Navigating Change: Industrial Transformation and the Surge in High-Skilled Labour Demand - A Tanzanian Perspective.

Mosses Lufuke[1*], Mussa Mwamkonko[1] and Abiud Bongole[1]

Abstract: *Despite the ongoing economic transformation towards the non-agricultural sector in most developing countries, it remains unclear whether such dynamics are complemented by demand and absorption of skilled labour. Therefore, this paper utilizes the latest data from the 2020-2021 Tanzania Integrated Labor Force Survey (ILFS), which was conducted across all 26 administrative regions and 155 districts of the country, to examine the potential association between the transformation of the industrial structure and the absorption of a high-skilled labor force within the economy. Using a ridge regression model, the results indicate that economic transformation towards the non-agricultural sector and the employability of high-skilled labour are positively related. Moreover, even after applying a logistic regression model to test for robustness, the results remained consistent. While the data does not provide conclusive evidence for the underlying mechanisms behind these findings, we hypothesise that the quantity of education, rather than its quality, plays a pivotal role in this relationship. Furthermore, while this paper offers valuable insights into the relationship between the transformation of the industrial structure and skills absorption within the economy, the ILFS data does not allow us to pinpoint the specific areas within the non-agricultural sectors where these high-skilled workers are allocated. Conducting such an analysis would provide additional evidence for informed policy discussions.*

Keywords: Industrial Structure, Labour, Skills, Ridge Regression, Logistic Regression, Tanzania

JEL classification: C35, D63, I41

1.0 Introduction

Labour market development in the wake of industrial structure transformation has been the centre of policy debate across countries and drew considerable attention during the United Nations Industrial Development Organisation (UNIDO) affiliated "Future of Industrial Work" conference in 2019. With an increasing population in developing countries, coupled with industrial structure transformation, especially from agricultural to non-agricultural economic dependency, the debate on job creation looks unlikely to

[1] College of Economics and Management, Nanjing Agricultural University.
2 Department of Economics, The University of Dodoma
[*] *Correspondence E-Mail: lufukeson@gmail.com*

fade away anytime soon. Unfortunately, the diverging results from empirical studies around the world do not seem to help; rather, they call for a country-specific assessment of the matter. For instance, the relationship between structural transformation and job creation is positive in India (Basole, 2022), negative in Pakistan and Caribbean countries (Hall and Chuck-A-Sang, 2013; Kamal and Fatima, 2023), and not significant or only likely to exist in the service rather than the manufacturing sector in some African countries (Fox *et al.*, 2013; Fox *et al.*, 2017).

In Africa, it is generally believed that due to its uncoordinated pattern, industrial structure transformation has a negligible effect on labour force absorption (Sanfilippo, 2020). It is pointed out that, regardless of transformation, productivity growth in Africa is highly concentrated within sectors rather than between them. As a result, migrating resources such as human capital to other emerging sectors becomes a challenge. Specifically, it is questioned whether, even if transformation may lead to the creation of jobs, such created employment would be of high-skilled labour. In many countries in Africa, including Tanzania, the transformation to a non-agricultural economy is characterised by a small and informal sector (McMillan *et al.*, 2014). Therefore, whether transformation towards a non-agricultural economy attracts a high-skilled labour force similarly remains a mystery.

In Tanzania, the agricultural sector has historically played a pivotal role in the development process. Higher agricultural productivity has led to the creation of food, labour, and savings for urbanisation and industrialisation. However, this has led to a decreasing relative importance of agriculture in the overall economy, with manufacturing and service sectors experiencing growth. For instance, the contribution of the agricultural sector to GDP has been lower than that of the manufacturing and services sectors in recent years. In 2021, agriculture contributed an estimated 28.3% of GDP, while the manufacturing and services sectors contributed 32.1% and 39.6%, respectively (Ministry of Finance and Planning, 2022). Additionally, the agricultural sector has shown the lowest growth rate, averaging 5.7%, compared to 6.4% and 6.9% for manufacturing and services, respectively, between 2020 and 2021 (Ministry of Finance and Planning, 2022). Timmer (2009) states that this transformation in industrial structure is inevitable and crucial for the sustainability of economic growth. It allows for efficient resource allocation and enhances a country's ability to absorb potential economic shocks in the primary sector.

Interestingly, while the evidence of transformation from an agricultural to a non-agricultural economy is clear, and the efficient allocation of human capital skills remains vital for sustainable economic growth, it remains unclear whether such transformation in Tanzania absorbs a high-skilled labour force. Studies acknowledge that the employment of high-skilled labor has a positive impact on the innovation process, and the overall outcomes are experienced at all stages, from the firm to country levels

 https://doi.org/10.58548/2024jaep22.0112

(Klenow *et al.*, 1997; Hall and Charles, 1999; Caselli and Antonio, 2013; Jones, 2014; Schoellman, 2016; Rossi, 2022). Therefore, this paper aims to explore whether the changing industrial structure in Tanzania is accompanied by the absorption of a high-skilled labour force in the economy. It is structured into four sections. Apart from this section, section two outlines the data sources used and the model employed for analysis. In section three, the study presents and discusses the results. Finally, section four concludes the study by summarising the main findings and their implications.

2.0 Data and Method

2.1 Data Description

We utilised secondary data from the latest 2020-2021 Tanzania Integrated Labour Force Survey (ILFS), conducted by the National Bureau of Statistics (NBS) across all 26 administrative regions and 155 districts within the country. This micro-level survey involved a total of 51,751 individuals. Within the dataset, instances of missing values across multiple variables, often stemming from recording errors or omissions, were observed. Due to the challenge of revisiting individuals with such gaps, we opted to exclude these incomplete observations from our analysis. Moreover, to avoid duplicating statistics, we considered information from only one individual from each household in cases where more than one member of the household was involved in the survey. Furthermore, we focused only on responses from heads of households, resulting in a final sample size of 11,594 individuals in our analysis.

Table 1: Descriptive statistics of the variables

Variable	Description	Mean	Std. Dev.
Skilled employment ratio	Fraction of respondents with required or higher skills from the total labour force	0.350	0.297
Industrial structure transformation	Fraction of non-agricultural income from total income	0.428	0.206
Marital status	Fraction of respondents who are married	0.591	0.109
Disability	Ratio of respondents with disability	0.270	0.129
Weekly working hours	Average of respondents' working hours	4984.064	2736.2
Location of residence	Fraction of respondents who are living in the urban area	0.237	0.113
Year of schooling	Average of respondents' years of schooling	1.978	0.175
Household size	Average household size	6.418	3.994
Age	Average of the respondents' ages	25.656	21.054

Native	The fraction of respondents who are non-immigrants in a given district	0.813	0.207

Based on ILFS, we collected data such as the individual level of job skills, education level, sex, rural or urban residency, year of birth, disability, gross incomes from paid employment, in-kind, and from agriculture, non-Tanzanian persons, marital status, access to credit in the last 12 months, and household size. Using STATA-17 software, we identified respondents belonging to each district and computed district averages for all these variables. In this case, we consider the computed district values to represent the workforce characteristics at the district level. For the categorical reported variables, we converted them into proportions of occurrences of one category, as indicated in Equation 1.

$$Proportion\ or\ Fraction_i = \frac{n_j}{\sum_{j=1}^{\theta} n_j} \quad (1)$$

Where n stands for the total number of respondents in j^{th} category, θ is the number of categories in the given variable, and i represents the district. The summary of the variables is depicted in Table 1.

2.2 The model

In this paper, we employed a ridge regression model to explore the relationship between the transformation of industrial structure and the absorption of the skilled labour force into the market. Unlike standard multiple regression, the ridge regression model is an effective and efficient estimation approach, particularly when predictor variables are highly correlated (Marquardt and Snee, 1975). It allows for a slight bias in the estimated coefficients by decreasing variance, which, consequently, helps provide more meaningful estimates (Hoerl, 2020). The model is specified as

$$Y_i = \alpha_0 + \alpha_1 X_i + \gamma Z + \in_i \quad (2)$$

Whereas Y_i represents the skilled employment ratio at the i^{th} district, X_i is the fraction of non-agricultural income, Z stands for the set of control variables as listed in Table 1, $\in_i$ is the regression error term and α_0, α_1 and γ are the coefficients to be estimated.

We optimise the value of the ridge parameter (k) using the formula laid down by Hoerl *et al.* (1975), as follows:

$$k = \frac{m\delta^2}{(\sum \beta_{OLS})^2} \quad (3)$$

Where m is the number of variables, δ^2 represents variance and β_{OLS} are the coefficients of a standard regression model.

 https://doi.org/10.58548/2024jaep22.0112

Drawing on insights from previous literature, it is likely that increased demand and, consequently, openings for high-skilled labor are positively influenced by existing education (Brown, 2003; Zhongchang and Yongqiu, 2007), urbanicity (Abel *et al.*, 2012), average age (Chung *et al.*, 2015), a large share of migrants (Borjas, 2013), average family size, dual-parenthood households (Togunde, 1999; Booth and Kee, 2005; Faridi *et al.*, 2009; Chan *et al.*, 2019; Blaabaek *et al.*, 2020), as well as negatively impacted by working hours (Marcolin *et al.*, 2016), and a large number of the labor force with disabilities. By incorporating these control variables, the model becomes more adept at accounting for the diverse factors that could potentially influence employment outcomes. This approach allows us to isolate the specific impact of the changing industrial structure on employment patterns.

3.0 Results and Discussion

In the initial phase, we conducted a t-test statistic using OLS estimation, rather than ridge regression, due to a single predictor effect to evaluate the potential connection between the transformation of the industrial structure and skills absorption in Tanzania's labour market. This preliminary analysis aimed to determine if a relationship exists between these two focal variables, without considering the influence of control variables. The findings of this preliminary assessment are outlined in Table 2, indicating that the variables are statistically significant. This suggests that an increase in the proportion of non-agricultural income shares in the economy and the employment of high-skilled labour are positively related. However, as stated earlier, this outcome primarily serves to illustrate whether a discernible pattern is present, warranting further investigation.

To attain more robust and nuanced insights into the relationship between the evolution of the country's industrial structure and high-skilled employability, we introduced control variables into the model. These additional variables, as presented in Table 3, play a crucial role in isolating the distinct impact of the changing industrial structure on skills employability. Their significance lies in their ability to minimise the influence of extraneous factors, ensuring a clearer understanding of the independent effect of industrial structural shifts on skills employability.

Table 2: Simple OLS (t-test) results

	Coeff.	Std. Error
Non. Agric. Inc. Share	0.032***	0.010
Constant	0.336***	0.005

Note: Dependent variable is skilled employment ratio; *, **, and *** means statistically significant at 10%, 5% and 1% respectively.

Upon incorporating control variables into the ridge regression model, a discernible and significant relationship emerges between the transformation of the industrial structure and high-skilled employability within the Tanzanian context. Specifically, our analysis reveals a strong association between the shift from an agricultural to a non-agricultural economy and the employability of the high-skilled labour force. Remarkably, this discovery aligns harmoniously with insights gleaned from diverse sources, such as Meng (2012), Laubinger et al. (2020), Nxumalo and Dhushyanth (2020), and Sanfilippo (2020), but contrasts with Rutkowski (2006).

However, a degree of caution is warranted while contemplating the underlying rationale for this observed relationship, particularly in the Tanzanian context. The data we employ relies on self-reported responses concerning the possession of required skills for a given job. This introspective approach leaves us with an inherent limitation, precisely pinpointing the reasons behind the association between the shift from agricultural to non-agricultural industrial structures and the employment of high-skilled labour remains elusive. The data do not inherently drive us towards further investigation, especially in terms of exploring the educational quality across the nation and dissecting the nature of firms steering this industrial transformation in tandem with the quantity and nature of job opportunities generated.

Moreover, when considering a spectrum of control variables, including years of schooling, average household size, the share of non-immigrant residents, and the proportion of dual-parent households, we encounter positive and statistically significant insights. Districts endowed with a larger populace possessing higher levels of education and a large number of non-immigrant residents exhibit a higher rate of employment for highly skilled labour. Sanfilippo (2020) noted that technological progress has forced substantial value-added processes to demand high-skilled labour forces. Similarly, the rise of the global value chain has forced these value-added activities to be done outside the production process, contributing to an increased demand for high-skilled human capital. However, whether this is the case for developing countries like Tanzania is yet to be empirically proved. The same observation has been noted for districts housing a substantial number of household sizes and a large fraction of married individuals.

Conversely, urbanicity, the proportion of the labour force with disabilities, average age, and working hours are all negative and statistically significant. Of particular note is the intriguing result pertaining to the location, such that our results show that a high ratio of households living in urban areas and the employability of high-skilled labour are negatively related. Common wisdom posits that urban settings typically attract a greater share of highly skilled workers (Florida, 2017). However, our atypical finding could be ascribed to the skewed rural-urban distribution within our dataset. Indeed, this dataset skews heavily towards rural observations, accounting for 80% of the total, compared to a mere 20% of urban observations.

 https://doi.org/10.58548/2024jaep22.0112

Table 3: Ridge regression results with control variables

	Coeff.	Std. Error
Non. Agric. Inc. Share	0.541***	0.026
Weekly working hours	-0.000***	0.000
ln(Year of Schooling)	0.852***	0.084
Household size	0.000***	0.000
Disability	-0.342***	0.040
ln(Age)	-0.269***	0.075
Location	-0.090*	0.052
Marital status	2.026***	0.069
Native	0.307***	0.058
Constant	-2.128***	0.193

Note: Dependent variable is skilled employment ratio; ***, ** and * means statistically significant at 1%, 5% and 10% respectively.

Furthermore, we conducted a heterogeneity analysis to explore the magnitude of this relationship across gender. Our results, as indicated in Table 4, reveal that the relationship between the transformation from an agricultural to a non-agricultural economy and the employability of high-skilled labour is greater for females than males. Existing literature points to two main factors for higher female demand in the labour market than for men. First, there is a notion that women have relatively higher grades, making them deemed more educated and productive than males (Blau *et al.*, 2014). Secondly, for long-term employment, women's higher life expectancy makes them viewed as healthier than males, and therefore, they are considered more productive (OECD, 2013).

Table 4: OLS regression results for heterogeneity analysis

Variables	Male		Female.	
	Coeff.	Std. Error	Coeff	Std. Errors
Non. Agric. Inc. Share	0.821***	0.023	0.989***	0.025
Weekly working hours	-0.000***	0.000	-0.000***	0.000
ln(Year of Schooling)	1.795***	0.080	1.506***	0.082
Household size	0.000***	0.000	0.000***	0.000
Disability	-0.556***	0.040	-0.488***	0.039
ln(Age)	-1.706***	0.039	-0.973***	0.074
Location	-0.301***	0.055	-0.167***	0.051
Marital status	2.338***	0.072	2.473***	0.068
Native	1.076***	0.051	1.022***	0.057
Constant	-2.377***	0.173	-2.013***	0.189

Note: Dependent variable is skilled employment ratio for males and females, respectively; ***, ** and * means statistically significant at 1%, 5% and 10%, respectively.

We also tested the robustness of our basic results by employing an adjusted measure of economic transformation from an agricultural to a non-agricultural economy. We

calculated the average skilled employment ratio across all districts and computed a dummy variable, which takes the value of one for districts with equal or above-average ratios and zero otherwise. Using the same set of predictor variables, we estimated a logistic regression model, as indicated in Table 5. The results are consistent with findings from the original estimation. From the logistic regression model, we found that the odds of employing high-skilled labour are approximately thirty-four times higher than low-skilled labour when the proportion of income from non-agricultural activities rises.

Table 5: Logistic model results for robustness test

	Odds ratio	Std. Error
Non. Agric. Inc. Share	34.273***	8.744
Weekly working hours	0.999***	0.000
ln(Year of Schooling)	34.609***	12.446
Household size	1.004***	0.000
Disability	0.407***	0.142
ln(Age)	0.243***	0.064
Marital status	3.769***	2.460
Native	1.542***	0.8582
Constant	0.000***	0.000

Note: Dependent variable is a dummy variable taking the value of one for districts with equal or above average of skilled employment ratio and zero for otherwise; ***, ** and * means statistically significant at 1%, 5% and 10% respectively.

4.0 Conclusion

This paper undertakes a comprehensive exploration to ascertain whether the ongoing economic transformation of industrial structures in developing countries aligns with the acquisition of high-skilled workers from the labour market. The inquiry is spurred by the concept of securing a highly skilled labour force and the imperative of sustainability in the industrialisation process. Centred on Tanzania as a focal case, this study employs the district's share of non-agricultural income as a proxy for industrial structure. Additionally, it harnesses self-response data from individual workers to gauge their perceived proficiency in relation to the demands of their workplaces.

The outcomes gleaned from this investigation illuminate a compelling trend: as the economy pivots towards the non-agricultural sector, the likelihood of engaging high-skilled workers heightens. However, the constraints inherent in the data render it challenging to pinpoint the precise reason(s) behind the nexus between this shift towards non-agricultural sectors and the upswing in high-skilled labour employment. While plausible factors like educational quality and the upsurge in the supply of skilled labour emerge, subsequent analyses seem to attenuate the role of the former. This shift in emphasis is driven by the concurrent revelation that districts characterised by an advanced average year of schooling exhibit a heightened propensity for cultivating a high-skilled labour force.

 https://doi.org/10.58548/2024jaep22.0112

It is imperative to acknowledge that this paper's analysis is confined to a binary examination of two sectors: agriculture and non-agriculture. Consequently, while the insights offered by the findings are invaluable in unravelling the interplay between the transformation of industrial structures and the absorption of skills in the economy, they do not precisely delineate the specific domains within non-agricultural sectors where high-skilled workers are predominantly allocated post-transformation. This underscores the necessity for further studies capable of pinpointing the precise sectors where these high-skilled workers predominantly find employment post-transformation. Such subsequent studies would deliver a more intricate and nuanced policy comprehension of the intricate interrelationship between the transformation of industrial structures and the skills composition of the workforce.

Reference

Abel, J. R., Gabe, T. and Stolarick, K. (2012). Workforce skills across the urban-rural hierarchy. Federal Reserve Bank of New York, Staff Report No. 552, February 2012

Alec, R. L. (2000). The role of agricultural and female labour mobility in Taiwan's industrialisation: 1976-91. *Review of Development Economics*, 4(1), pp. 119-2000

Amin, S. and Alam, I. (2008). Women's employment decisions in Malaysia: Does religion matter? *The journal of socio-economics*, Vol. 37(6), pp. 2368-2379

Assogba, P., Kokoye, S. E. H., Yegbemey, R. N., Djenontin, J. A., Tassou, Z., Pardoe, J. and Yabi, J. A. (2017). Determinants of credit access by smallholder farmers in North-east Benin. *Journal of Development and Agricultural Economics*, Vol. 9(8), pp. 210-216

Barry, K. (1996). Industrialisation and economic development: The costs to women. In: Barry, K. (eds) Vietnam's women in transition. International Political Economy Series. Palgrave Macmillan, London.

Basole, A. (2022). Structural transformation and employment generation in India: Past performance and the way forward. *The Indian Journal of Labor Economics*, 65(July): 295-320

Blaabaek, E. H., Jaeger, M. M. and Molitoris, J. (2020). Family size and educational attainment: Cousins, contexts and compensation. *European Journal of Population*, Vol. 36(3), pp. 575-600

Blau, F. D. and Winkler, A. E. (2014). *The economics of women, men and men*. London: Oxford University Press

Booth, A. L. and Kee, H. J. (2005). Birth order matters: The effect of family size and birth order on educational attainment. The Institute for the Study of Labour (IZA) Discussion Paper 1713, Bonn

Borjas, G. J. (2013). *Labour Economics* (6th Ed.). McGraw-Hill Irwin: New York

Brown, P. (2003). The opportunity trap: Education and employment in a global economy. European Education Research Journal, Vol. 2(1), pp. 141-179

Caselli, F. and Antonio, C. (2013). The contribution of schooling in development accounting: Results from a nonparametric upper bound. *Journal of Development Economics*, 104 (C), 199–211.

Cedefop (2015). Skill shortages and gaps in European enterprises: Striking a balance between vocational education and training and the labour market, Cedefop reference series, No. 102, Publications Office of the European Union, Luxembourg, available at: http://www.cedefop.europa.eu/en/publications/3071

Chan, T. W., Henderson, M. and Stuchbury, R. (2019). Family size and educational attainment in England and Wales. *A journal of demography*, Vol 73(2), pp. 1-14

Chung, J., Park, J., Cho, M., Park, Y., Kim, D., Yang, D. and Yang, Y. (2015). A study on the relationship between age, work experience, cognition and work ability in older employees working in heavy industry. *Journal of Physical Therapy Science*. Vol. 27(1), pp. 155-157

European Commission-EC (2023). *Employment and Social Development in Europe: Addressing labour shortages and skills gaps in the EU*. Brussels, Belgium

Faridi, M. Z., Chaudhry, I. S. and Anwar, M. (2009). The socio-economic and demographic determinants of women's work participation in Pakistan: Evidence from the Bahawalpur district. *South Asian Studies*, Vol. 24(2), pp. 353-369

Florida, R. (2017). When it comes to skills and talent, size matters. *Bloomberg*. [Online] 6th July. Available from https://www.bloomberg.com/news/articles/2017-07-06/a-big-advantage-of-bigger-cities-more-skilled-workers [Accessed 12/05/2023]

Fox, L., Haines, C., Munoz, J. H. and Thomus, A. (2013). *Africa's got work to do: Employment prospects in the new century*. IMF Working Paper, WP/13/201

Fox, L., Thomas, A. H. and Haines, C. (2017). Productivity: What can Africa hope for? *International Monetary Fund*, 2017(2): 1-32

Hall, K. O. and Chuck-A-Sang, M. (2013). *Economic transformation and job creation: The Caribbean experience*. Victoria-Canada: Trafford Publishing

Hall, R. E. and Charles I. J. (1999). Why Do Some Countries Produce So Much More Output per Worker than Others?. *The Quarterly Journal of Economics*, 114 (1), 83–116

Hoerl, A. E., Kennard, R. W. and Baldwin, K. F. (1975). Ridge regression: Some simulations. Communications in statistics, 4(2): 105-123

Hoerl, R. W. (2020). Ridge regression: A historical context. *Technometrics*, 62(4), 420-42

Horbach, J. and Rammer, C. (2021). Skills shortage and innovation. *Industry and Innovation*, 29(6), pp. 734-759

Jones, B. F. (2014). The Human Capital Stock: A Generalised Approach. *American Economic Review*, 104(11), 3752–3777

Kamal, M. and Fatima, A. (2023). Structural transformation and political economy: A new approach to inclusive growth. *PLoS One*, 18(8), 1-18

Klenow, P. and Andres. R. and Rodrıguez-Clare, A. (1997). The Neoclassical Revival in Growth Economics: Has It Gone Too Far?, in *NBER Macroeconomics Annual 1997*. Volume 12, NBER Chapters, National Bureau of Economic Research. 73–114

 https://doi.org/10.58548/2024jaep22.0112

Laubinger, F., Lanzi, E. and Chateau, J. (2020). *Labour market consequences of a transition to a circular economy: A review paper*. Environmental working paper No. 162, ENV/WKP/2020/9

Leonardo, B., Matteo, F., Bernard, and Marco, S. (2021). *Service and economic development in Africa*. International Growth Centre (IGC) working paper. F-20086-NOC-1

Lloyds Bank (2023). Tanzania: Economic and political The economic context of Tanzania https://www.lloydsbanktrade.com/en/market-potential/tanzania/economical-context

Luc, C., Talip, K and Amparo, P. L. (2015). Killing the Zombie Statistics: Women contribute 60-80 percent of labour in African agriculture. [Weblog] *World Bank Blog: Africa can end poverty*. 15/June. Available from: https://blogs.worldbank.org/africacan/killing-the-zombie-statistic-women-contribute-60-80-percent-of-labor-in-african-agriculture [Accessed 12/April/2023]

Manisha, R. (2014). Women empowerment through empowerment opportunities in India. *International Journal of Management and International Business Studies*, 4(1), pp. 93-100

Marcolin, L., Miroudot, S. and Squicciarini, M. (2016). Routine jobs, employment and technological innovation in global value chains. OECD Science, Technology and Industry Working Papers, 2016/01, OECD Publishing, Paris

Marquardt, D, W. and Snee, R. D. (1975). Ridge regression in practice. *The American Statistician,* 29(1), 3-20

McMillan, M., Rodrick, D. and Verduzco-Gallo, I. (2014). Globalisation, structural change and productivity growth with an update on Africa. *World Development*, 63(C): 11-32

Meng, X. (2012). Labour market outcomes and reforms in China. *Journal of Economic Perspectives*, 26(4): 75-102

Ministry of Finance and Planning (2021). *Report on the implementation of the Istanbul Programme of Action for LDCS for the decade 2011-2020: Tanzania country report*. Dodoma: Tanzania

Ministry of Finance and Planning (2022). *The state of the national economy in the year 2021*. Dodoma: Tanzania

National Bureau of Statistics (2023). National accounts statistics by subject- National accounts tables in Excel. [Online] https://www.nbs.go.tz/index.php/en/gross-domestic-product-gdp [Accessed on 17/04/2023]

Niels, S., Jeroen, S. and Mieke, V. (2010). Micro- Macro level determinants of women's employment in six Arab countries. *Journal of Marriage and Family*, Vol. 72(5), pp. 1391-1407

Nxumalo, M. and Dhushyanth, R. (2020). *Structural transformation and labour market performance in Ghana*. World Bank Jobs Working Paper, Number 55

OECD (2021). *SIGI 2021 Regional Report for Africa*. Organisation for Economic Co-operation and Development: Paris-France

OECD (2022). Women's economic empowerment. [Online] https://www.oecd-ilibrary.org/sites/cb886beb-en/index.html?itemId=/content/component/cb886beb-en [Accessed on 12/05/2023]

Organisation for Economic Co-operation and Development (OECD) (2013). *Health at a Glance 2013: OECD Indicators*, OECD Publishing

Pauceanu, A. M., Nada, R. and Moustafa, A. (2020). Employability under the fourth industrial revolution. *Economics and Sociology*, 13(3), pp. 269-282

Premsundar, B. (2013). Women in the handloom industry: Problems and prospects. *EPRA International Journal of Economic and Business Review*, 1(1), pp.32-38

Rossi, F (2022), "The Relative Efficiency of Skilled Labor across Countries: Measurement and Interpretation," *American Economic Review* 112(1): 235–266

Rutkowski, J. (2006). *Labour market development during economic transition*. World Bank Policy Research Working Paper, WPS3894

Sanfilippo, M. (2020). *Jobs and structural transformation in developing countries*. Policy Brief No. 2: United Nations University

Schoellman, T. (2016). Early Childhood Human Capital and Development. *American Economic Journal*, 8 (3), 145–174

Timmer, C. P. (2009). *A world without agriculture: the structural transformation in historical perspective*. AEI Press, Washington, D.C.

Togunde, O. R. (1999). Determinants of women's employment in urban Nigeria: the impact of socio-cultural factors. *Journal of Asian and African Studies*, Vol. 34(3), pp. 279-297

Topal, A. (2019). Economic reforms and women's empowerment in Saudi Arabia. *Women's studies International Forum*, 76(July), pp. 1-8

UNCTAD (1998). *Trade and development report: The role, structure and performance of agriculture*. Geneva-Switzerland

Vijayanchali, S. S. and Arumuga, G. (2012). Women and employment in textile industries. *Indian Journal of Applied Research*, 1(6), pp. 100-103

William, G. (2020). Higher education and industrialisation in Tanzania. *International Journal of Development Research*, 10(11), pp. 42029-42034

World Economic Forum (2023). *Global gender gap report: Insight report*. Geneva: Switzerland

Zhongchang, C. and Yongqiu, W. (2007). The relationship between education and employment: A theoretical analysis and empirical test. *Frontiers of Economics in China*, Vol 2(2), pp. 187-211

 https://doi.org/10.58548/2024jaep22.0112