


Chapter 8

Impact of Technological Change and Economic Factors on the Employment Level in South Africa

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ABSTRACT

This study investigates the impact of technological change and economic factors on employment levels in South Africa from 1980 to 2023. The research explores how innovation, economic growth, investment, and education influence labor market dynamics, providing insights into effective policy measures for employment generation. The analysis utilizes annual data and applies advanced econometric techniques, including Vector Autoregression, Granger causality, Johansen cointegration, and Vector Error-Correction Models. Diagnostic tests ensure model robustness, while Impulse Response Functions and variance decomposition highlight dynamic relationships. The results indicate that technological innovation, has a positive but short-impact on employment growth. Education expenditure shows delayed but significant long-term effects, underscoring its importance in enhancing workforce skills. GDP growth consistently boosts employment, while investment demonstrates limited direct effects. Cointegration and IRFs reveal that economic and innovation shocks have varying temporal impacts on employment.

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INTRODUCTION

Employment plays a vital role in promoting economic stability and social well-being, acting as a key driver of sustainable development. In South Africa, however, the labor market faces critical challenges, including persistently high unemployment rates, stark income inequality, and structural economic constraints. These issues are compounded by the global transition toward technological innovation, which presents both opportunities for economic growth and risks of job displacement. Addressing these challenges requires a comprehensive understanding of the factors influencing employment levels and the role of technological change in shaping labor market dynamics.

South Africa, as the second-largest economy in Africa, occupies a critical position in the continent's economic and social landscape. With a history marked by socio-political transitions and economic transformations, the country has made significant progress in some areas, such as infrastructure development and technological adoption. However, challenges such as high youth unemployment, a reliance on resource-intensive industries, and disparities in access to quality education and skills training continue to hinder its labor market performance. At the same time, South Africa's commitment to innovation and education creates a unique opportunity to address these structural issues while driving sustainable employment growth.

This chapter investigates the impact of technological advancements and key economic factors on employment in South Africa over the period 1980–2023. Using gross domestic expenditure on R&D as a proxy for technological change, the study examines how innovation drives job creation while potentially transforming traditional industries. It also considers the effects of GDP growth, total investment, and government expenditure on education, which collectively reflect the broader economic environment and policy priorities. Together, these variables provide a multidimensional perspective on the drivers of employment growth in South Africa.

Incorporating insights from labor sociology, this study contextualizes employment trends within the broader framework of inequality and precarity. The uneven distribution of economic opportunities, exacerbated by technological disruptions, raises concerns about job security and wage disparities. Technological advancements, while fostering productivity, may also contribute to labor market polarization, disproportionately benefiting high-skilled workers while displacing low-skilled labor. These concerns align with debates in labor sociology regarding the impact of automation and digitalization on workforce stratification.

From a labor law and policy perspective, this study also considers the role of regulatory frameworks in managing the intersection of technology and employment. South Africa's labor policies, including minimum wage laws, collective bargaining structures, and technology governance regulations, shape the extent to which in-

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