THE EVOLVING RETURNS TO EDUCATION IN POST-APARTHEID SOUTH AFRICA

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Highlights

This brief summarises findings on the returns to education in South Africa from 2001 to 2023 from a paper titled "A Paradox of Progress: Rising Education and Unequal Labour Market Returns in Post-Apartheid South Africa" (Köhler, 2024).

South Africa has experienced a substantial increase in educational attainment during the post-apartheid period, leading to a large reduction in educational attainment inequality.

The strong, positive association between education and earnings has not only persisted but has become increasingly convex.

Despite the large rise in educational attainment, the average return to education has risen from 13.6 percent in 2001 to 14.7 percent in 2023. This suggests that the increase in demand for higher-educated workers has outpaced the increase in supply.

The return to education varies across education levels and has changed over time. The return to tertiary education is now the highest, having tripled in size from 7.3 percent in 2001 to 23 percent in 2023. Concurrently, the returns to primary and secondary education have shrunk.

The return to education now varies greatly across the wage distribution. While in 2001 the return was relatively constant, over time it has become strongest towards the bottom of the wage distribution. This is primarily explained by the growth in the return to tertiary education.

By benefiting lower-wage workers more, these changes to the returns structure together with higher educational attainment have placed downward pressure on wage inequality, which nevertheless remains high.

1 INTRODUCTION

The relationship between education and earnings is one of the oldest, most extensively studied topics in social science (Montenegro and Patrinos, 2014; Deming, 2022). Thousands of estimates of the 'private return to education' now exist showing that, across the world, the more education the average worker has, the higher their earnings are. This highlights the importance of investing in education for development (Fasih et al., 2012).

This brief summarises one component of my recent analysis (Köhler, 2024) which estimates the evolving labour market returns to education in South Africa during the post-apartheid period. Using over 20 years of household survey microdata not available in the public domain, it describes how the returns to education have varied across time, racial population groups, levels of education, and the wage distribution. The analysis sheds new light on the links between rising educational attainment and a varying returns structure with more accuracy than was previously possible.

The full study, while not included here, also explores (i) educational attainment, employment, and wages across the education distribution over time; (ii) the individual contributions of rising educational attainment versus changes in the returns to education in explaining wage changes over time; and (iii) the individual contributions of differences in educational attainment versus differential returns to education in explaining racial wage gaps, and how these have evolved over time.

2 DATA

The analysis uses two datasets covering most of the post-apartheid period: Statistics South Africa's (StatsSA) Labour Force Survey (LFS) from 2001–2007 and Quarterly Labour Force Survey (QLFS) from 2008–2023. Both are nationally representative, cross-sectional surveys of about 30,000 households. Collating these datasets, I arrive at a sample of nearly 4 million working-age (15–64 years) individuals over a 23-year period.[2]

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2   I ensure all variables of interest – namely, educational attainment, labour market definitions, and earnings – are consistently defined both across and within the surveys.

Both datasets include data on earnings for the employed. The LFS earnings data used is publicly available, while the QLFS earnings data is not but was privately provided by StatsSA. While earnings data from the QLFS is publicly available, this public data includes poor-quality earnings imputations for workers who did not report them which, unfortunately, cannot be distinguished from the reported data.[3] Imputations in the QLFS have been shown to produce implausible and volatile estimates; however, reliable results can be obtained when the underlying unimputed data are used and adjusted for outliers and non-response (Wittenberg, 2017; Kerr and Wittenberg, 2021; Köhler et al., 2023; Köhler and Bhorat, 2023; Kerr, 2024). I make use of this data, which represents the longest uninterrupted series of arguably reliable wage data during the post-apartheid period.[4]

Throughout the analysis, this employed sub-sample includes all workers regardless of employment type. Earnings are adjusted for inflation (benchmarked to January 2024) and are expressed as real hourly wages. All estimates are weighted and adjusted for the complex survey designs.

3 METHODOLOGY

To estimate the average returns to education, I use conventional Mincerian earnings functions.[5] The estimates approximate the private rate of return earned on the opportunity cost of an individual's time out of the labour market to attend school for an additional year. They represent the additional wages that an extra year of education yields on average. Due to several sources of bias, these estimates are not necessarily causal; however, their magnitudes are often similar to those from quasi-experimental designs.[6]

Because earnings data is only observed for the employed, these conventional estimates need not be representative of most (58 percent) of the working-age population who are not working (such as the unemployed, students, or home-makers). To obtain estimates that are representative of the entire population, I also present 'selection-adjusted' estimates which account for selection into both labour force participation and employment using a variation of Heckman's (1979) procedure. In addition to estimating average returns, I also examine how returns vary across: (i) time; (ii) South Africa's four racial population groups; (iii) different levels of education; and (iv) the wage distribution.[7]

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3   The LFS data does not include any such imputations.
4   A discussion of the data and adjustments are available in Köhler (2024).
5   Applying Ordinary Least Squares regression, these parsimoniously relate wages to years of education as well as years of potential experience and its quadratic term. As discussed in Köhler (2024), I refrain from including additional explanatory variables as these may introduce additional sources of bias and, crucially, prevent the relevant estimates from being appropriately interpreted as a rate of return.
6   See Gunderson and Oreopolous (2020), Patrinos and Psacharopoulos (2020), and Deming (2022).
7   Köhler (2024) provides a more detailed and formal description of the methods used.

Before examining the returns to education, it is useful to contextualize them within South Africa's rapidly evolving education landscape.

1. **South Africa has experienced a substantial increase in educational attainment during the post-apartheid period.**

Figure 1 presents trends in the distribution of educational attainment. The average working-age individual had 8.5 years of education in 2001, which grew by 25 percent to 10.6 years by 2023. This increase is explained by growth of both completed secondary and tertiary education alongside a contraction of primary education. By 2023, nearly half (46 percent) of the working-age population had at least completed their secondary education ("matric"), growing from just over one quarter (27 percent) in 2001. As a consequence, **educational attainment inequality has reduced** by 40 percent.[8] These patterns are likely explained by supply- and demand-side factors such as the government's prioritisation of education expansion and reform following democratisation alongside technological change favouring higher skills in the labour market.

FIGURE 1: Distribution of educational attainment among the working-age population, 2001–2023
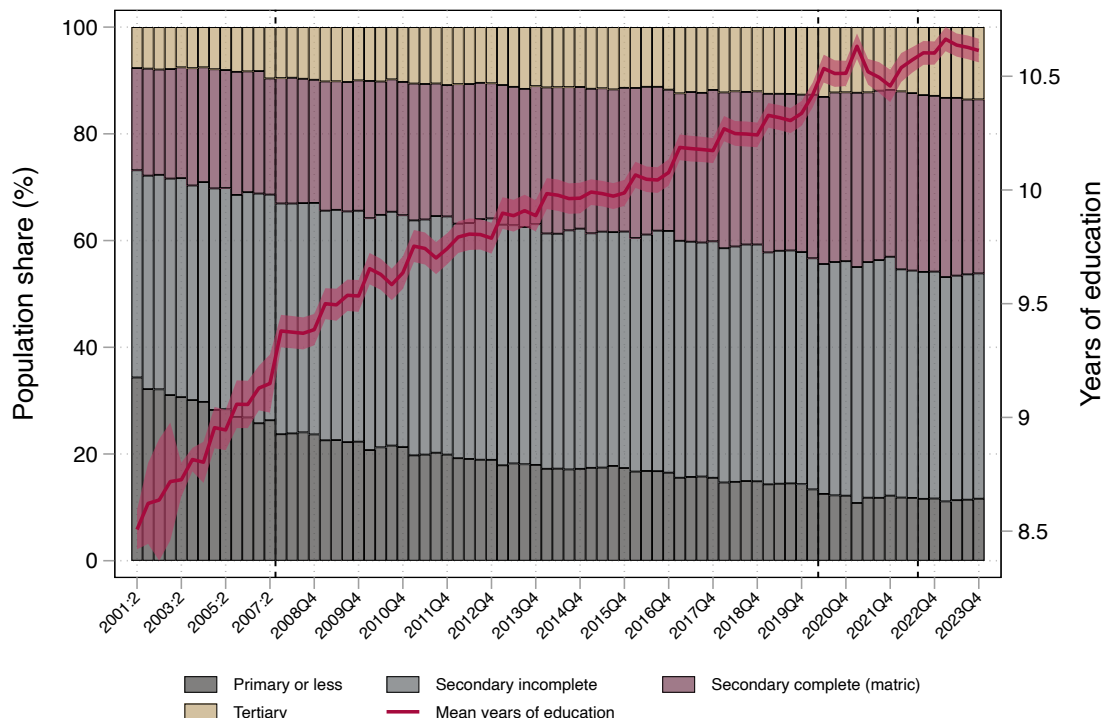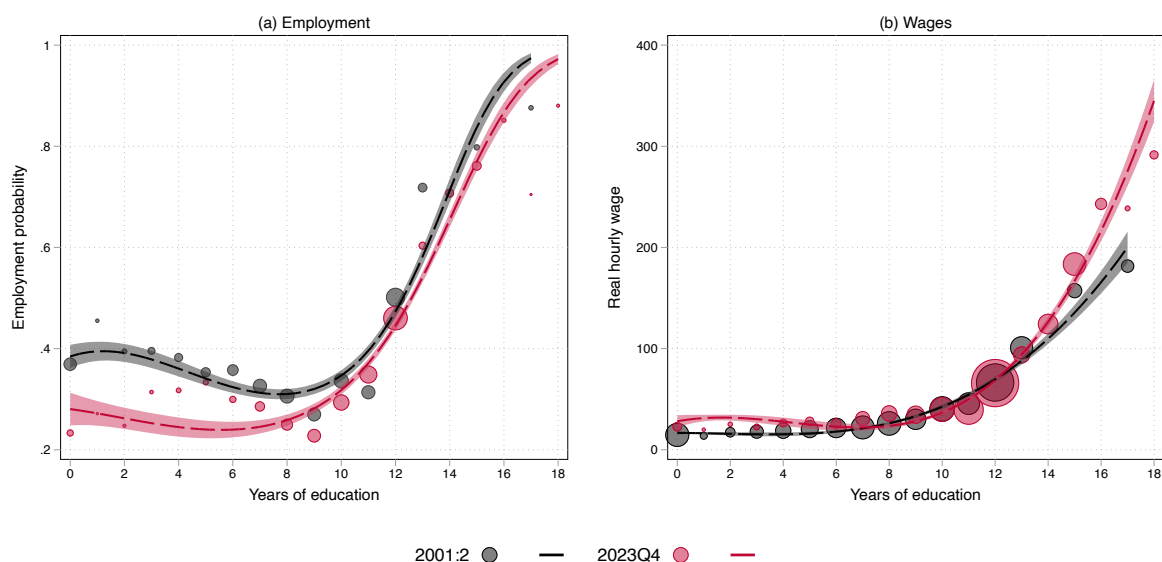

Source: Köhler (2024).
Note: From left to right, the vertical dashed reference lines refer to the change in the survey instrument in 2008, the onset of the COVID-19 pandemic in 2020, and the repeal of all remaining pandemic-related economic restrictions in 2022.

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8   As per the coefficient of variation. A large reduction in inequality remains when alternative indices are used.

2. The strong, positive association between education and earnings has persisted and become increasingly convex.

Consistent with global evidence (Montenegro and Patrinos, 2014; Patrinos and Psacharopoulos, 2020), the strong, positive association between education and earnings has not only persisted but has become increasingly convex, as seen in Figure 2. While more education translates into better labour market outcomes on average, employment probabilities have reduced over time for all levels of education, especially for those at the bottom end. Concurrently, wages have risen in a 'U-shape' – that is, more for those with either low or high levels of education, but wages have remained stagnant for those in the middle. These dynamics reflect a combination of worsening aggregate labour market conditions alongside changes to the supply of and demand for workers of varying education levels.[9]

FIGURE 2: Employment probabilities and mean real hourly wages by year of education, 2001 versus 2023
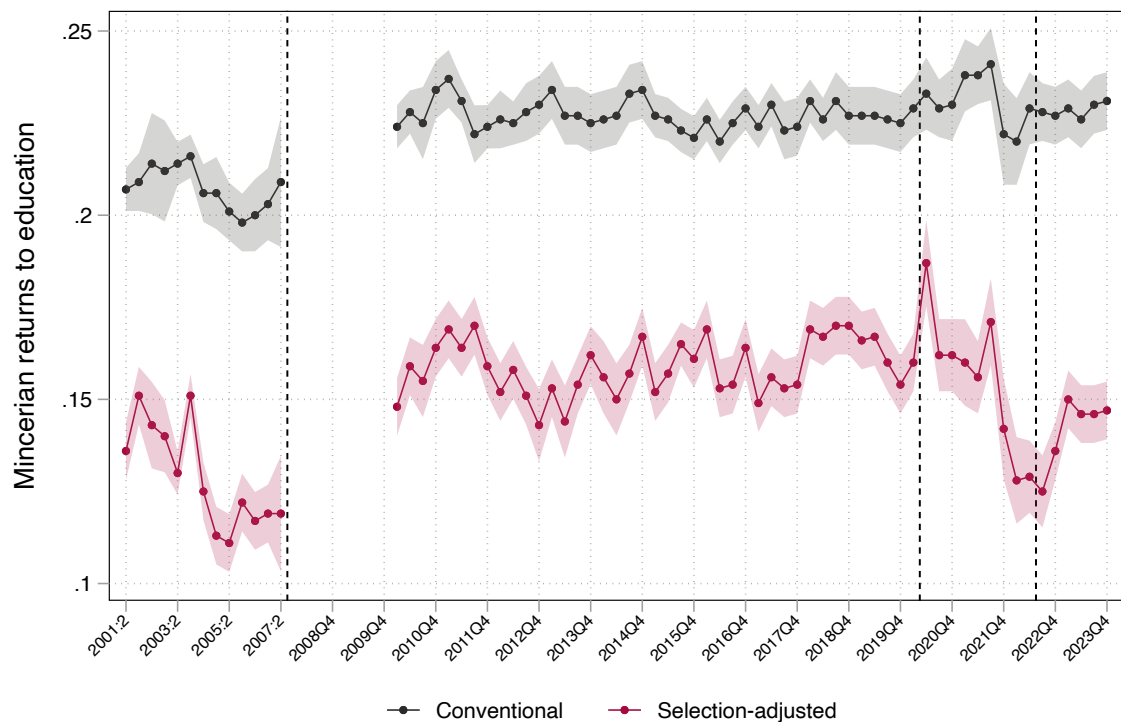

Source: Köhler (2024).

3. Despite the large rise in educational attainment, the average return to education has risen.

Although fluctuating over time, the estimates suggest that the average return to education has risen, despite the large rise in educational attainment, as shown in Figure 3. The selection-adjusted[10] return estimate has grown from 13.6 percent in 2001 to 14.7 percent in 2023, a statistically significant difference. In other words, in 2023 one additional year of education was associated with nearly 15 percent higher real hourly wages on average. This suggests that the increase in demand for higher-educated workers has outpaced the increase in supply – consistent with international trends (Psacharopoulos and Patrinos, 2018). Moreover, these returns are high by international standards, exceeding the global average of 10 percent (Montenegro and Patrinos, 2014).

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9   For instance, the wage gains observed among higher educated workers may be due to technological change favouring higher skills, while those observed among lower educated workers may be due to the roll-out of sectoral and national minimum wage legislation.

10 For completeness, both conventional and selection-adjusted estimates are presented. However, the latter are considered more empirically rigorous and are therefore preferred.

FIGURE 3: Trends in the estimated average return to education, 2001–2023

Source: Köhler (2024).
Note: From left to right, the vertical dashed reference lines refer to the change in the survey instrument in 2008, the onset of the COVID-19 pandemic in 2020, and the repeal of all remaining pandemic-related economic restrictions in 2022.

4. **There are significant differences in the returns to education across population groups and education levels.**

Changes to the average return to education mask considerable differences across various subgroups. By race, in 2001 Black African and Indian/Asian workers experienced similar, relatively low returns (12–13 percent), while Coloured and White workers experienced relatively high returns (15–17 percent). Over time, educational attainment rose for all groups but to varying degrees. For instance, the level of education of the average Black African worker rose the most by 32 percent (from a low base of 8 years), while that of the average White worker rose the least by just 6 percent (from a high base of 12 years). Similarly, the returns for most groups also grew by varying degrees. For instance, Black African workers' average return rose by 25 percent while that of White workers' rose by 11 percent. This suggests some convergence in how the labour market differentially values different group's education. Despite this, Black African workers' average return remained the lowest across all racial groups in 2023.

By education level, **the return to tertiary education has grown significantly to become the highest, while those of lower levels have shrunk**, as shown in Figure 4. This stands in stark contrast to past dynamics. In 2001, the returns to education were highest for secondary (19.5 percent) followed by tertiary (7.3 percent) and lowest for primary (5.5 percent). Over time, the returns to tertiary education have tripled in size to reach 23 percent in 2023, while

those of primary and secondary have shrunk to 3.3 and 14.2 percent, respectively. In other words, South Africa's returns structure has shifted to favour tertiary education.

FIGURE 4: Trends in the estimated return to education, by level of education, 2001–2023
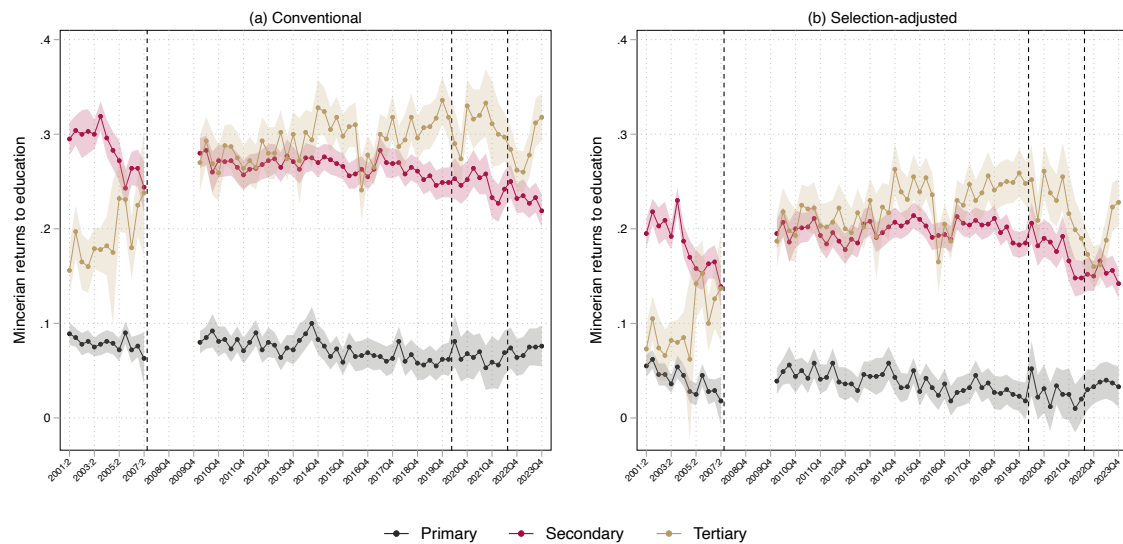
Source: Köhler (2024).
Note: From left to right, the vertical dashed reference lines refer to the change in the survey instrument in 2008, the onset of the COVID-19 pandemic in 2020, and the repeal of all remaining pandemic-related economic restrictions in 2022.

5. The returns to education have become strongest at the bottom of the wage distribution, placing downward pressure on wage inequality.

As shown in Figure 5, the returns to education were positive and relatively constant at about 15 percent in 2001. In contrast, over time the return has become strongest towards the bottom of the wage distribution and weakest towards the top. The average return among the lowest-earning 40 percent of workers grew by 37 percent, while that among the higher-earning 40 percent shrunk by 26 percent. Consequently, by 2023, the returns at the bottom were up to 2.5 times larger than those at the top. Panel (c) in Figure 6 shows that the large growth in returns among lower-wage workers is primarily explained by growth in the returns to tertiary education in particular.

By benefiting lower-wage workers more, these changes to the returns structure have placed downward pressure on wage inequality. In Köhler (2024), I show that while real wages have grown across the entire distribution, they have grown the most towards the bottom. Consequently, wage inequality has decreased – the magnitude of which depends on the measure – but nevertheless remains high.[11] Using decompositional techniques, I show that both higher educational attainment as well as higher returns to education explain wage growth across the distribution, but among lower-wage workers, the growth in returns is the dominant force.

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11   This finding is consistent with Kerr's (2024) analysis of other household survey and tax administrative data, and notably, contrasts to a rise in inequality suggested by studies which use the problematic, publicly available QLFS wage data.

FIGURE 5: Estimates of the return to education across the wage distribution, 2001–2023
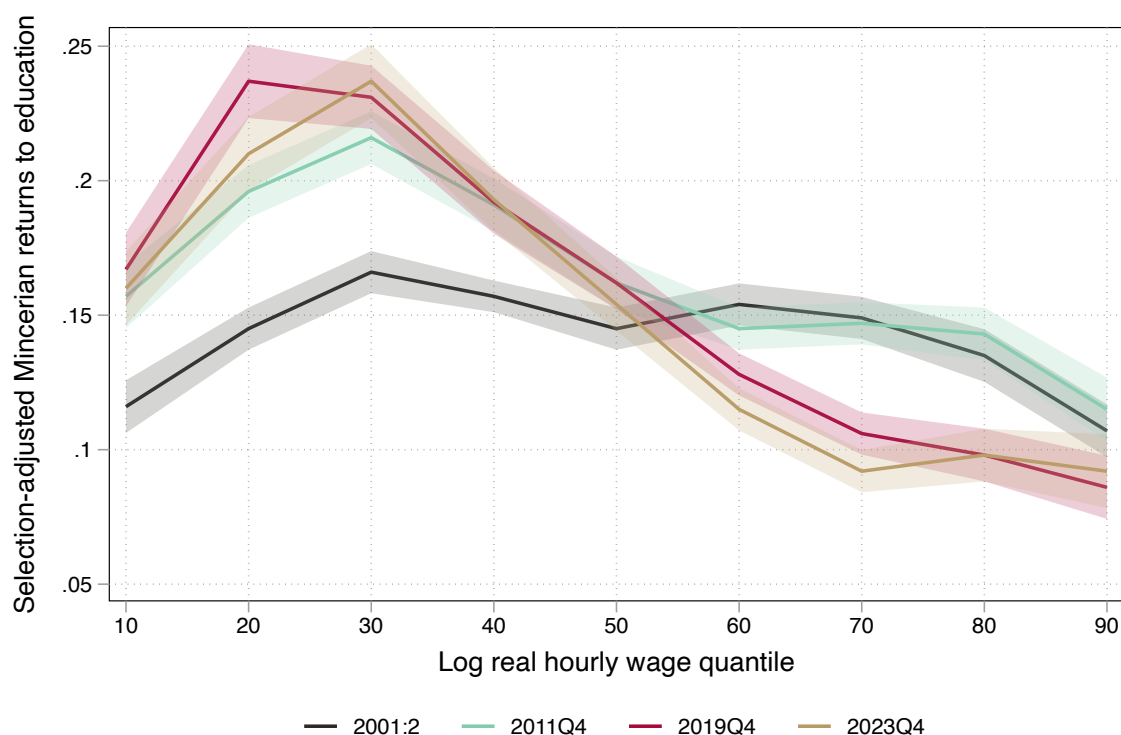
Source: Köhler (2024).

FIGURE 6: Estimates of the return to education across the wage distribution, by level of education, 2001–2023
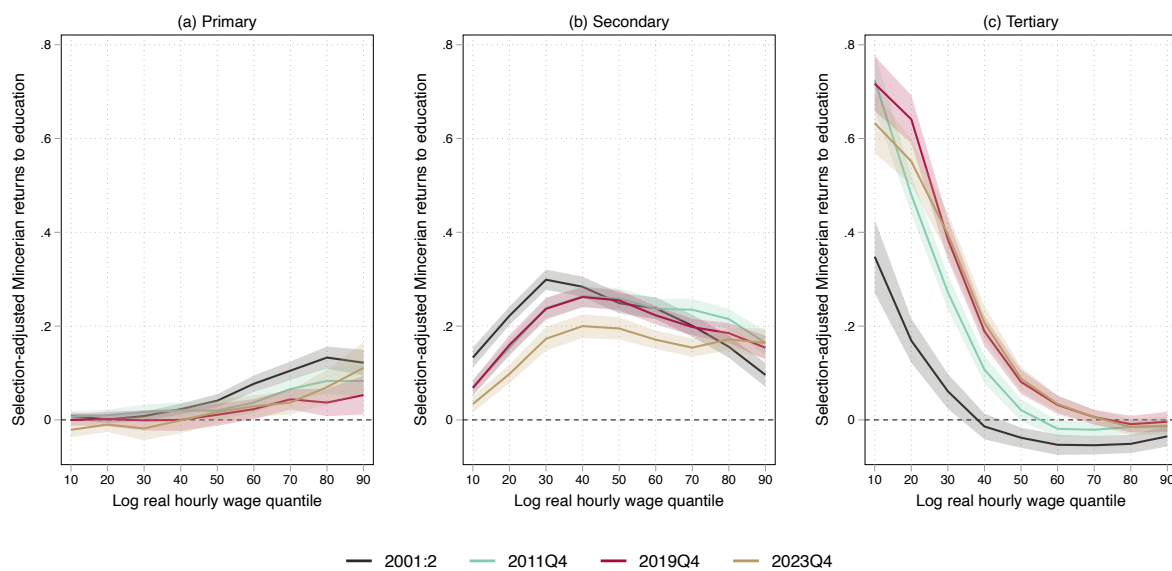
Source: Köhler (2024).

5 CONCLUSIONS AND POLICY IMPLICATIONS

Despite a substantial increase in educational attainment and consequent reduction in educational attainment inequality, the average return to education has increased. This indicates that the increase in demand for higher-educated workers has outpaced the increase in supply. Average returns, however, mask considerable differences in returns by level of education and levels of wages. The returns to tertiary education have tripled in size while those of lower education levels have shrunk over time. Consequently, the education-earnings relationship has become increasingly convex.

Across the wage distribution, rates of return, particularly for tertiary education, have become significantly stronger for lower-wage workers and weaker for higher-wage workers. By benefiting lower-wage workers more, these changes to the returns structure, together with higher educational attainment, have driven their real wages up. This has placed downward pressure on wage inequality which has reduced but, nevertheless, remains extremely high.

These findings highlight the dual roles of rising educational attainment and an increasingly convex returns structure in shaping wage dynamics and inequality in post-apartheid South Africa. While significant progress has been made, the stronger returns to tertiary education suggest that **further enhancing upward mobility and reducing educational and wage inequality requires a policy focus on targeted interventions that expand access to quality tertiary education.** Among others, these may include expanded financial aid, preparatory programmes, and greater capacity in higher education institutions. As a prerequisite, this of course also includes improving the quality of primary and secondary education. **At the same time, given that many South Africans remain unable to access further education, investment in targeted social protection and active labour market programmes, such as cash transfers, business start-up and expansion initiatives, and public employment programmes, remain essential** to not only provide immediate income relief but also foster longer-term economic participation. In the absence of such interventions, South Africa risks deepening its already extreme unemployment and inequality levels.

> FURTHER ENHANCING UPWARD MOBILITY AND REDUCING INEQUALITY REQUIRES A FOCUS ON EXPANDING ACCESS TO QUALITY TERTIARY EDUCATION ALONGSIDE CONTINUED INVESTMENT IN SOCIAL PROTECTION AND ACTIVE LABOUR MARKET PROGRAMMES.

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