ENTRY #823

How should South Africa redesign education, industrial policy, and fiscal incentives to harness artificial intelligence for productivity growth while limiting labour-markets distruptions?

1. Introduction

There is a clear structural contradiction in South Africa's economy where high levels of unemployment (>30%) persist, yet firms face difficulties recruiting workers for skilled positions related to software development, networking and cybersecurity (Gumbi:2026:11). In general, overall productivity growth has been found to remain weak. It was estimated by the International Monetary Fund that increasing and broadening AI adoption could lift global growth by up to 0.3 percentage points for 2026 and between 0.1 and 0.8 percentage points annually thereafter, depending upon the rate of AI adoption and readiness (IMF, 2026:7).

First, education should move away from paying for enrolments and paying for outcomes by releasing a portion of the funding at the end of the process, once the graduate has secured and retained employment. Use payroll records as a mechanism to check whether employment and retention actually occurred and not use them as a source of the funding. Industrial policies need to focus on those sectors with tradable goods where demand is likely to be price-elastic and where increases in productivity drive out output and employment. Fiscal incentives provided for support structures need to link into each other to provide rewards for increased investment, training and improved outcomes. Claims of fiscal neutrality require validation via some checks

2. Analytical Framework

2.1 Concepts to keep separate

Firstly, exposure is not displacement as an occupation can be highly exposed to AI and employment in it can still grow. Second, automation is not augmentation as AI can perform a task or it can change how that worker performs a task. Third, research and development is not diffusion because creating new knowledge differs from adopting existing technology. Fourth, productivity is not employment since growth alone does not tell you who gains as it may raise output, wages, profits or without necessarily increasing employment (Acemoglu and Restrepo:2019: 3-30)

2.2 Engine A: The Acemoglu-Restrepo Task framework

The model suggests that AI adoption causes labour to be displaced while also boosting productivity to increase output. Labor can be reinstated by employing people on these new tasks. However, employment increases only when the effects of increased productivity and reinstate are more significant than the effect of displacement (Acemoglu and Restrepo:2019:3-30)

When applied to the South African economy, the reinstatement effect does not guarantee jobs for displaced workers and new tasks may attract a long queue of people who are already unemployed. The main question is not whether new tasks appear but whether productivity gains convert into labour demand. This reveals the condition that employment rises only if the output expansion caused by lower prices outweighs the reduction in labour required per unit of output.

2.3 Engine B: O-Ring Complementary

The second engine uses a simplified weakest-link representation of O-ring complementarities drawing on Jones (2011).

$$TFP_t = A_t \cdot min\{S_t,\ M_t,\ D_t,\ E_t,\ K_t\}$$

S,M,D,E and K represent skills, management, data, energy and capital, as expressed in normal indexes.

Total Factor Productivity is constrained by the weakest part of the production process much like the O-ring theory describes. A single weak link theory can compromise the entire system (Kremer,1993, p. 551). In South Africa, the broader landscape for AI investment is fundamentally shaped by hurdles, namely data availability, power grid, stability and technical skills deficits (Schindler et al:2026)

Table 1: Complementary Constraints in South Africa

Complementary Constraint	Evidence	Policy implication
Skills	The World Bank reports a digital skills gap amidst high	Education redesign should focus on alignment and outcomes and not enrolment alone

	unemployment (World Ban:,2026:3).	
Management	A severe deficit in advanced digital skills actively limits corporate technology adoption (World Bank,2026:3)	Industrial policy should provide adoption diagnostics and not just capital.
Data/Connectivity	The 2026 Budget directly funds strategic data and broadband infrastructure expansion(National treasury:2026:144)	the state should invest in data infrastructure to address the D term directly.
Energy	Load shedding damages the industry. Reliable energy is vital for AI,as subsidies cannot fix energy gaps(Ndubuisi & Avenyo: 2026)	Energy reliability is a binding constraint that AI subsidies cannot substitute for.
Capital	South Africa leads regional AI preparedness but trails global frontiers (Schindler:2026:7)	Capital subsidies may have low returns where other constraints bind.

Source: Author's synthesis

3. South African Diagnosis

3.1 Labour Markets Structure

The labour market compounds the productivity problem since the unemployment rate exceeds 30% (Gumbi: 2026). Of the online vacancies considered by the World Bank, those published between October 2020 and June 2024 were most commonly requesting transversal digital skills (44.8%) (World Bank:2026:3). A focus on advancing specialised technological skill sets ignores digital capability requirements which arise across current occupation categories.

3.2 Displacement Evidence

Research shows AI adoption can reduce employment in the short run as evidenced by significant declines after AI shocks explaining 30% of forecast error variance in manufacturing employment over a ten-quarter horizon (Giwa and Ho, 2026:6-8). The finding demonstrates why productivity gains cannot be assumed to translate to automatic employment growth in South Africa's manufacturing sector. It measures exposure and short-run shocks, not long-run equilibrium and should be read as evidence of a relationship and not proof of permanent job destruction.

3.3 Governance Lesson

The draft South Africa National Artificial Intelligence Policy was formally withdrawn through General Notice 3978, published on 12 June 2026 (Department of Communications and Digital Technologies, 2026, p. 3). This provides an opportunity to strengthen the evidence base and evaluation arrangements underpinning future policy. Reliable sources, clearly assigned institutional responsibilities, and transparent monitoring of productivity and employment outcomes should guide implementation. The policy lesson is therefore to pursue adaptive, evidence-based governance rather than to reject regulatory intervention.

4. Education Redesign

4.1 Alignment failure

Existing structures for funding do not always incentivise good labour market outcomes, nor do they drive speed of alignment to changes in employer demand.The 2026 World Bank Report points out that there are issues of coordination among education, labor market demand, and workplace learning with no one institution taking responsibility for managing all parts of the pipeline (World Bank, 2026:41)

4.2 Outcome- linked Funding

Subsidies need to contain a retention-weighted component (e.g. release of subsidy payments contingent upon graduates having secured and retained employment). Verification could be achieved using administrative records and taking into consideration relevant data access/privacy issues.

Proposals also included provisions which would take account of differences in employment prospects among participants and provide for demonstration that disadvantaged students were recruited and provided support. Proposals also made provision for performance assessment measures to reflect outcomes in terms of placements and/or retention rather than simply on the basis of enrolments.

4.3 Cross-Disciplinary AI hybridisation

Public funding should support modular micro-credentials in combinations such as AI and agronomy, AI and logistics, and AI and audit and not only specialised AI degrees. This illustration drives industry-specific innovation as it builds a highly adaptable, cross-functional workforce.

4.4 Real time skills intelligence

The crucial skills list and SETA allocations should be refreshed every six months using job posting analytics and SARS payroll data, closing the gap between industry demand and curriculum (World Bank, 2026:45-46). This carries a limitation of scraped vacancy data systematically underrepresenting the demand from SMMEs and the informal economy. To mitigate this bias, the system should be complemented by municipal surveys and informal trader association data. The mechanism should be treated as a directional signal and not a precise forecast (Antunes de Carvalho:2026:10).

5. Industrial Policy design

5.1 Technology adoption and Employment screening

According to the World Bank (2026), adopting an 'adopt, adapt, and advance' strategy for AI development would be most appropriate in developing economies such as South Africa, by focusing on the adoption and adaptation of existing AI technologies while reducing obstacles that hinder them from being utilised effectively.

In addition to public support, policy considerations regarding the potential effect on employment associated with investing in AI are also important as the benefits gained from increased productivity could have conflicting outcomes depending on whether there is expanding or becoming saturated demand Bessen, (2019).

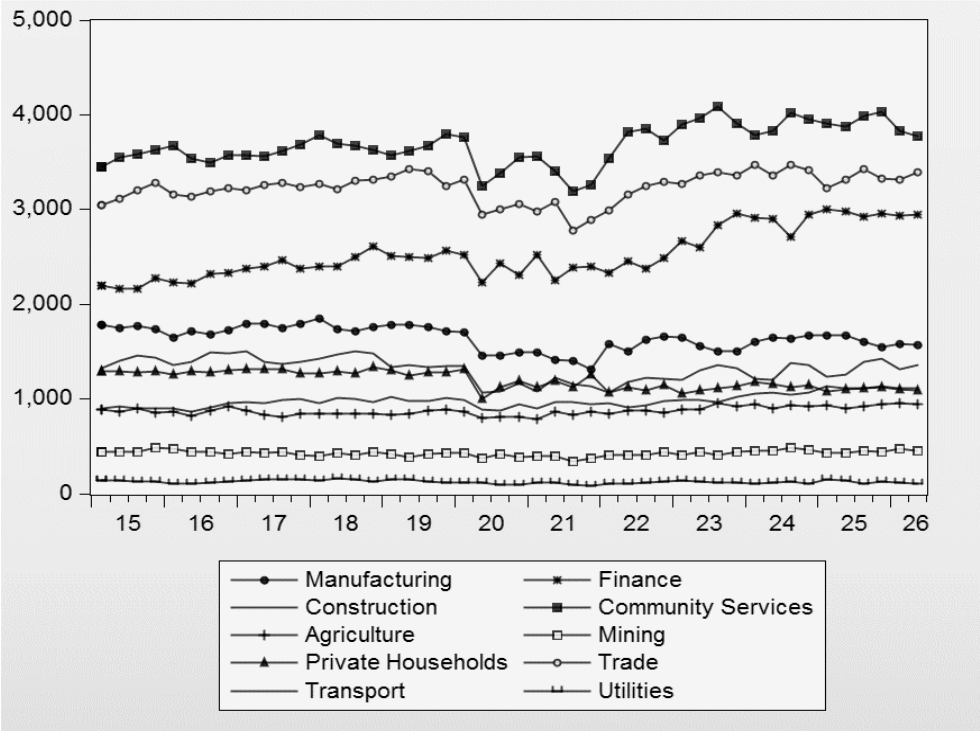
5.2 Sectoral Employment Patterns

An illustrative example based on these numbers suggests that the initial programme of 500 firms with an average public contribution of R160,000 (costing R80 million), if each trained five workers (i.e., 2500) as well as a wage-insurance component of 500 displaced workers at R40,000 per year for four years (R160 million). For an employee whose earnings decline from R10,000/month to R8,000/month, replacing 40% of the lost income (equivalent to R800/month,

i.e. R9,600/year) will cost R4.8M supporting 500 such employees. Therefore: including this component increases costs to R84.8M (excluding administrative overheads).

Note that none of these assumptions lead us to a conclusion about fiscal neutrality. To know whether there are savings from reallocating funds from existing programmes to finance this intervention requires evaluating what current spending levels exist, authorising a change in legislation, and undertaking an affordability assessment. Whether the policy should be continued beyond its initial 36-month 'sun-setting' period also depends upon measuring outcomes against targets.

Figure 1: Sectoral Employment dynamics in South Africa, 2015-2026



Source: Stats SA, QLFS compiled by Eviews

Data from the official Quarterly labour force survey (QLFS) conducted by Stats SA(2026) shows the quarterly trends of employment in various economic sectors in South Africa between 2015q1 and 2026q2.The community services and trade sector shows the largest overall employment, which displays distinctive structural hierarchies and the number of jobs associated with them,

with contracts to lower employment sectors like utilities and mining. This figure describes the distribution of employment across sectors, it does not establish AI's causal effects on jobs.

The policy recommendation that follows responds to this employment structure and the risk of displacement, rather than being derived from the figure itself. AI lowers unit costs if passed through, output may expand but employment rises only if that expansion offsets labour saved per unit. Cost reduction, pass-through and labour intensity matter.

5.3 Mechanism: AI Diffusion Hubs

Building on the existing digital infrastructure (National Treasury:2026: 144), South Africa would benefit from embedding AI diffusion hubs into its various sector masterplans for providing tradable-sector firms with access to shared computing, secure data facilities, and adoption diagnostics.

5.4 Safeguards and Bridge

First, support should carry 36-month sunset clauses based on unit-cost and export benchmarks. Second, cost-sharing should be mandated to allow firms that would have invested anyway to self-sort out. To limit compliance burdens and risks, reporting requirements should be lighter for SMMES and stricter to larger firms.

5.5 International Comparison: Germany’s Kurzarbeit

Kurzarbeit scheme allows firms to retain employees during down-turns by having the government subsidised to reduce working hours which helps buffer employment impacts. Experience of the 2008-09 period indicates that it helped to buffer the employment impact: Unemployment rose only moderately despite the dramatic reduction in output (OECD:2010:42).

Kurzarbeit is effective because of the presence of strong social partners in Germany, both unions and employer associations, which are willing to come to the table for hours reductions, and a high formal-employment rate. This is not the case in South Africa. The lesson is not, ‘Copy Kurzarbeit’. It is adjustment support to be given through existing institutions and to workers who are in formal employment.

6. FISCAL INCENTIVES REDESIGN

6.1 Map Current Instruments

There are fiscal instruments in South Africa that intersect with AI adoption, but no instruments were specifically created to address them. The 150% super-deduction is granted on qualifying R&D. The E.T.I. runs until 2029, and will provide employers up to R1,500 per month for each qualified employee earning between R2,500 and less than R7,500 with the incentive decreasing for higher earnings (SARS:2026:n.d.-c). The programs of SETAs are financed by the Skills Development Levy. Fiscal conditions are constrained; gross debt will remain at 78.9% of GDP this year (National Treasury:2026:22).

6.2 The Gap

Section 11D is skewed toward the inputs of R&D, rather than diffusion. There's no reward for transitioning at the ETI, only for hiring. A change in firm behaviour is generated by adoption and further support. Training support develops capacity in line with the industry standards. Employment support alters employment costs. South Africa is currently implementing specific tools that will support worker transition or AI diffusion.

6.3 Redesign A: Outcome Contingent Matching Grants (OCMG)

The level of public support for adopting the AI should be disbursed as co-funded projects, where the business pays 30-50% of the project cost. Payouts should be made proportionate to documented productivity and training results and not be paid up-front During this phase, over-subscribed applications could be allocated through a lottery to give a clean counterfactual for evaluation purposes in a pilot phase. Such a pilot could be funded by reallocating part of the existing industrial support budget, subject to affordability. Continuation should depend on outcomes relative to the lottery-based comparison group, recognising the opportunity cost of reallocating existing funds.

6.4 Redesign B: AI Transition Adjustment

The proposed adjustment provides up to 12 months of wage insurance to assist workers displaced by automation once they secure new employment. Its purpose would be to reduce the financial penalty associated with moving into a new job, rather than subsidising firms to replace workers. Wage insurance should deal with the earning reduction as a result of having found a new job which pays less than one’s previous salary (for instance from R10,000/month to R7,000/month).

In such case the insurance could provide for an additional amount on top of the R7,000 payment to make up a percentage point of the earnings difference between pre and post displacement employment, but only for a limited period (maximum of 12-months).(OECD:2018:170-172).The pilot would test a specified replacement rate, the spare of earnings, gap covered and evaluate its fiscal cost, take up and effect on re-employment speed and job quality. While payroll records can be helpful to confirm employment and earnings, they cannot establish on their own that automation was the cause of the loss of employment. A separate eligibility determination will be necessary.

Anti-gaming rules should contain:

- Eligibility focusing on the individual rather than youth categories, requiring proof of an automation-related Job loss to prevent gaming.
- For example, payroll records from the SARS system and EMP201 reporting may support verification of employment and earnings; a designated process would determine eligibility; a separate specified delivery mechanism which remains a design decision. (South African Revenue Service)
- Automatic audit of firms that are bigger than a certain size and/or have claimed more than a certain amount.
- Indicators for areas of sector-level automation should not be evaluated based on the firm's self-report alone.
- Challenging route for determinations (for workers and firms).

6.5 A costed pilot

The fiscal neutrality aspect can also be tested out using a modest pilot size. For example, consider the case where 500 eligible firms participate in our programme which provides co-funded support with an average public funding of R160 000/firm. Assuming such support leads on average to training five employees (with a total of 2500 trained), then assuming a parallel ‘transition’ element covering 500 verified displaced employees, the programme may require around:

- An initial investment of R80m for adoption by firms.
- An annual payment to unemployed/layoff workers who might lose 20% of their monthly earnings (R10 000/month).
- The State will provide replacement for 40% of this loss over 12 months. This equals an additional R9 600/year/worker, leading to an expenditure of R4.8m for 500 workers.

Thus, the total initial expenditure of R85m-R90m (before administration costs) represents a clear upper bound on expenditure levels under the proposed regime. It should be noted, however, that establishing fiscal neutrality does not depend upon implementing the full scale of such an initiative, but simply defining its maximum potential expenditure level. In other words, if there is no need to actually implement this type of intervention as a policy tool – because either existing schemes cover these requirements sufficiently well already, or because alternative solutions are cheaper, then the entire idea of 'fiscal neutrality' is moot.

The pilot implementation of our proposal should happen only if we can find a way to fund it without resorting to new borrowing – i.e., by reallocating spending from some scheme(s) which clearly underperformed relative to their own expectations.

7.1 Counterargument: Strict Conditions Deter SME Adoption

One could maintain that strict conditions would give adoption a bad reputation, particularly among SMEs. Tiered conditionality mitigates this by holding large firms to stricter scorecard requirements. The goal is not to prevent labour-saving technology from taking hold, but to get public support to firms not likely to adopt it, and to make sure it benefits workers as well.

7.2 Counterargument: Subsidies Socialise Costs and Private Gain

Subsidies transfer costs to the public, while providing benefits to the private sector (OECD:2026). The rules are: screens for additionality, cost-sharing mandates, time limits, and lottery-based pilots. These tools do not prevent capture, but decrease the risk that public funds are used for an investment that would have been made otherwise. Firstly, the elasticity rule adapts public support to diverse sectoral needs, preventing rigid application. Secondly, the use of AI needs to be widespread. The nature and modality of the public support needs to differ across sectors. Thirdly, training alone cannot fix weak labour demand. This is why the package

combines the wage insurance with the elasticity rule, and skills reform. Unemployment is merely reordered with a new skills policy. With adoption support (elastic sectors) and transition support (displaced workers) it contributes to a coherent adjustment system.

7.3 Synthesis

The objective is to ensure that workers share in the productivity gains generated by AI adoption. The three pillars are ineffective when they are implemented individually. Skills without adopters are reshuffled; Adopters without skills are stuck at the O-ring wall; Subsidies without conditions are lost. They work together to make a transmission mechanism. Employer demand should inform training; adoption outcomes should feed funding and the scorecard.

Table 2: Prioritised Policy Package

Policy area	Existing weakness	Proposed redesign	Responsible institution	Key risk	Evaluation metric
Education	Funding disconnected from labour market outcomes	Performance Linked Funding with retention, AI micro-credentials, real-time skills intelligence.	DHET / SETAs	Training for obsolete vacancies.	Baseline risk, placement, retention, and earnings.
Industrial policy	Limited support for diffusion among smaller, non-frontier firms.	Elasticity screening rule; AI diffusion hubs; 36-month sunset clauses.	DTIC / Master Plans	Capture of support by large firms.	Additionality relative to baseline, unit costs, and export performance.

Fiscal policy	Section 11D rewards R&D, ETI prioritizes hiring over worker transaction	Matching grants; an AI Transition Adjustment via SARS payroll infrastructure; pilot subject to treasury assessment.	SARS / National Treasury	Compliance burden and gaming of eligibility rules.	Participation by firm size and worker outcomes.

8.1 Monitoring

Annual publication of an AI Productivity and Employment Scorecard featuring 4 headline series:

- (i) Measured additionality of supported projects over the lottery control group (unit costs, export volumes, net employment)
- (ii) Placement & 12 month-retention rates across our Outcome-Linked Training cohorts (disaggregated by disadvantage status)
- (iii) Take up & re employment speed under Transition Adjustment
- (iv) Binding complementary constraints (Energy Reliability, Data Access, Management Capability), such that we may adjust Instruments accordingly.

The requirement for this Annual Publication serves to ensure that the Control Group Comparison isn't reduced to a narrative exercise, thereby closing the Evaluation Loop absent which the Withdrawn Draft Policy on AI lacks.

9. CONCLUSION

AI technologies will increase productivity only if they meet complementary constraints on skills, management, data, energy and capital. Their effects on jobs depend critically on how productivity increases are distributed across price reductions, increased outputs and novel tasks – versus simply lowering labour intensity per unit output.

This paper proposes three interlocking mechanisms for managing AI's impacts on employment: outcome-linked education funds that target both employment creation and employee skill development; adoption support for key tradable sectors where low-cost products allow large scale output growth and associated labor demand; and fiscal incentive packages which convert traditional deduction schemes into co-funded pilot programs focused on generating empirical evidence about effectiveness. Finally, we propose limited transition adjustment payments that compensate displaced workers who can show their job loss was a likely consequence of AI implementation.

Assessment of this proposal should focus on AI-enabled productivity, net employment outcomes, wage levels and inequality within those outcomes. We suggest that if AI technology adoption leads to significant increases in output without corresponding expansion of labor market participation rates, then there should be no further public sector support for such activity.

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