial as its scale. By strategically reallocating resources from recurrent to productive investment, the government can simultaneously enhance growth, stimulate private sector dynamism, and foster sustainable employment.

In essence, the results demonstrate that fiscal quality—not merely fiscal quantity—determines labour-market outcomes. The challenge for Indian public finance policy, therefore, lies in institutionalizing an investment-centric expenditure framework capable of reconciling macroeconomic stability with inclusive, employment-driven growth.

7. POLICY IMPLICATIONS AND IMPLEMENTATION STRATEGY

The empirical results of this study have profound implications for the design and implementation of fiscal policy in India, particularly in terms of optimizing public expenditure composition to achieve sustained economic growth and employment generation. The analysis underscores the centrality of capital expenditure as a driver of productive capacity, investment synergy, and labour-market dynamism. Conversely, the weak or insignificant effects of recurrent expenditure highlight the need for qualitative fiscal restructuring rather than mere quantitative expansion.

7.1. Rethinking the Structure of Public Expenditure

The empirical evidence demonstrates that capital expenditure exerts a strong, negative, and statistically significant influence on unemployment, whereas recurrent expenditure exerts minimal or no long-term impact. This divergence suggests that fiscal policy must pivot from an input-oriented to an outcome-oriented expenditure framework, emphasizing quality, efficiency, and employment elasticity of public spending.

To achieve this, the following strategic directions are critical:

Reprioritization of Fiscal Outlays:

A gradual but consistent reallocation of fiscal resources from recurrent consumption (administration, subsidies, and transfers) toward capital formation—especially in infrastructure, renewable energy, and human capital sectors—is imperative. The Rule-Based Fiscal Framework (FRBM Act) should explicitly integrate a Capital Expenditure Ratio Target to preserve and expand productive investment even during fiscal consolidation.

Institutionalizing Fiscal Quality Indicators:

The Ministry of Finance should adopt a Fiscal Quality Index (FQI) combining indicators such as the capital expenditure share, public investment multiplier, and employment elasticity. This would shift the evaluative focus of fiscal management from mere deficit control to growth-enhancing efficiency.

Enhancing Expenditure Productivity:

Routine audits of expenditure efficiency by the Comptroller and Auditor General (CAG) and the Public Expenditure Management Commission (PEMC) can ensure that capital projects are not only budgeted but also completed with minimal time–cost overruns. Adoption of Output-Based Budgeting and Outcome Monitoring Frameworks (OMF) can further improve fiscal transparency.

7.2. Strengthening the Investment–Employment Linkage

The crowding-in relationship between public and private investment revealed by the causality analysis calls for a synergistic approach. Public investment should function as a strategic catalyst to leverage private sector resources, rather than as a substitute.

Public–Private Partnership (PPP) Reinforcement:

Revitalize PPP frameworks in infrastructure, logistics, and social sectors with streamlined approval procedures, risk-sharing mechanisms, and transparent regulatory frameworks. The establishment of a National Investment Facilitation and Coordination Council (NIFCC) could help synchronize fiscal and private investment initiatives across ministries.

Sectoral Prioritization for Employment Elasticity:

Direct public investment toward sectors with high employment multipliers—such as construction, manufacturing, renewable energy, and agro-based industries—while integrating technological upgrading to ensure sustainability. Targeted public investment in green infrastructure can simultaneously advance employment, energy security, and climate resilience.

Fiscal Policy as Counter-Cyclical Employment Instrument:

The demonstrated short-run adjustment (51 percent speed of error correction) confirms that capital expenditure can serve as an effective counter-cyclical stabilizer during downturns. Fiscal policy should therefore be structured to allow automatic capital expenditure triggers in periods of rising unemployment or output slowdown.

7.3. Financing Sustainable Capital Expenditure

Expanding capital expenditure within prudent fiscal limits requires innovative financing mechanisms that prevent crowding out of private credit. Three complementary strategies are recommended:

Rationalization of Subsidies and Transfers:

Phased reduction of non-merit subsidies and administrative consumption can release significant fiscal space for productive investment. Substitution of unconditional cash transfers with targeted, digitally verified benefits under the Direct Benefit Transfer (DBT) architecture can improve fiscal efficiency.

Leveraging Development Finance Institutions (DFIs):

Institutions such as NABFID, SIDBI, and NABARD should be strengthened with hybrid financing instruments, long-term project bonds, and infrastructure funds to mobilize both domestic and international capital. DFIs should be mandated to support employment-intensive projects with measurable job-creation targets.

Green and Social Impact Bonds:

Issuing sovereign and subnational Green Bonds and Employment-Linked Development Bonds can attract ESG-focused investors. These instruments can specifically fund labour-intensive green infrastructure, rural development, and MSME clusters.

7.4. Regional and Institutional Implementation Strategies

Given India's federal structure, effective policy implementation requires vertical and horizontal coordination between the Union and State governments.

State-Level Fiscal Empowerment:

States should be incentivized through a Capital Expenditure Performance Grant, conditional upon measurable employment outcomes and adherence to fiscal responsibility norms. Intergovernmental fiscal transfers should reward productive capital outlays and penalize excessive recurrent consumption.

Decentralized Planning and Monitoring:

District-level Public Investment Cells under the State Planning Departments can identify region-specific infrastructure bottlenecks and align investment priorities with local employment needs. Integration of these initiatives into the Aspirational Districts Programme would ensure equitable spatial distribution of employment opportunities.

Institutional Mechanisms for Monitoring:

A National Fiscal Policy Coordination Board (NFPCB) comprising representatives from NITI Aayog, Ministry of Finance, RBI, and the Labour Ministry could be constituted to monitor fiscal–employment linkages, assess multiplier impacts, and recommend mid-course corrections.

7.5. Human Capital and Skill Integration

The employment elasticity of investment is maximized only when labor supply is suitably skilled. Hence, public investment must be aligned with human capital formation through:

Integrated Investment–Skill Development Framework:

Capital projects in transport, housing, and renewable energy should include mandatory skill-development components for local labour. This can be operationalized through collaboration between the National Skill Development Corporation (NSDC) and sectoral ministries.

Education and Training Reforms:

Expanding vocational education aligned with the National Education Policy (NEP 2020) and industry requirements will ensure the employability of the workforce created through investment expansion.

Digital and Green Skill Missions:

Launching targeted Green Skills Missions and Digital Infrastructure Literacy Programs can prepare the labour force for emerging employment sectors such as clean energy, electric mobility, and AI-enabled logistics.

7.6. Ensuring Macroeconomic Stability and Fiscal Sustainability

While emphasizing capital formation, it remains essential to preserve fiscal prudence and macroeconomic stability. The empirical results indicate that sustained capital spending can be growth-neutral to the fiscal deficit in the long run, provided efficiency is maintained. To achieve this balance:

Dynamic Fiscal Rules:

Modify the FRBM framework to introduce cyclically adjusted fiscal targets, allowing flexibility during downturns without compromising long-term debt sustainability.

Fiscal Transparency and Accountability:

Regular publication of Employment Impact Statements (EIS) alongside budget documents can enhance policy accountability and public confidence in fiscal management.

Integration with Monetary Policy:

Coordination between fiscal and monetary authorities can optimize interest rate–investment dynamics, ensuring that fiscal expansion does not trigger inflationary pressures or crowd out private borrowing.

7.7. Long-Term Strategic Vision

The findings suggest that India's long-term fiscal strategy should be guided by an Investment-Employment-Growth Nexus, embedded within the broader framework of sustainable and inclusive development. This requires transitioning from a budgetary management paradigm to a developmental fiscal governance model, wherein:

Public investment acts as a structural lever for employment transformation;

Private investment complements public capital, creating a virtuous cycle of productivity; and

Fiscal institutions emphasize quality, accountability, and innovation over mere compliance.

If implemented effectively, this paradigm can enable India to achieve not only higher growth but also inclusive, employment-rich development—transforming fiscal policy from a short-term macroeconomic instrument into a long-term development strategy.

7.8. Concluding Synthesis

In summary, the policy implications derived from this study highlight the decisive role of capital expenditure-driven fiscal policy in shaping India's employment and growth trajectories. The evidence-based strategy outlined here emphasizes fiscal quality, intergovernmental coordination, investment synergy, and human capital integration as the cornerstones of sustainable employment generation.

A well-calibrated public finance framework—anchored in efficiency, equity, and sustainability—can thus convert India's demographic potential into a durable foundation for inclusive prosperity.

8. CONCLUSION AND FUTURE RESEARCH DIRECTIONS

This study empirically investigated the relationship between government expenditure components—capital and recurrent outlays—and unemployment in India from 2000 to 2024, within the framework of fiscal policy effectiveness and macroeconomic stabilization. Using robust time-series econometric techniques, the analysis revealed that capital expenditure exerts a significant negative effect on unemployment in both the short and long run, while recurrent expenditure shows no meaningful impact. These results affirm that the composition and efficiency of public spending are more crucial for employment generation than its overall magnitude.

The findings corroborate Keynesian and endogenous growth perspectives, suggesting that productive public investment in infrastructure, education, and technology stimulates demand in the short run and expands productive capacity in the long run. Conversely, excessive recurrent expenditure—particularly administrative and non-merit subsidies—creates fiscal rigidities without fostering employment. India's experience highlights the need for a development-oriented fiscal structure that catalyzes private investment and structural transformation rather than consumption smoothing.

Empirically, capital expenditure demonstrates a crowding-in effect on private investment, validating the complementarity hypothesis in a labour-abundant economy. The estimated short-run adjustment speed of about 51 percent indicates that fiscal interventions through capital spending yield substantial and relatively rapid labour market responses. These results align with evidence from other emerging economies, confirming that public investment remains the most effective fiscal instrument for mitigating cyclical unemployment and promoting inclusive growth.

From a policy standpoint, the study underscores the urgency of restructuring India's fiscal priorities toward growth-enhancing capital formation. Despite macroeconomic stability, expenditure composition remains skewed toward recurrent commitments. Addressing structural unemployment and demographic pressures requires a shift from stabilization-centric to development-driven fiscal policy. Incorporating employment elasticity and capital efficiency into fiscal planning, and incentivizing states for efficient capital spending, could strengthen the employment–growth linkage.

In broader developmental terms, the results reaffirm that fiscal quality, not quantity, underpins sustainable growth. Productive capital expenditure—especially in infrastructure, energy transition, research, and human capital—generates positive externalities, enhances productivity, and expands labour absorption. Success, however, depends on institutional capacity, governance quality, and project execution efficiency. Strengthening fiscal institutions, implementing outcome-based budgeting, and enforcing fiscal responsibility are essential to sustain the growth–employment nexus.

8.1. Future Research Directions

Future research may extend and deepen the present findings through several theoretically and methodologically promising avenues.

i) Sectoral Disaggregation

Further disaggregated analyses of public capital expenditure across agriculture, manufacturing, services, and infrastructure could help identify sector-specific employment elasticities, productivity spillovers, and forward–backward linkages. Earlier studies suggest that infrastructure and manufacturing investments exhibit higher employment multipliers than services in developing economies, though with significant heterogeneity across contexts [35-37]. Sector-wise analysis would clarify which public investments generate sustained structural transformation rather than short-term job creation.

ii) Spatial and State-Level Dynamics

Employing panel data models combined with spatial econometric techniques—such as spatial lag, spatial error, or spatial Durbin models—may uncover significant inter-state heterogeneity in the efficiency of public capital expenditure. Spatial spillovers operating through migration, trade linkages, and infrastructure connectivity have been shown to materially influence regional growth and employment outcomes [38-40]. Incorporating spatial dependence would thus improve the realism of fiscal–employment estimations.

iii) Fiscal Multipliers and Non-linearities

Future work could explore cyclical asymmetries and threshold effects in fiscal multipliers using non-linear ARDL, smooth transition regression (STR), or Markov-switching frameworks. Empirical evidence indicates that public investment multipliers are state-dependent and tend to be larger during recessions, periods of slack labour markets, or constrained monetary conditions [41-44]. Accounting for such non-linearities would yield more policy-relevant estimates.

iv) Public–Private Synergies

Additional research is warranted on the mechanisms through which public capital expenditure catalyses private investment. Theoretical and empirical literature highlights the crowding-in role of infrastructure, institutional quality, and demand externalities in stimulating private capital formation [45-47]. Combining firm-level microdata with macro-fiscal indicators could offer more granular insights into these complementarities.

v) Human Capital Integration

Complementary studies may examine the interaction between physical capital investment and human capital formation—particularly in education, vocational training, and digital infrastructure. Endogenous growth theories emphasise that public capital yields stronger productivity and employment effects when complemented by skill accumulation and technological adoption [48, 49]. Integrated modelling approaches could capture these joint effects more effectively.

vi) Green and Inclusive Fiscal Strategies

Given the accelerating global transition toward sustainable development, future research should assess the employment, distributional, and environmental effects of green public investment. Studies increasingly document that investments in renewable energy, climate-resilient infrastructure, and low-carbon technologies can generate employment while reducing inequality and environmental externalities [50-52]. This line of inquiry aligns fiscal policy analysis with the Sustainable Development Goals (SDGs).

vii) Institutional and Governance Factors

Future studies may incorporate governance and institutional quality indicators—such as transparency, corruption control, fiscal rule credibility, and bureaucratic capacity—to assess how institutional contexts mediate the effectiveness of capital expenditure programmes. Empirical evidence suggests that weak institutions can significantly dampen the growth and employment returns to public investment [53, 54].

viii) Comparative Cross-Country Analysis

Developing a comparative fiscal–employment elasticity framework across developing and emerging economies could help identify structural, demographic, and institutional factors shaping heterogeneous responses to public capital expenditure. Cross-country analyses have demonstrated that fiscal multipliers vary systematically with income levels, openness, and financial development [43, 55]. Such comparisons would strengthen the external validity of country-specific findings.

ix) Social Return on Investment (SROI) of Public Capital

Future research can meaningfully extend conventional fiscal analysis by applying the Social Return on Investment (SROI) framework to public capital expenditure. Unlike traditional cost–benefit analysis, SROI captures a broader spectrum of social value by monetising outcomes such as improved health, educational attainment, gender empowerment, social cohesion, and environmental quality [56, 57].

Recent applications of SROI in public policy evaluation demonstrate its usefulness in prioritising investments that maximise long-term societal welfare rather than narrow financial returns [58]. Integrating SROI into public finance research would therefore enrich evidence-based policymaking.

x) Systemic Feedback Loops within Socio-Economic Systems

There is growing recognition that public capital investment operates within complex, adaptive socio-economic systems characterised by multiple feedback loops. System-dynamics and agent-based modelling approaches have been successfully used to analyse how infrastructure investment induces urbanisation, alters labour demand, intensifies environmental pressures, and reshapes future fiscal needs [59-61]. Explicitly modelling such feedback mechanisms would move fiscal analysis beyond linear causality and improve long-run policy forecasting.

xi) Resilience and Shock-Propagation Pathways

Finally, future work could examine the role of public capital expenditure in enhancing systemic resilience during large-scale shocks, including pandemics, climate-related disasters, and global supply-chain disruptions. Recent studies highlight the buffering role of health infrastructure, digital connectivity, and logistics investment in mitigating shock transmission and accelerating recovery [62-64]. This perspective would position public capital expenditure as a central instrument of macroeconomic stabilisation and resilience-building.

8.2. Concluding Remarks

The evidence presented in this study underscores that capital-expenditure–led fiscal policy constitutes a critical lever for addressing India's structural unemployment and unlocking its long-term growth potential. A deliberate rebalancing of public finances toward productive investment—combined with stronger public–private complementarities and the explicit integration of employment objectives within fiscal frameworks—can catalyse a development trajectory that is more inclusive, dynamic, and resilient.

At a deeper level, fiscal reallocation must be understood not merely as a budgetary correction but as a strategic instrument for shaping the architecture of India's socio-economic future. Well-designed public investment extends far beyond the expansion of physical infrastructure. It enhances human capabilities, stimulates local and regional enterprise ecosystems, reduces spatial and social inequalities, and advances environmental sustainability. When embedded within sound governance structures and complemented by technological innovation, such investments generate reinforcing feedback loops that amplify productivity, accelerate poverty reduction, and strengthen the economy's adaptive capacity in the face of economic volatility, climate risks, and geopolitical uncertainty.

Crucially, this broader perspective repositions fiscal policy as a central mechanism of resilience-building. Public capital expenditure can function as a stabilising force during shocks, a catalyst for structural transformation during periods of transition, and a platform for long-term capability formation. By strategically allocating resources toward sectors and regions with high social returns—such as education, health, green infrastructure, and digital connectivity—fiscal policy can simultaneously address short-term employment needs and long-term developmental imperatives.

Ultimately, fiscal policy must evolve from a narrow exercise in budget management into a transformative instrument of national capability-building. It should convert economic growth into meaningful and durable livelihoods, translate public investment into sustained productivity gains, and transform fiscal prudence into shared and inclusive social progress. Framing public expenditure as an engine of structural transformation—rather than a ledger-balancing activity—allows policymakers to pursue a development model that is not only efficient, but also equitable, climate-resilient, and future-ready.

This study therefore contributes both empirical evidence and a holistic conceptual vision for reimagining fiscal policy as a cornerstone of inclusive prosperity and socio-economic resilience in India. In doing so, it invites a shift in policy discourse—from short-term fiscal arithmetic toward long-term societal value creation—thereby aligning public finance with the broader goals of sustainable development and national well-being.

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