Understanding Mozambique's growth experience through an employment lens

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Abstract: Over the past twenty years, Mozambique has achieved remarkable progress in promoting macroeconomic growth and stability. Nonetheless, poverty rates remain high and labour market activity is dominated by smallholder farming. We use recent household survey data to dig into these trends and provide an updated analysis of transformation in the labour market. We find that movement of labour out of agriculture has contributed to aggregate growth. But, this trend is slowing and is leading to a saturation of the services sector. Moreover, productivity growth is weakening within more labour-intensive sectors. We conclude by reflecting on policy challenges, including demographic trends.

Keywords: Mozambique, labour productivity, structural transformation, poverty, growth
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Tables and Figures at the end of the paper.

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1   Introduction

Mozambique's economy has experienced substantial change over the past twenty years. In the early 1990s, the country emerged from a devastating and prolonged conflict. Since then, aggregate economic growth has been sustained at high rates, making the country one of the top economic performers of the region. Other studies have noted that while Mozambique's growth until the mid-2000s largely reflected a process of post-war recovery, sustained growth since then is a testament to solid macroeconomic management, pursuit of a wide range of economic governance reforms, and substantial inflows of foreign aid and political stability (Jones 2006; Arndt et al. 2007; Nucifora and da Silva 2011). This is underscored by recent access to external commercial debt markets. In 2013, Mozambique made its debut USD850 million Eurobond issue with a coupon of 8.5 per cent.

Below the surface of strong aggregate economic performance lies a number of ongoing concerns. Principal among these is evidence suggesting that the pace of poverty reduction may have weakened. Data collected from household budget surveys suggest that while poverty reduced significantly from 1996-2003, there is no clear evidence of significant reductions at a national level from 2003-09 (Arndt et al. 2012a). Although this partly reflects temporary shocks, it is the absence of a convincing process of structural transformation of the economy that is more worrisome from a longer-term development perspective. Indeed, the majority of Mozambique's (growing) workforce remains reliant on low-productivity agricultural activities, and the agricultural sector has shown few signs of transformation that might provide a basis for future growth and upgrading.

Positive or growth-enhancing structural transformation is characterized by a shift of workers out of lower productivity activities and into higher productivity and less vulnerable employment. Existing experience from a range of middle and high income countries indicate that such transformation often involves comparatively rapid growth of both employment and labour productivity in modern, industrial enterprises. In so doing, modern firms operate as an engine of growth for the entire economy. However, structural transformation of this sort is also typically accompanied by productivity growth in the agricultural sector—e.g., as surplus or marginal labour is released. Concerns regarding the absence of structural transformation are not unique to Mozambique. McMillan and Rodrik (2012) use decomposition methods to argue that growth-enhancing structural transformation was largely absent in Africa over the period 1990-2005. This finding is corroborated by de Vries et al. (2013), who extend the analysis to 2010.

Existing labour market decomposition analyses for sub-Saharan Africa (SSA) are useful in describing general trends both at regional and country-levels (see also African Development Bank 2013). However, in taking a cross-country perspective they typically are unable to take advantage of the latest data and neglect important details in individual countries, such as divergent sectoral changes. As a result, careful analysis of developments within individual countries over time remains vital (e.g., see Adeyinka et al. 2013) and doing so with a focus on Mozambique constitutes the objective of the present study. Specifically, this study has three main aims. These are to: (1) provide an overview of recent economic developments in Mozambique at both the macroeconomic and microeconomic levels; (2) apply labour market decomposition tools to investigate the apparent disconnect between macroeconomic trends (GDP growth) and changes in household wellbeing (poverty reduction); and (3) consider relevant policy priorities to support a more pro-poor pattern of future growth.

The remainder of the paper is structured as follows: Section 2 elaborates on recent economic trends in Mozambique. It provides a brief historical background and compares trends across a

range of macro- and microeconomic indicators. As already hinted, this analysis raises concerns regarding the structure of growth and the extent to which growth is effectively promoting the wellbeing of the poorest. Section 3 contains the analytical core of the paper. It begins by describing the data and empirical methods used to decompose changes in Mozambique's labour market. Due to the limitations of regular official data on employment, aggregate GDP data must be combined with irregular information on employment patterns taken from household surveys. With respect to the latter, we take advantage of preliminary data from a recent household survey. Thus, the derived data encompasses the period 1996-2014, which provides an extensive view of recent labour market changes to now.

The labour market decomposition elaborated in Section 3 focuses on the distinction between within-sector productivity growth and productivity growth driven by structural change in the labour market. The results clearly show that labour reallocation effects have played a relatively small role in Mozambique's post-conflict productivity growth. Moreover, there is little evidence that sectors with relatively faster productivity growth are adding jobs at a faster rate than other sectors. In contrast, recent aggregate growth appears to have been driven by capital-intensive growth in the mining sector and by comparatively rapid growth of employment in services but typically in activities that are lower productivity than the sector average. In Section 4, we look ahead, and first focus on a set of inevitable demographic issues. They suggest that the supply of new entrants to the labour market is of a massive scale in the coming years, which underline the need to boost the demand side of the labour market. We subsequently discuss the policy implications of the trends inherent in our labour market decomposition, taking into account as well our demographic projections. Section 5 concludes.

2   Background

2.1   A brief history

Mozambique lies in south eastern Africa with borders to South Africa in the south and Tanzania to the north. Similar to other countries in the region, Mozambique experienced a long period of colonial rule. Portuguese interests in the country began in the sixteenth century and were maintained over the course of the next two centuries through various military posts, settlements, and trading companies. Expansion of Portuguese interests began in earnest in the nineteenth century, leading to the emergence of a settler economy based primarily on the production of cash crops (e.g., cotton, tea). In addition, Mozambique's major ports became important hubs for trade into other Southern African nations, especially South Africa and Zimbabwe. Following the Second World War, and as global demand increased, the Mozambican economy grew rapidly and became a destination for foreign direct investment (FDI) and large inflows of Portuguese migrants.

The 1960s saw the emergence of Mozambique's national independence movement. Based in newly independent Tanzania, the Mozambique Liberation Front (*Frente de Libertação de Moçambique*, FRELIMO) began launching guerrilla attacks into the north of Mozambique. With support from the local populace and facing a relatively weak Portuguese military presence, FRELIMO was able to gain effective control of substantial territory. Although FRELIMO had a relatively small number of active troops, their knowledge of the terrain and extensive use of land mines was effective in resisting significant Portuguese counter-insurgencies. According to one historian, white settlers in Mozambique began to feel 'Panic, demoralization, abandonment, and a sense of futility' (Henriksen 1983: 44) as the conflict continued. Facing costly and unsuccessful overseas conflicts, as well as increasing international isolation, the Portuguese government in

Lisbon was overthrown in 1974. This quickly led to a retreat from its African colonies and Mozambique achieved Independence in 1975.

The new Mozambican government faced huge challenges in the early Independence period. Perhaps most critically, mutual mistrust between the white settlers and the Mozambican population (elite) led to a huge exodus of those with Portuguese heritage (passports) and destruction of their business capital. As virtually all managerial and skilled positions throughout the economy had been dominated by these settlers, skill shortages were immediate and acute. Adding to this, the neighbouring 'white economies' of Rhodesia and South Africa viewed Mozambique's independence as an existential threat. Consequently, they sought to destabilize their neighbour by funding and training a resistance movement, RENAMO (*Resistência Nacional Moçambicana*). Global economic instability further undermined initial economic progress and, with economic support from the Soviet Union to FRELIMO, the conflict widened during the 1980s.

Without exaggeration, the 1980s were miserable for most Mozambicans. No less than one million people lost their lives, the economy shrank severely, many rural areas became highly insecure, and a large share of the population was internally displaced. Food shortages affected thousands such that, by the early 1990s, Mozambique had one of the lowest levels of per-capita caloric availability in the world. This is illustrated in Figure 1, which shows the five-year rolling average of caloric availability for Mozambique versus the Africa region as a whole, calculated from the FAO's food balance series. This shows a clear decline in food availability per capita over the period 1975-92, even from an initially low base. The sharp break in the series from 1992 marks the end of hostilities, reflecting exhaustion on both sides and the end of significant external support to RENAMO, which coincided with the move to democracy in South Africa. The transition to peace was quick and largely successful. Supported by a large UN presence, active troops were demilitarized and some integrated into a single national army.

2.2 Macroeconomic trends

The first multi-party elections were held in 1994 giving victory to Frelimo, which has retained a Parliamentary majority in all subsequent general elections (most recently in 2014).[1] Post-war economic restructuring and rebuilding began under the auspices of significant international donor support, including extensive World Bank and IMF programmes, initiated in the 1980s (for additional details see Pitcher 2002; Arndt et al. 2007). Figure 1 provides an indication of the economic turnaround Mozambique has achieved over the past two decades. As the previous sub-section described, ongoing conflict had wrecked the economy and Mozambique was amongst the poorest countries in the world as it embarked on the task of reconstruction. Using the World Bank's World Development Indicators, Figure 2 reports real GDP per capita (in 2005 US dollars) and associated per capita growth rates from 1980 (the earliest observation) to 2013. This shows that average mean incomes have doubled over the period, driven by sustained and stable real rates of growth equal to about 4.5 per cent per person per year for 1993-2013 (or more than 7 per cent on aggregate).

Mozambique's impressive rate of economic growth is substantiated by a range of other aggregate indicators. These are summarized in Table 1 for the period 1990-2013, again taken from the WDI series. Very robust positive trends are found with respect to control of inflation, reducing the current account deficit, and expanding government spending. These are not small

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[1] In line with local practice in Mozambique, 'Frelimo' is now written in lower case to mark the distinction between the independence movement and the post-independence political party.

achievements and compare highly favourably with trends in the rest of SSA. Indeed, most commentators agree that Mozambique's macroeconomic management has been competent and has provided a critical foundation to growth performance to date (Jones 2008; Nucifora and da Silva 2011). Additionally, while foreign aid flows have been and continue to be significant, at more than 10 per cent of GDP, Mozambique's aid dependence has fallen significantly over recent years. This is due to a combination of the mechanical impact of sustained GDP growth (rising more quickly than the value of aid), domestic revenue growth, and inflows of alternative sources of external finance, such as FDI and international capital investment. As noted in the Introduction, Mozambique's debut Eurobond launch in 2013 marked its place as a serious frontier investment destination.

The post-conflict period (since 1992) can be roughly divided into two main phases. The first, lasting until the mid-2000s, was characterized by a focus on stabilization, reconstruction, and consolidation of a market-oriented economy. Government intervention in the economy was scaled-back through privatizations of state enterprises and removal of price controls and other explicit distortions, in essence completing the work started in the 1980s. As early as 1994, the World Bank triumphantly noted that the proportion of GDP subject to price controls had been reduced from more than 80 per cent in 1986 to around 10 per cent. Mozambique's privatization programme was extensive and rapid, prompting a chorus of criticism and concerns regarding political interference (e.g., Cramer 2001; Pitcher 2002). Nonetheless, and despite the emergence of winners and losers from this process, robust rates of aggregate economic growth were sustained.

This period of consolidation was largely complete within around a decade. Echoing trends across the region, by the mid-2000s the natural resources sector became an explicit focus of development. In the absence of sufficient domestic capital or expertise, the focus has been on attracting foreign investment to the sector. An early project of this sort was exploration of an inland natural gas field. This was developed by the South African company SASOL, which also financed an 865 km long pipeline (completed in 1994) to take the gas for processing in South Africa. Large deposits of thermal and coking coal, abandoned after Independence, became a next priority and prompted large investments by Vale (Brazil) and Riversdale (Australia), among others. More broadly, given attractive global commodity prices and political and economic stability in the country, Mozambique witnessed an explosion of interest in its minerals sector. As shown in Table 1, FDI increased from a moderate level in the 1990s and early 2000s, growing to more than 30 per cent of GDP in the most recent period—far outstripping aid inflows. This reflects investments in the coal sector, as well as exploration of offshore gas deposits.

It is worth noting that although most resource projects remain in a start-up or preliminary phase, inflows of FDI have supported acquisition of offices, equipment, and large on-site construction. As a result, the share of recent growth attributable to this resource boom is difficult to estimate and is likely to be reflected in other sectors, such as service and construction industries. According to official figures, depicted in Figure 3, the relative contribution of aggregate economic sectors to GDP has remained broadly stable during the post-conflict period. Whilst mining has increased in relative terms over the past few years, this is from a very low base. Today as in 1996, the economy remains dominated by agriculture (27 per cent) and private and public services (51 per cent). Growth in manufacturing seen from 1998-2004 is largely explained by the establishment of the Mozal aluminium smelter (phases one and two), operated by BHP Billiton under highly favourable tax arrangements. Over the period 2005-14, manufacturing has grown more slowly than other sectors and thus has declined as a share of GDP to 18 per cent.

2.3 Microeconomic questions

Mozambique's aggregate economic track record since the early 1990s is widely applauded. An outstanding question, however, is how and to what extent these trends have been reflected in improvements in wellbeing across the population. Here something of a puzzle emerges. On the one hand, since the mid-1990s there is good evidence of steady progress on a range of social indicators. Data from Demographic and Health Surveys (DHS) support this view and are summarized in Table 2, panel (a). They show significant reductions in infant/child mortality, as well as clear gains in access to education, particularly amongst women and girls. Moreover, the table suggests that the pace of improvement appears to have quickened—i.e. annual proportional changes are larger over the period 2003-11 than for 1997-2003. This is likely to reflect a number of factors, including continued improvements in service delivery (and access), as well as the cumulative effect of ongoing investments and spillovers through achievement of greater scale.

Positive trends in social indicators are also found in other survey data, as well as in administrative statistics on coverage of basic services (Republic of Mozambique 2010). The same data sources also show broad increases in asset ownership and access to transport (for a review of this evidence see Arndt et al. 2015a). From this perspective, there appears to be no immediate disconnect between the macro and micro trends. Deeper questions emerge, though, when we review the evidence on poverty reduction. This is summarized in Table 2, panel (b), using household budget survey data. The first row reports the official poverty estimates, which is the share of population considered poor according to their estimated level of consumption, calculated following a cost of basic needs approach. This shows a sharp reduction in poverty from 1997-2003, consistent with the narrative of post-war recovery, but no clear progress from 2003-09.

Admittedly, consumption poverty estimates are subject to both sample and non-sample measurement error; therefore, they cannot be taken as exact. Multidimensional poverty metrics, which are based on more directly observable factors such as asset ownership and housing quality, provide complementary insights (for elaboration, see Jones and Tarp 2012, 2013). These indicate that the share of households deprived in multiple dimensions has followed a slightly different pattern—slow progress in the immediate post-war period and more rapid reductions since then. Combining these insights, two main points emerge. First, the share of the population that is in some way deprived or poor remains large. According to the metrics in Table 2, in 2008/2009 less than 20 per cent of the population in 2008 was found to be above both asset and consumption poverty thresholds. This underlines the need to keep in mind the severity of conditions Mozambique found herself in by the beginning of the 1990s. That is, what might appear to be a disconnect between welfare outcomes and aggregate growth is, in part, a reflection of the low base from which Mozambique has grown and the fact that processes of accumulation are necessarily cumulative and take time.

Even so and second, whatever the metric we use, the elasticity of improvements in welfare to aggregate economic growth appears relatively low. In the second period (2003-09), the share of households not in so-called asset poverty fell by around 1.2 percentage points per annum in absolute terms, or 9 per cent over the period. This compares to average real GDP growth per capita of more than 4 per cent, or a cumulative gain of 30 per cent over the six years. The implication is that the pattern of growth has not so far favoured the poorest segments of society. Moreover, in-depth analysis of the household surveys suggests this concern applies particularly to rural areas that are more distant from the capital city, which is located in the far south (Jones and Tarp 2012).

The above points raise concerns regarding the structure or nature of growth in Mozambique, especially over recent years. To what extent are these concerns justified? On the one hand, the existing set of three budget surveys, which are now dated, represents a limited basis to make such claims. Thus, it would clearly over-step the evidence base to claim that Mozambique has taken a fundamentally wrong turn in its development path. The need for caution gains force from the analysis of Arndt et al. (2012a, 2015a). These authors show that the weak consumption poverty performance in the period 2003-09 was significantly driven by a combination of climatic and external price (terms of trade) shocks in 2007/2008. Since consumption is a relatively short-term concept and safety nets including savings are limited amongst the poor and vulnerable, it is not surprising that the scope for consumption smoothing is limited. Thus, we observe sharp (regional) variations in consumption over time. At the same time, these shocks have not persisted. Therefore, in light of continued aggregate growth, it is reasonable to expect that new household survey data (in the field 2014/2015) will reveal gains in poverty reduction since 2009.

Despite these reservations, complacency regarding the extent to which aggregate growth is mapping into welfare gains for Mozambique's poorest is not warranted. An insight into recent developments comes from the Afrobarometer surveys of adults, conducted in Mozambique in 2002, 2008, and 2012.[2] These surveys have collected information (inter alia) on subjective perceptions of wellbeing, the types of deprivations experienced by households, and access to employment. Summary statistics from these surveys are reported in Table 3. These report the share of households, split by region and location, responding in specific ways to selected questions. Panels (a) and (b) refer to perceptions of own living conditions; panels (c) and (d) refer to access to some form of cash income. While the patterns are somewhat complex, there is no clear evidence of rapid or distinct improvements in either perceived living conditions or access to cash incomes over time. In rural areas, perceived conditions appear systematically lower in 2012 versus earlier periods. In addition, the share of the adult population with access to employment that provides cash income has displayed no major changes over time (2002-2012) in either rural or urban areas on aggregate. Perhaps the only systematic tendency is greater convergence between regions in both perceptions and experiences. Nonetheless, it is notable that considerably less than half of the adult population have access to a cash income; and many households regularly struggle to find any cash.

The Afrobarometer findings rely on subjective perceptions and are based on relatively small samples—e.g., the proportions in Table 3 are based on between 104 and 760 observations. Nonetheless, they point to substantial stability in the broad structure of economic activities pursued by households across the economy. Despite changes at the intensive margin, there is little to suggest there have been significant transformations in how workers make a living. This thesis is consistent with concerns raised in previous studies. Using the same series of household budget surveys, as well as a one-off labour force survey, Jones and Tarp (2012, 2013) report that the structure of employment in Mozambique has shown limited changes over the period 1997-2009. In particular, a significant minority of workers earn a stable wage income, even in urban areas. These authors also find large and persistent differences in wellbeing between households whose income derives from different aggregate economic sectors, with the largest gap being between formal sector urban wage earners, who are predominantly found in service industries, and the large share of households who are uniquely reliant on smallholder agriculture. This is indicative of large productivity differentials between sectors. Additionally, contrary to what one would expect if a dynamic process of structural transformation were underway (see Section 1),

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[2] A further round was undertaken in 2005; however, the rural/urban structure of this survey was distinct and appears less comparable.

there is no sign of inter-sectoral productivity convergence (see Gemmell et al. 2000). These concerns, which are in line with the recent Afrobarometer data, motivate a deeper investigation of recent labour market trends. This is taken up in the next section.

3   Labour market analysis

3.1   Data

The aim of this section is to analyse labour market trends in Mozambique over the post-conflict period. Before doing so, a note on data sources is helpful. As in other low-income countries, the majority of work effort occurs in the informal sector in both rural and urban areas. This sector is not monitored on a regular basis, meaning that official labour force statistics derived from administrative data, such as business or taxation records, does not provide a complete picture of trends in the labour market. Rather, irregular micro-data surveys must be used for this purpose. As alluded to above, to date three household budget surveys have been completed in Mozambique. These are the *Inquéritos aos Agregados Familiares* (IAFs) of 1996/97 and 2002/03; and the *Inquérito ao Orçamento Familiar* (IOF) undertaken in 2008/09. These surveys provide relatively detailed information about the labour market activities of each adult member of the household (e.g., employment status, sector of activity, type of work performed). More recently, a new IOF went to the field and basic, preliminary data is now available from this for the first quarter (INE 2015).

Given the value of undertaking an up-to-date analysis of labour market trends, we combine available employment data from the series of four household surveys and match it to the official aggregate sectoral GDP data, which is also available through to 2014. This is the first attempt to use these latest data sources in this way. Due to the preliminary nature of the 2014 IOF data, however, it is only possible to classify individual workers into one of four aggregate sectors.[3] These are: (1) agriculture, which includes forestry and fisheries; (2) extractive industries (*Indústria de Extração Mineira*), which also includes construction and utilities; (3) manufacturing (*Indústria Transformadora*); and (4) services, combining public administration, education, health, and a range of private commercial and financial activities. The rationale for combining utilities and construction with the extractive industries segment is because, in general, all these activities are intensive in capital. Moreover, and as discussed above, many of the new resource extraction projects are currently in a construction phase.

Matching the macro and micro data sources by aggregate sector provides a sector-specific time series on employment and output (value added). While the employment data is not observed annually, we make a simple linear interpolation between the survey years in order to fill the series. To deepen the analysis, it would have been useful to split the aggregate sectors into contributions from formal and informal activities. However, this is problematic from the output side since the survey data only captures consumption at the household level, not income. Aside from a bespoke survey of the informal sector in 2005, as well as a survey of informal manufacturing firms in 2011 (Rand and Tarp 2013), very little detail is available on informal sector enterprises in Mozambique (urban or rural). This reflects a more general problem of weak enterprise data, which suggests that the sectoral classification of GDP is likely to be rather crude. In turn, this justifies retaining a focus on very aggregate sectors.

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[3] In part, this reflects changes in the occupational categories and codes used in the questionnaires. As a result, further work will be needed to make the 2014 data consistent with previous rounds when a final dataset is released.

3.2 Methods

To analyse the employment and output series, we start by describing general trends. Here the focus is on average labour productivity, given simply by the ratio of output to employment:

$$P_{it} = Y_{it}/L_{it} \tag{1}$$

where i indexes sectors; t is time; Y is value added at constant prices; and L is the number of individuals identifying i as their primary sector of economic activity. Absolute values of P are not of particular interest. Rather, we report changes over time and compare labour productivity in each sector to the economy-wide average, denoted $\bar{P}_t$. This provides an initial view into the structure of recent growth, and is given by the ratio of output to employment shares:

$$\left. P_{it} \middle/ \bar{P}_t \right. = \left. (Y_{it}/L_{it}) \middle/ (\bar{Y}_t/\bar{L}_t) \right. = \left. (Y_{it}/\bar{Y}_t) \middle/ (L_{it}/\bar{L}_t) \right. \tag{2}$$

Other descriptive statistics, such as a comparison of changes in labour shares to the level of labour productivity have been used elsewhere (ADB 2013), and provide complementary insights. To go further, however, a more formal decomposition is warranted. This aims to identify the principal drivers of changes in aggregate labour productivity over time. These changes arise from different sources—differential trends in employment growth (within and between sectors), as well as output gains occurring through acquisition of capital (technology). Put differently, it is instructive to learn whether sectors with rapid productivity growth are also sectors that are significantly attracting new workers. Identifying the drivers of changes in aggregate labour productivity indicates the extent to which aggregate GDP growth is associated with transformation in the underlying structure of the economy.

Following Dumagan (2013) (also, de Vries et al. 2013), changes in aggregate labour productivity can be decomposed into three main components: within-sector productivity changes (the intra-effect); the contribution due to the reallocation of labour across sectors, holding productivity fixed (the Denison effect); and a dynamic structural reallocation effect, given by the interaction between productivity growth and relative labour growth (the Baumol effect). The second effect is positive when workers are moving from lower to higher productivity sectors, yielding a static gain. The third term is positive when those sectors experiencing employment growth are also experiencing positive productivity gains. Not only is the overall magnitude of these three effects of interest, we are also concerned to understand how different sectors contribute to each component. Thus, with four sectors and three effects (per period), there are 12 quantities of interest.

The three components can be calculated relatively easily from the output and employment time series. To do so, note that aggregate labour productivity is a weighted sum of sector-specific labour productivities:[4]

$$\bar{P}_t = \sum_{i \in I} \left. Y_{it} \middle/ \bar{L}_t \right. = \sum_{i \in I} \frac{P_{it} L_{it}}{\bar{L}_t} = \sum_{i \in I} P_{it} \omega_{it}^L \tag{3}$$

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[4] Superscripts on the share terms denote the variables from which they are derived—i.e.,: $\omega_{it}^L = L_{it}/\bar{L}_t$; $\omega_{it}^P = P_{it}/\bar{P}_t$, etc.

Thus, the change in aggregate labour productivity between two periods (t and t-1) can be separated into the contributions from pure changes in productivity in each sector and changes in labour shares. That is, denoting the absolute productivity change in a given sector as: $P_{it} - P_{it-1} = \Delta P_{it}$, we have:

$$\Delta \bar{P}_t = \sum_{i \in I}(P_{it}\omega_{it}^L - P_{it-1}\omega_{it-1}^L)$$

$$= \sum_{i \in I}(\Delta P_{it}\omega_{it-1}^L + P_{it}\Delta\omega_{it}^L) \tag{4}$$

The expression in equation (4) is reminiscent of the Oaxaca-Blinder decomposition technique. The first term on the RHS captures changes in labour productivity holding labour shares constant, which is the intra-effect. The second term captures changes in employment shares holding labour productivity fixed, which refers to labour reallocation effects.

The decomposition in equation (4) can be re-expressed as relative contributions to productivity growth. Thus, dividing the previous expression by aggregate productivity at time *t-1* gives:

$$\bar{g}_t^P = \frac{\Delta \bar{P}_t}{\bar{P}_{t-1}} = \sum_{i \in I}(\Delta P_{it}\omega_{it-1}^L + P_{it}\Delta\omega_{it}^L)/\bar{P}_{t-1}$$

$$= \sum_{i \in I}\left(\frac{\Delta P_{it}}{P_{it-1}}\frac{P_{it-1}}{\bar{P}_{t-1}}\omega_{it-1}^L + \frac{P_{it}}{P_{it-1}}\frac{P_{it-1}}{\bar{P}_{t-1}}\Delta\omega_{it}^L\right)$$

$$= \sum_{i \in I}(g_{it}^P\omega_{it-1}^P\omega_{it-1}^L + \Delta\omega_{it}^L[1 + g_{it}^P]\omega_{it-1}^P)$$

$$= \sum_{i \in I}\omega_{it-1}^P(g_{it}^P\omega_{it-1}^L + \Delta\omega_{it}^L[1 + g_{it}^P])$$

$$= \sum_{i \in I}(g_{it}^P\omega_{it-1}^Y + \Delta\omega_{it}^L\omega_{it-1}^P + \Delta\omega_{it}^Lg_{it}^P\omega_{it-1}^P) \tag{5}$$

As required, the three terms on the RHS of equation (5) respectively denote the relative contributions to aggregate productivity growth of: within-sector productivity growth, static labour reallocation, and dynamic labour reallocation. As Dumagan (2013) elaborates, this decomposition is exact when used with a constant price output series, as here.

3.3 Results

The previous sub-section outlined a range of analytical tools that can be used to investigate how the structure of output and employment has co-evolved over time. Applying these to the Mozambican series, Figure 4 illustrates trends in sectoral employment shares. Combining these with sectoral shares of real output (see Figure 3) indicates trends in the relative productivity of each sector versus economy-wide labour productivity (ω_{it}^P). Stated in log terms, bars that are under zero indicate sectors with below-average productivity. In addition, a unit change on the *y*-axis is consistent with an approximate doubling of labour productivity. Thus, larger gaps between sectors are indicative of wider inter-sectoral labour productivity differences.

The two figures are very informative. Consistent with earlier data, we find that the majority of Mozambicans continue to be employed in (smallholder) agriculture. As shown in Figure 4, this sector accounts for more than two in every three workers. Nonetheless, the agricultural labour share appears to have fallen rapidly between the two most recent surveys—from 79 per cent of workers in 2009, to 72 per cent in 2014. While part of this difference may simply reflect the

preliminary nature of the 2014 data (to be revised), it is consistent with indications from agricultural survey data of a trend shift out of agriculture in certain areas (especially the South). This decline has been offset by a corresponding increase in the labour share of the services sector. The other aggregate sectors (mining and manufacturing) account for less than one in every twenty workers and show no material changes in their overall shares of employment.

Figure 3 indicated that, aside from a small increase in the output share accounted for by the mining sector and a small decline in the contribution from manufacturing over the most recent period, output shares have remained broadly constant over time. In turn, Figure 5 indicates that productivity differences between sectors have diverged, particularly in the latest period (2009-2014). This has been driven by two trends—a significant increase in labour productivity in the mining sector; and a relative decline in labour productivity in both services and manufacturing. At the same time, agricultural labour productivity has remained low and stable (in relative terms) at around half of the economy-wide level of productivity. This does not mean that labour productivity in agriculture has been stagnant. Rather, it has roughly tracked aggregate productivity growth. Specifically, between 2009 and 2014 the latter grew by around 25 per cent, or an average of around 4 per cent per annum. For the same period, we estimate agricultural productivity grew by around 3.5 per cent per annum. However, labour productivity in mining grew by an average of more than 35 per cent per annum during this period—i.e., increasing about fivefold.

Figure 6 plots the relative level of labour productivity against changes in labour shares for the four sectors for two periods: 1997-2005 and 2006-2014. Following the African Development Bank (2013), of particular interest are sectors located in the positive quadrant—i.e., that show relatively high labour productivity and increases in their share of employment. In transition and developing economies, we typically see large differences in labour productivity between sectors. However, for those economies undergoing positive and dynamic structural transformation we often see that it is higher productivity sectors that are able to attract more labour. The Mozambican data suggests the economy is in transition. Labour productivity in agriculture is lower than productivity in any other sector by a factor of at least two (see also Jones and Tarp 2012, 2013). Consequently, movement of workers out of agriculture and into other sectors (or relatively faster employment growth in the latter) is consistent with a trend increase in economy-wide labour productivity. Even so, the figure gives rise to concerns. First, the only sector in the positive quadrant is the services sector. Moreover, labour productivity is falling in this sector, which suggests that new workers in this sector tend to operate on an informal basis and undertake activities that are more precarious relative to existing workers. Additionally, sectors experiencing the highest labour productivity growth, namely mining, are not creating new employment posts in line with the pace of new entrants to the economy. Not only is this a small sector in employment terms, it is getting smaller as the working population expands.

The previous discussion hints at results from the decomposition analysis (equation 5). This is summarized in Table 4, which reports mean absolute and relative contributions to average annual aggregate productivity growth by component (intra-sector productivity effects [intra], static reallocation effects [SRE], and dynamic reallocation effects [DRE]), by sector and by period (1997-2002, 2003-08, 2009-14). For the absolute estimates, in each period the sum of the component-sector cells gives that period's total aggregate productivity growth, or 100 per cent in the case of the relative contributions. For instance, in the latest period aggregate productivity growth averaged 4.2 per cent per year, composed primarily of the intra effect (81 per cent). Labour reallocation (structural change) effects in the same period, given by the sum of SRE and DRE, contributed less than 20 per cent of overall productivity growth.

Four key findings emerge from the table. First, as already indicated, labour reallocation effects have played a relatively small role in Mozambique's post-conflict productivity growth. Compared to later periods, reallocation made the largest relative contribution in the immediate reconstruction period (1997-2002), at around 32 per cent. This underlines the thesis that the underlying drivers of Mozambique's growth have shifted over time. Second, the same point is supported by evidence that the composition of these labour reallocation effects have altered. In particular, the dynamic component has turned negative, which reflects the finding that sectors with the fastest (slowest) rates of growth in employment are also sectors with falling (increasing) relative productivity. In the most recent period, this negative dynamic effect reduced the contribution of structural change to aggregate productivity growth by around 20 per cent. It is important to keep in mind, however, that the static reallocation effect in the latest period (i.e. absent the negative dynamic effect) was reasonably large and positive. This means that sectors are adding jobs at quite different paces (either through new entrants or through job changes) relative to 2003-2008; even so, the productivity level of the new marginal worker added in the services sector is lower than that of existing workers, on average.

Third, a related issue is that while the intra effect remains the predominant overall contributor to aggregate productivity growth compared to structural change, within-sector productivity growth—which also captures workers moving within the same sector from lower to higher productivity activities (e.g., from smallholder to commercial farming)—is highly uneven. Of most concern is that in all sectors excluding mining, the sector-specific intra effects are smaller in magnitude in the latest period versus the two earlier periods. Put differently, absent the mining sector, inherent within-sector productivity growth appears to be weakening. Indeed, this growth has turned negative in services and manufacturing, meaning that workers are less productive in these sectors on average than before. This raises profound questions regarding the sustainability of Mozambique's current rapid rates of aggregate economic growth, particularly given current slack in global commodity prices. Additionally, such trends corroborate earlier disquiet regarding the extent to which growth is translating into widespread improvements in wellbeing.

Fourth, the analysis suggests that aggregate productivity growth has become increasingly dependent on dynamics in the services sector. This is indicated by the 'total' columns of Table 4. These report the sum of the component effects for each sector and show that services accounted for two thirds of aggregate productivity growth in 2003-09, compared to 51 and 29 per cent in the earlier 2 periods. The corollary of this insight is that the contributions of other sectors, including both agriculture and manufacturing, have declined over time. Indeed, the strong contribution of manufacturing witnessed in the first period was almost entirely dependent on the establishment of a single large firm (Mozal), attracted by a highly preferential taxation structure. In addition, despite providing the majority of the population with a livelihood, agriculture contributed only 13 per cent to aggregate productivity growth in 2003-09. Again, this endorses concerns regarding the extent to which growth in Mozambique is pro-poor.

4 Looking ahead

4.1 Challenges

The previous section analysed past developments in the labour market to shed light on Mozambique's recent growth experience. The results highlighted important changes in the structure of growth and raised concerns regarding both the sustainability and poverty-reducing capacity of the current growth 'mode'. The latter appears to be dominated by two main currents: (1) rapid productivity growth in the mining sector, intensive in capital, and contributing relatively few new jobs; and (2) expansion of the services sector, largely in lower productivity activities.

Given that the vast majority of the workforce are engaged in low-productivity informal activities (e.g., smallholder agriculture), a guiding assumption of this section is that the qualitative nature of growth will need to change in order to achieve rapid improvements in wellbeing across the population. Moreover, such changes are likely to be necessary to sustain high rates of growth per se.

Future challenges need to be considered in light of demographic trends. Fertility rates remain high in Mozambique. This means it is inevitable that the working-age population will expand rapidly over the next generation. Table 5 sets out the UN's baseline projections for the working-age population (aged 15-64) for the period 2010-50. The first column gives the total number of potential workers, which is projected to rise from 14.7 million in 2015 (not shown) to 35.8 million in 2050. This represents a growth rate of around 3.6 per cent per annum and means that by 2025; more than 500,000 new workers will be entering the labour market each year. On the one hand, and given the present structure of growth, this represents a significant challenge and raises the spectre of conflicts over productive resources (e.g., land) and even social unrest if levels of wellbeing do not improve.

On the other hand, there is a potential demographic divide. This comes from a relative reduction in the share of dependents (non-workers) in the population. As shown in Figure 8, the current dependency ratio is more than 45 per cent, meaning there is around one dependent for every potential worker. According to the projections, by 2050 this ratio is expected to decline to around 35 per cent, thereby reducing the effective burden on workers and raising possibilities for greater productive investments in the economy. Furthermore, the quality of the working population is set to change as access to schooling increases. To model this, we use data from Barro and Lee (2013), which reports the mean years of schooling of 15-19 year olds in multiple countries since the 1950s at five-year intervals. Using this data, we estimate the expected rate of growth in years of schooling conditional on its current level. This is necessary since years of schooling is bounded, meaning that as one approaches a theoretical maximum of (say) 15 years, growth rates must decline. We undertake these estimates at the 25th, 50th, and 75th percentiles of the distribution of cross-country human capital growth rates.[5] These imply different paths for how the mean years of schooling of any given country will evolve, conditional on the starting level. The path at the 75th percentile would be consistent with the top 25 per cent of all historically observed conditional growth rates (regardless of country or period).

We apply these estimates to the demographic projections for Mozambique. Specifically, we allow the mean years of schooling of the 15-19 age cohort, which are taken as (potential) new labour market entrants, to evolve according to either the 25th, 50th, or 75th percentile estimated growth paths. The latter is taken as a reasonable upper bound on what Mozambique can achieve, and the first a lower bound.[6] We additionally assume that years of schooling remains fixed after the age of 20. As a consequence, growth in the overall mean years of schooling, encompassing all members of the working-age population, is uniquely generated by new labour market entrants. Thus, the overall mean years of schooling will change only gradually over time. Starting values

[5] These estimates are based on quantile regressions where the dependent variable is the observed (annualised) growth rate in the mean years of schooling over a five-year period and the explanatory variables are the initial level of schooling and population size. Coefficient estimates from these regressions are used to construct our growth paths.

[6] The notion here is that Mozambique must sustain rates of growth in mean years of schooling according to these paths over a period of 40 years. Since the growth paths are estimated from the full distribution of schooling year growth rates, the upper (lower) part of this distribution is populated by country-period observations that are often not sustained over long periods. Thus, our focus on the 25th-75th band is reasonable.

for 2010 are taken directly from observed mean years of schooling for each age group of five years (as per the projections) from the 2008/09 survey.

Table 5 reports aggregate results of our projections using the median (50th percentile) growth path. Figures 9 and 10 plot the same estimates including the confidence interval (i.e., 25th lower and 75th upper bounds) plus a disaggregation by gender. A first point to note is that years of schooling are presently low—only around one in four workers has a completed primary education (seven or more years of schooling). This reflects the predominantly rural nature of the work force and historical legacies. At the median of the observed historical conditional cross-country human capital growth rate distribution, we predicted that average years of schooling should double by 2050 to 6.6 years. In turn, this implies that more than 40 per cent of the working-age population should have attained a basic level; under the upper bound scenario, this share reaches around 50 per cent by 2050. Assuming increased literacy and numeracy imply a greater capacity to adopt (use) modern technologies, this raises scope for greater innovations and transformations across sectors. Moreover, these developments portend the likely emergence of thicker and more qualified markets for labour (in both rural and urban areas), which may stimulate larger-scale investments. Even so, the flipside is that many workers will remain poorly educated. Transformation in the quality of the labour force will be slow and possibly uneven.

4.2   Policy priorities

Looking forward, a key question is what *kinds* of government policies are most likely to alter the shape or pattern of growth toward a pattern that is more pro-poor. Here an important distinction is between macro-structural policies and microeconomic sectoral policies. The former can be best described as policies that affect economic incentives and behaviour across large swathes of the population (people, firms, and sectors), without necessarily targeting specific markets or sub-groups.[7] Examples include public investments in infrastructure, general legal or tax reforms, as well as monetary and exchange rate policies. Microeconomic sectoral policies refer to more specific, targeted interventions that often seek to address market failures or efficiency losses in specific sectors. Examples include active labour market policies, such as employment subsidies, or investments in labour market information systems.

Without ruling out the role of microeconomic policies, there are good reasons to suggest that efforts should focus on deploying macro-structural policies to enhance the quality of growth. A main reason is simply the massive scale of the jobs challenge. The demographic projections noted above mean that Mozambique needs to run just to keep up. The number of projected new labour market entrants per year is larger than the absolute number of workers currently found in the formal sector (i.e., who receive a regular wage). Consequently, it is difficult to see how targeted microeconomic policies, which naturally tend to be directed toward legally incorporated entities and/or the visible (formal) sector, can have an adequate footprint even if undertaken on a large-scale.

A second reason to focus on macro-structural policies is that state capacity is weak. Not only are there few examples of unambiguously effective microeconomic development interventions in present-day Mozambique; the government also plays a minimal role in most sectors except as a major purchaser of goods and services. Thus, in the short- to medium-term, any kind of step change in the role and effectiveness of sector-specific microeconomic interventions is not realistic.

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[7] Macro-structural policies include certain elements of industrial policy, including infrastructure investments and exchange rate management since these affect multiple sectors at once.

What can be done to raise the quality of growth? In keeping with previous studies, we recommend that considerably increased priority must be given to raising productivity in the agricultural sector (for an early view of this thesis see Tarp et al. 2002; also Jones and Tarp 2012, 2013). Since the majority of households are reliant on agriculture and this sector shows significantly lower levels of labour productivity relative to other sectors, progress must be made in transforming agriculture in order to achieve significant poverty reduction. In this view, any broad-based interventions in agriculture are macro-structural in nature since they cut across the rural sector and feed into urban dynamics—e.g., through living costs. Moreover, raising rural incomes will be important to moderate migration out of agriculture into informal urban activities.

We believe two main rural (agricultural) policy initiatives merit attention. The first is to draw-in private sector energy and creativity to raise rural incomes. Presently, modern private sector entities face few incentives to engage directly with rural producers. Among other things, this reflects poorly coordinated and integrated value chains, high transaction costs, and low market predictability (e.g., due to climatic and other factors). Lessons can be learnt from various Asian countries regarding how structural interventions in staple food markets played a crucial role in their development successes. As Timmer and Dawe (2007) describe, this does not require large-scale public interventions in food markets, rather the creation of a clear and stable set of incentives for private buyers, which in turn supports domestic price stability. Existing pockets of agricultural success in Mozambique point in this direction. For instance, contract farming schemes in tobacco, cotton, and cassava (used to produce beer) have been shown to boost incomes. Hanlon and Smart (2014) also point to success in development of a more integrated value chain running from production of chicken feed (soya) by emergent commercial farmers to domestic chicken production.

A second and related macro-structural intervention is to focus a larger share of public investments on rural areas, with a key aim of fostering market linkages. A recent infrastructure diagnosis notes that 'Mozambique's connectivity among urban and economic clusters is quite limited, lacking linkages that connect parallel corridors to each other. … Additionally, rural population accessibility to domestic markets … is an enormous challenge, and lags behind what is observed in the region' (Dominguez-Torres and Briceño-Garmendia 2011: 8). Supporting this view, Arndt et al. (2012b) show that, relative to other countries such as Vietnam, poor rural infrastructure in Mozambique contributes to much lower agricultural income multipliers. Ensuring a network of high-quality all-weather roads that connects all towns in Mozambique, as well as expansion of rural feeder roads, requires sustained political commitment over the long-term.

A third issue is policy distortions that limit demand for domestic labour. A first example of this is the real exchange rate. A recent analysis associated with the IMF suggests that the Metical was overvalued by between 26 and 41 per cent in real effective terms (Vitek 2009), and this preceded a phase of significant devaluation of the South African Rand relative to the Metical. While a strong metical may be 'good' for urban consumers in the South, who rely largely on food imports from South Africa, there are potentially damaging longer-term consequences for the rural sector and job creation in labour-intensive exports. Research into price competitiveness suggest that certain cash crops, such as cotton and soya, could be seriously affected by any further sustained appreciation of the currency (Salinger and Ennis 2014). The point is that maintenance of a reasonable and stable level of external price competitiveness provides a broad-based incentive to exporting activities and use of domestic factors of production. Determined pursuit of such competitiveness is necessary given Mozambique's current resource boom and high levels of external financial inflows.

Another distortion is minimum wage policies. Unlike many other countries, national minimum wages are set for individual occupational sectors in Mozambique each year. Not only do these minimum wages differ by a large factor between sectors, it is clear they have increased much more rapidly than labour productivity growth. Figure 7 plots the evolution of the cross-sector median minimum wage (unweighted) stated in USD at constant 2009 prices. This reveals that minimum wages have increased by a factor of nearly four since 1996—i.e., from 28 to 138 USD; over the period 2009-14, they increased at an annual rate of more than 10 per cent. This compares to average aggregate labour productivity growth of less than 5 per cent.

These trends are problematic for a number of reasons. First, high minimum wages constitute a bias toward certain types of labour—namely, skilled urban workers. This bias also appears to be material. Rand and Tarp (2013) note that labour productivity in the majority of Mozambican manufacturing firms is well below that implied by the minimum wage. Second, as a national price these minimum wages ignore the large regional differences in prices (as well as urban-rural differences). As discussed extensively by Arndt et al. (2015b), significant spatial price disparities are found in Mozambique due to high transport costs, reflecting long distances between centres of production and consumption, and weakly competitive intermediaries. The extent to which minimum wage policies directly affect job creation (e.g., in manufacturing) is hard to assess and merits additional research. Nonetheless, it is representative of a more general policy stance that tends to promote a structure of growth that has weak capacity to reduce absolute poverty. We recommend careful consideration of this and other policies and subsequent action in practice.

5   Conclusion

This paper has reviewed recent macroeconomic and microeconomics development trends in Mozambique. The overall aim was to make sense of the apparent disconnect between rapid aggregate growth and weaker trends in poverty reduction. While part of this disconnect reflects temporary factors, such as a conjunction of price shocks and climate events in 2008/09, more worrisome is a lack of growth-enhancing structural change in the economy. This motivated a detailed decomposition of trends in labour productivity for the period 1996-2014. This represented the primary analytical contribution of the study and was able to take advantage of recent household data from 2014.

Four main findings emerged from the labour productivity decomposition. First, labour reallocation effects have made a relatively small contribution to productivity growth over this period. Moreover, when the full post-war period is split into phases of around six years, labour reallocation was found to have made the largest relative contribution, at around 32 per cent, in the immediate reconstruction period (1997-2002). Second, the composition of labour reallocation effects has altered over time. More recently, dynamic structural reallocation effects have become negative, reflecting the point that sectors with the fastest rates of growth in employment (primarily, services) show falling levels of relative productivity. Third, within-sector productivity growth remains a predominant overall contributor to productivity growth, yet is highly uneven across sectors. We also found that, with the exception of mining, sector-specific 'intra' productivity growth has been falling over time and even negative in services and manufacturing. This implies that each worker is becoming less productive in these sectors than before, raising concerns regarding the sustainability of Mozambique's current growth path. Fourth, aggregate productivity growth appears to be increasingly dependent on the services sector. Despite large investments in mining and related industries, and associated within-sector productivity growth, this has not translated into large aggregate labour productivity benefits due to the weak contribution (negative) of these new activities to employment.

The final section of the paper reflected on what these findings mean for policy. We highlighted unavoidable demographic trends that suggest both forthcoming opportunities and challenges, particularly concerning the sheer number of new workers that will enter the labour market, and that average worker quality (years of schooling) will only evolve slowly. We suggested that macro-structural policies should be a primary though not exclusive focus of initiatives compared to sector- or firm-specific interventions. This reflects both the scale of the jobs challenge and weak state capacity to intervene at the microeconomic level. Three specific macro-structural interventions were recommended. The first is efforts to raise agricultural productivity, particularly by establishing larger and more stable incentives for the private sector to engage directly with rural smallholders. Second, investments in rural infrastructure and rural-urban connections will be critically important to exploit gains from trade and specialization. Third, we recommend efforts to minimize distortions that act against export-oriented and labour-intensive activities. Distortions that merit specific attention are external price competitiveness (via the exchange rate) and minimum wage policies.

We have argued that Mozambique's economic development challenges remain significant. However, it is important to emphasize that substantial and laudable progress has been made in sustaining two decades of rapid growth and establishing a stable macroeconomic and political environment. Moreover, part of the challenges Mozambique faces reflect the cumulative impact of historical experiences, as well as global interest in sub-Saharan African commodities. Nevertheless, Mozambique must push back against trends that favour a capital-intensive path of development. Instead, we believe greater priority must be given to finding a more labour-intensive, and thus pro-poor, growth path in which rural producers play a prominent role.

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Tables

Table 1: Trends in selected macroeconomic indicators, 5 year averages (1990-2013)

	'90-94	'95-99	'00-04	'05-09	'10-13	Change
GDP per capita (constant 2005 USD)	185.6	212.3	268.1	337.2	404.9	219.4
GDP per capita, PPP (constant 2011 internat. $)	458.3	524.4	662.1	832.7	1000.0	541.7
Inflation, consumer prices (annual %)	46.2	22.9	12.9	8.4	7.5	-38.7
FDI inflows (% of GDP)	1.1	3.9	5.9	4.5	30.1	29.0
Gross domestic savings (% of GDP)	-10.2	4.4	8.1	6.7	8.7	18.9
Exports of goods and services (% of GDP)	11.7	13.8	25.4	31.8	29.6	17.9
Imports of goods and services (% of GDP)	42.0	30.7	42.7	41.7	40.4	-1.6
Government consumption expend. (% of GDP)	11.9	7.5	9.7	14.8	19.5	7.7
Net ODA received (% of GNI)	57.7	30.1	29.9	21.1	16.2	-41.6

Source: Authors' calculations using WDI series.

Table 2: Trends in selected microeconomic indicators

(a)	DHS surveys	Group	1997	2003	2011	Change p.a. 1997-03	2003-11
	No education	Male	26.2	25.4	19.3	-0.1	-0.8
		Female	47.4	44.4	32.8	-0.5	-1.5
	Infant mortality	Boys	153	127	75	-4.3	-6.5
		Girls	142	120	67	-3.7	-6.6
	Under 5 mortality	Boys	225	181	113	-7.3	-8.5
		Girls	213	176	103	-6.2	-9.1
	Total fertility rate	-	5.2	5.5	5.9	0.1	0.1

(b)	Budget surveys	Group	1996/97	2002/03	2008/09	Change p.a. 1997-03	2003-09
	Consumption poor	-	69.4	54.1	54.7	-2.6	0.1
	Asset poor	-	73.8	73.6	66.7	0.0	-1.2
	Asset & cons. poor	-	54.0	42.6	40.1	-1.9	-0.4
	Neither (non-poor)	-	11.8	14.8	19.0	0.5	0.7

Note: 'No education' and budget survey (poverty) figures all refer to population shares; mortality figures are per 1000 children; fertility rate is expected number of births per adult woman. Changes are calculated on a mean annual basis.

Source: Authors' calculations using DHS and household budget surveys.

Table 3: Insights from Afrobarometer surveys, by region

	Urban			Rural		
	2002	2008	2012	2002	2008	2012
(a) Fairly or very good living conditions now (%)						
South	23.2	27.2	18.8	26.8	28.4	26.2
Center	40.1	18.8	24.7	45.4	24.5	25.8
North	35.1	23.2	29.9	51.7	35.3	24.7
All	31.6	23.6	23.7	44.3	28.9	25.5
(b) Better or much better living conditions now vs 12 months ago (%)						
South	32.3	40.1	47.0	15.3	43.2	36.7
Center	38.3	39.9	28.8	47.0	42.3	30.9
North	34.4	47.8	46.0	48.2	41.8	31.8
All	34.8	42.1	41.4	42.0	42.3	32.2
(c) Often or always without a cash income (%)						
South	25.5	28.0	33.3	66.7	53.0	55.4
Center	23.6	27.4	36.8	53.4	35.7	48.7
North	46.7	32.9	36.9	37.2	50.1	60.4
All	30.3	29.1	35.4	49.5	43.5	54.1
(d) Has a job that pays a cash income (%)						
South	57.1	43.1	53.0	42.4	26.2	36.3
Center	51.8	36.7	51.0	35.1	42.1	38.7
North	30.1	21.9	39.2	28.5	18.7	26.7
All	48.9	34.8	48.2	34.2	31.3	33.8

Source: Authors' calculations using Afrobarometer surveys, Mozambique.

Table 4: Decomposition of contributions to aggregate productivity growth, by period

		Absolute				Relative			
		Intra	SRE	DRE	Total	Intra	SRE	DRE	Total
1997-'02	Agriculture	1.40	-0.29	-0.01	1.10	22.2	-4.5	-0.2	17.5
	Manufacturing	0.06	1.94	-0.01	2.00	1.0	30.8	-0.2	31.6
	Mining	0.67	0.06	0.01	0.73	10.5	0.9	0.2	11.6
	Services	2.15	0.32	0.01	2.48	34.0	5.1	0.2	39.3
	Total	4.28	2.04	0.00	6.32	67.7	32.2	0.0	100.0
2003-'08	Agriculture	1.15	-0.08	0.00	1.06	27.6	-2.0	-0.1	25.5
	Manufacturing	2.04	-1.44	-0.21	0.39	48.9	-34.5	-5.0	9.5
	Mining	0.66	-0.07	-0.01	0.58	15.8	-1.7	-0.2	13.8
	Services	0.19	1.94	0.00	2.13	4.5	46.6	0.1	51.2
	Total	4.04	0.35	-0.22	4.17	96.8	8.4	-5.2	100.0
2009-'14	Agriculture	1.02	-0.44	-0.02	0.56	24.2	-10.5	-0.4	13.3
	Manufacturing	-0.20	0.49	-0.08	0.20	-4.8	11.6	-1.9	4.8
	Mining	2.97	-1.57	-0.69	0.71	70.5	-37.3	-16.4	16.8
	Services	-0.39	3.16	-0.03	2.74	-9.2	75.0	-0.7	65.1
	Total	3.40	1.64	-0.82	4.21	80.6	38.9	-19.5	100.0

Notes: Intra is the within-sector productivity effect; SRE and DRE are static and dynamic reallocation effects (respectively).

Source: Authors' calculations.

Table 5: Decomposition of contributions to aggregate productivity growth, by period

Year		Working-age population (millions)			Median forecast	
		Total	Completed primary	Not completed primary	Years of schooling	% Completed primary
2010	Male	6.0	1.8	4.2	4.9	29.8
	Female	6.6	1.2	5.5	2.9	17.5
2030	Male	11.2	4.1	7.1	6.1	36.5
	Female	11.7	3.3	8.4	4.7	28.5
2050	Male	17.7	7.6	10.1	7.1	42.9
	Female	18.1	6.8	11.3	6.2	37.5
2010		12.6	3.0	9.7	3.9	23.4
2030	All	22.9	7.4	15.4	5.4	32.4
2050		35.8	14.4	21.4	6.6	40.1

Note: Human capital forecasts are projections at the median growth path.

Source: Authors' calculations using UN baseline demographic projections, and human capital growth estimates based on data from Barro and Lee (2013).

Figures

Figure 1: Trends in per capita food availability (calories / day)
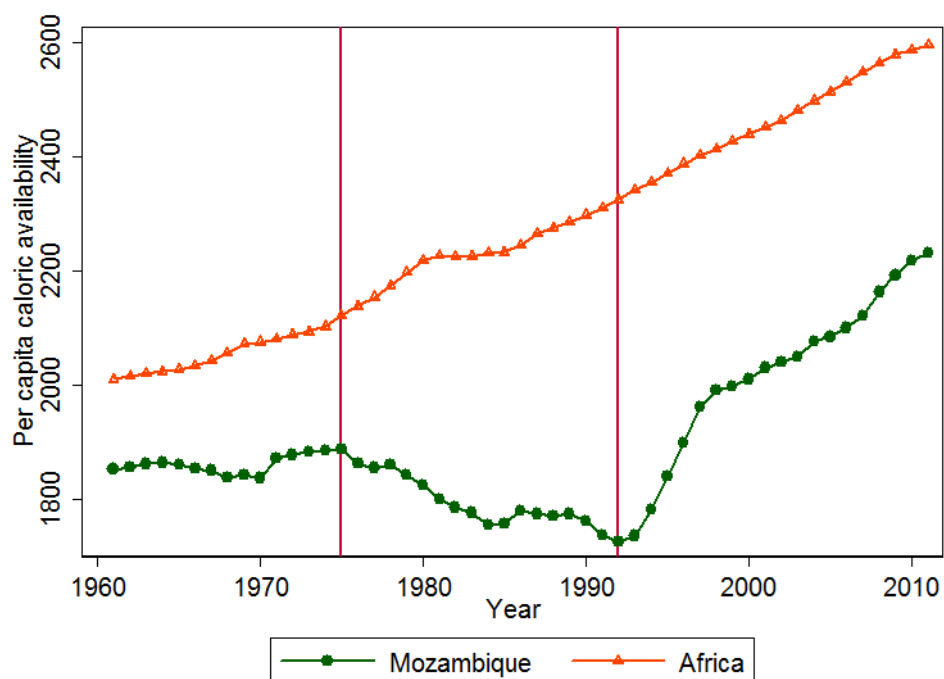
Source: Authors' calculations using FAO, food balance series.

Figure 2: Trends in real GDP per capita (2005 USD)
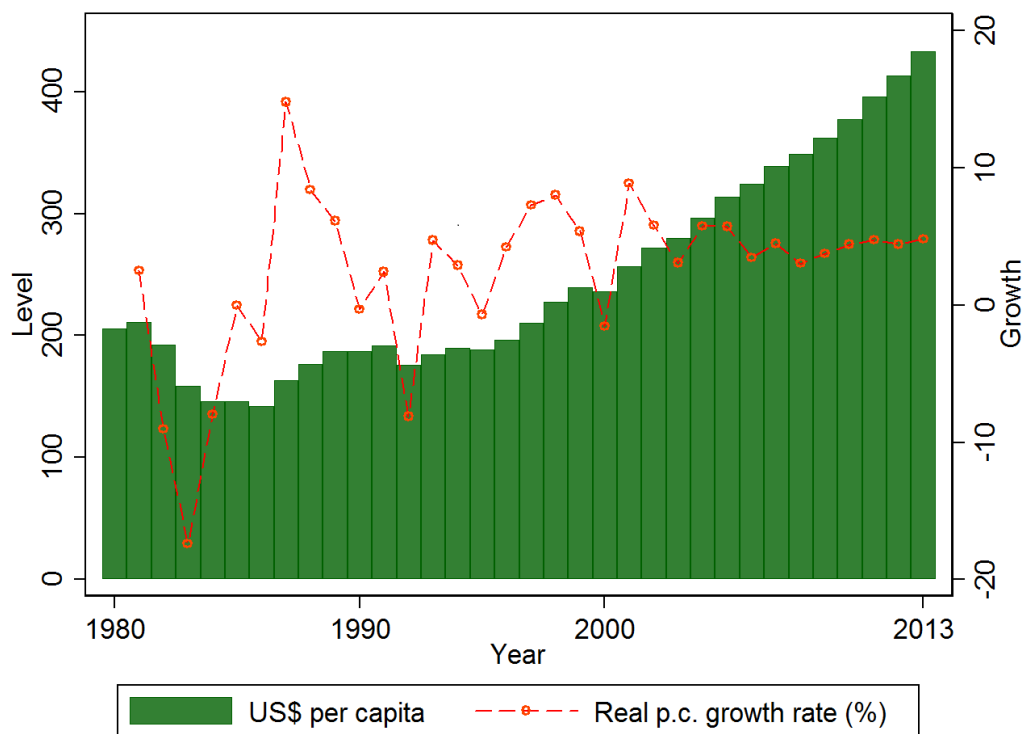
Source: Authors' calculations using World Bank, WDI series.

Figure 3: Trends in sectoral shares of real GDP (1996-2014)
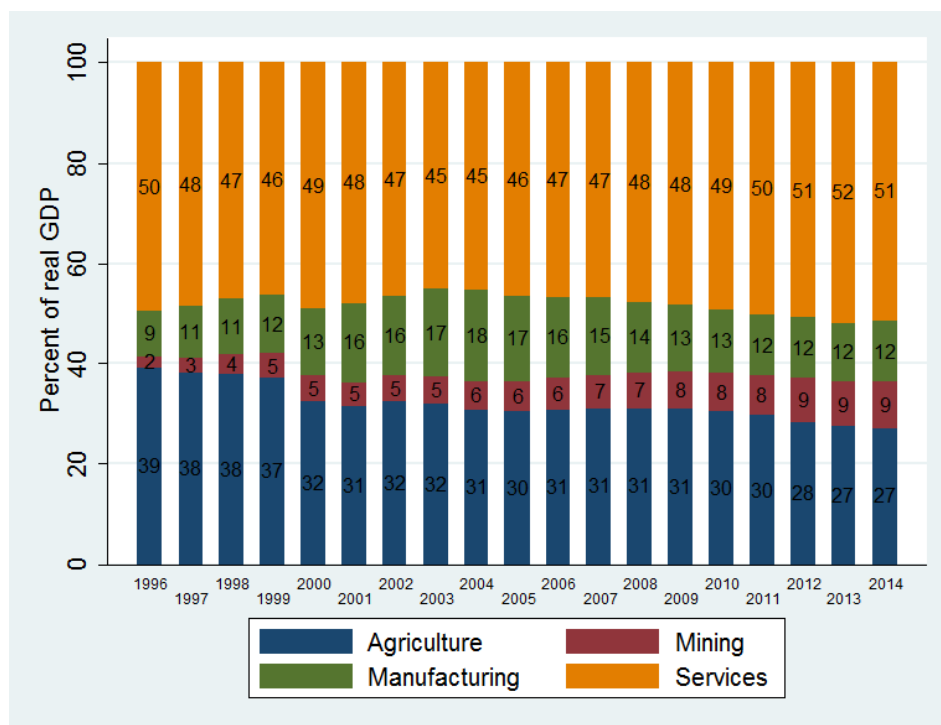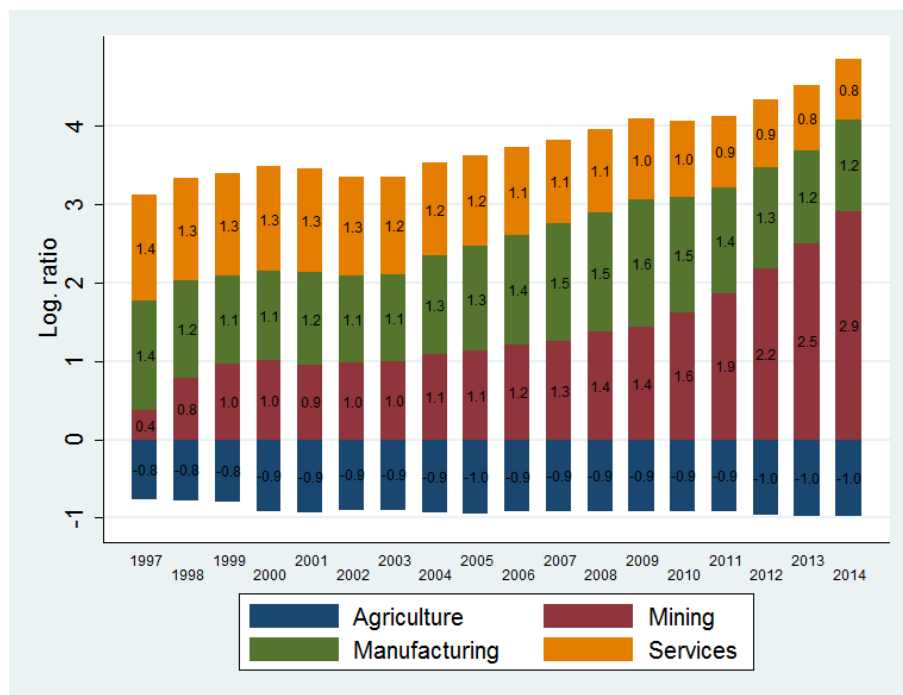

Source: Authors' calculations using Mozambican official statistics.

Figure 4: Trends in sectoral shares of employment (1996-2014)
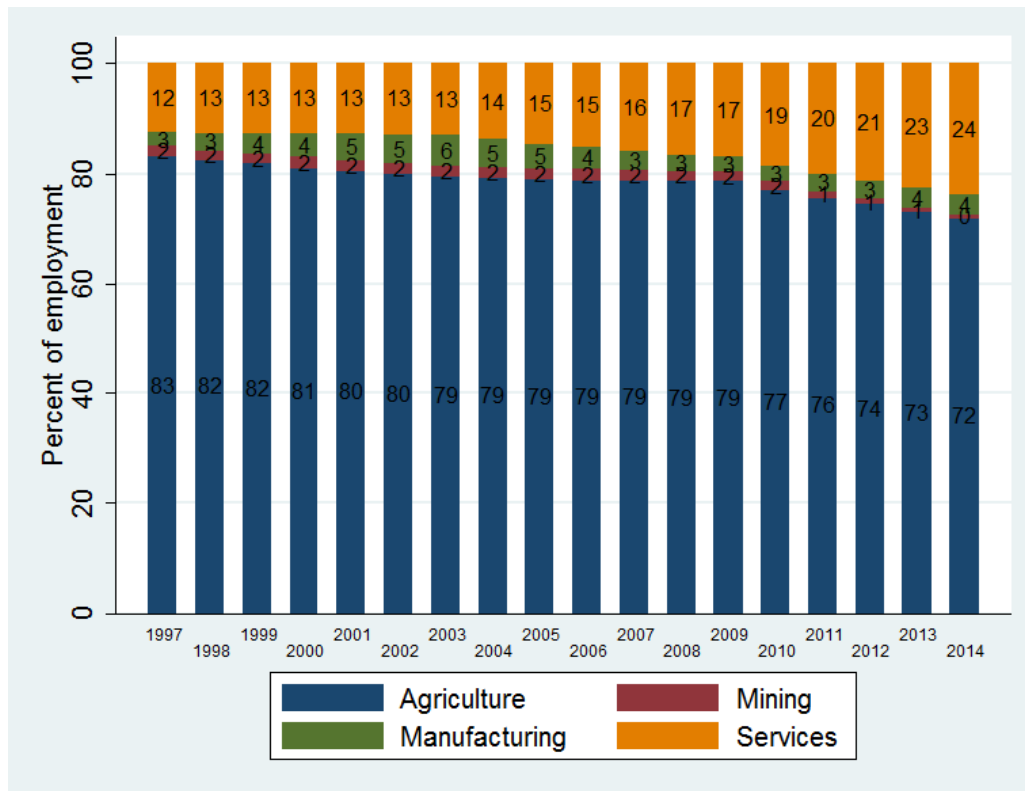
Source: Authors' calculations using Mozambican official statistics.

Figure 5: Log ratio of sector-specific and aggregate labour productivity

Source: Authors' calculations using Mozambican official statistics.

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Figure 6: Relative labour productivity vs. changes in labour shares, by sector (1997-2005 and 2006-2014)
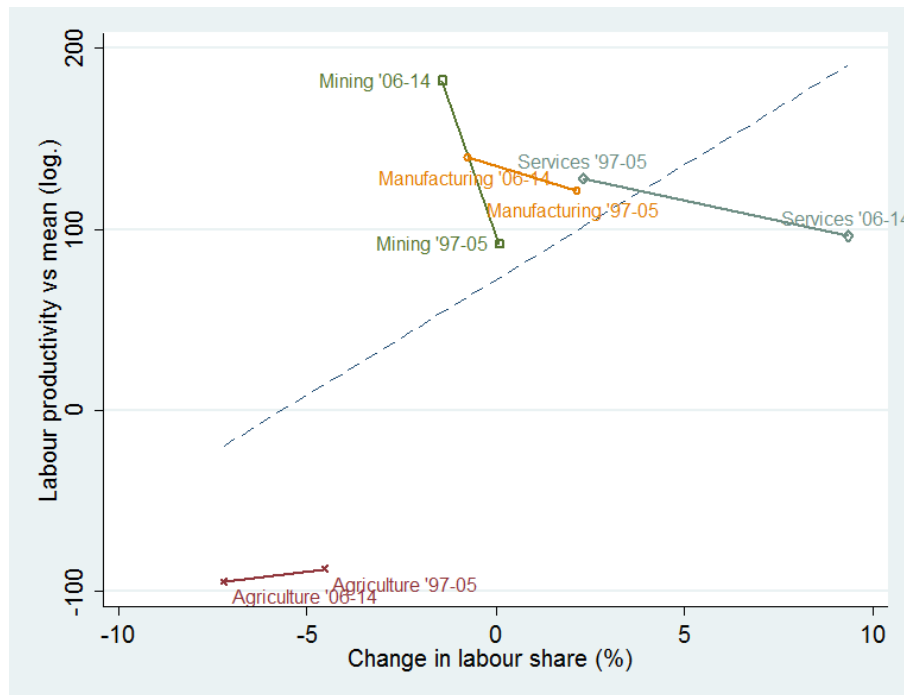
Note: Labour productivity (*y*-axis) is given by the period mean of: $100 \times \ln(\omega_{it}^P)$.
Source: Authors' calculations using Mozambican official statistics.
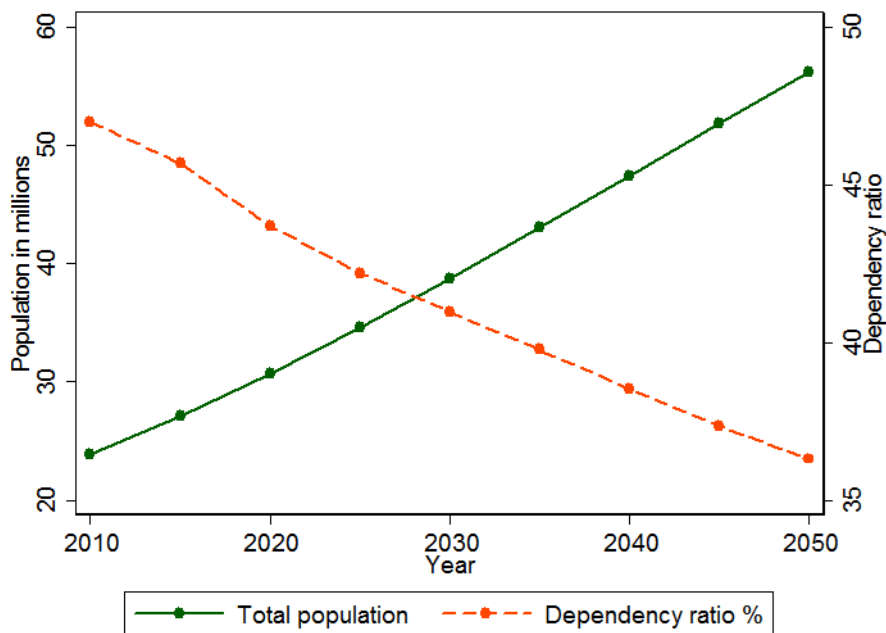
Figure 7: Trends in real minimum wages
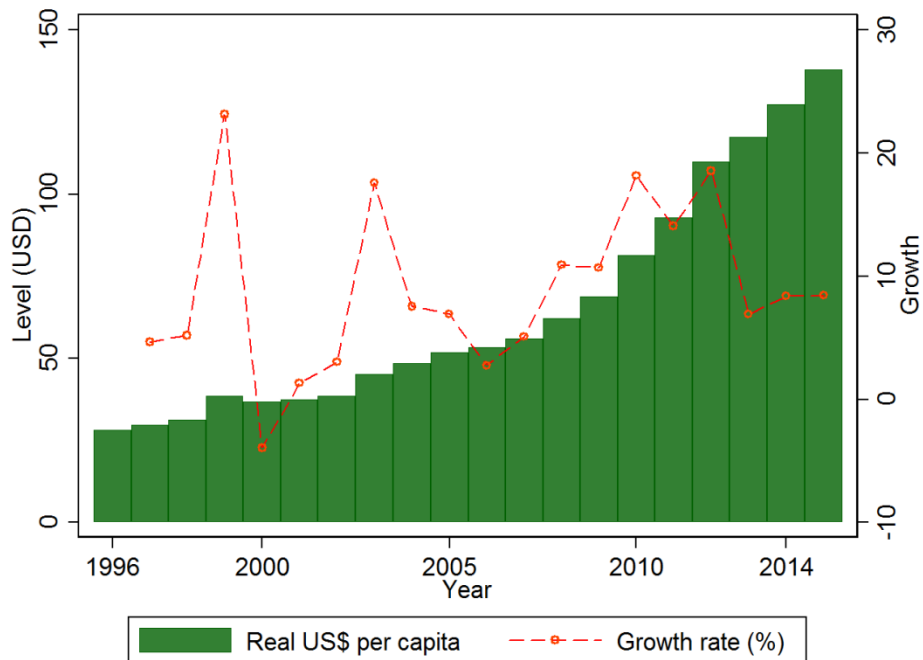
Note: Levels and growth rates refer to USD evaluated at 2009 prices (and exchange rates); estimates are medians of multi-sector minimum wages.

Source: Authors' calculations using Mozambican official statistics.
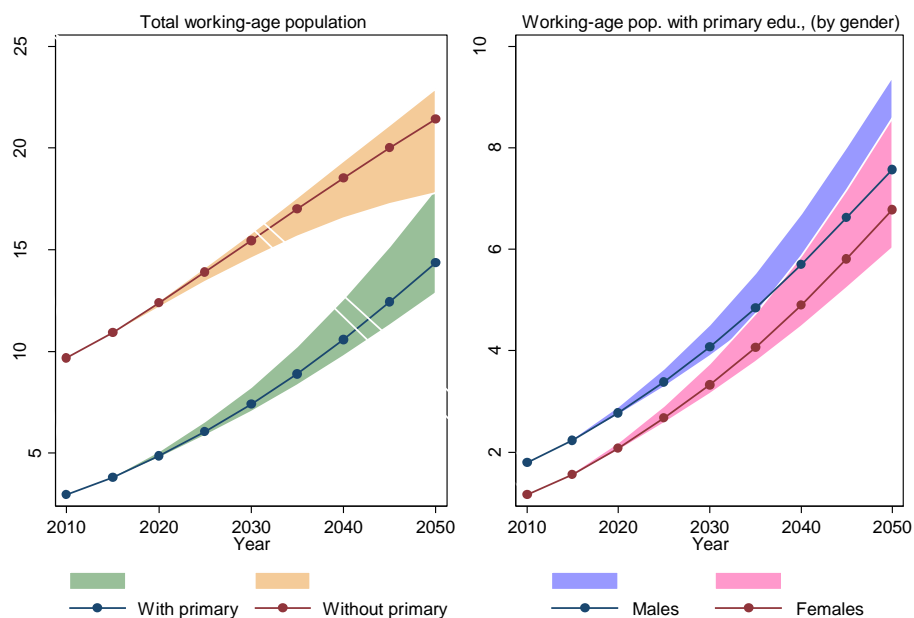
Figure 8: Total population projections, including dependency rate

Note: Dependency ratio is defined as the share of the total population that is under 15 years of age and over 64 years of age.
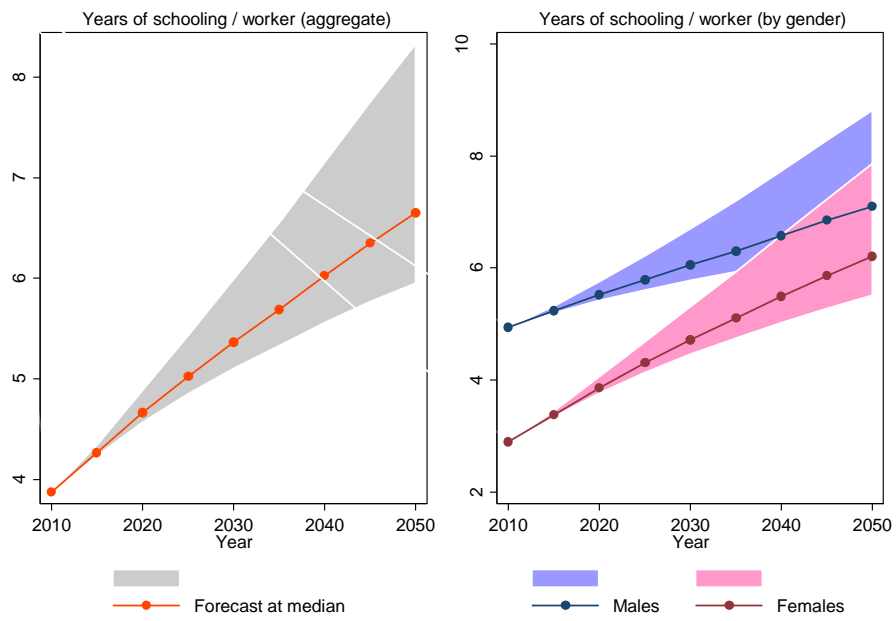
Source: Authors' calculations using UN baseline demographic projections.

Figure 9: Trends in working population and labour force quality (millions)

Note: Shaded regions represent confidence intervals defined as the 25th and 75th percentile conditional growth paths; solid lines are the projections at the median growth path (see text); all population figures are in millions.
Source: Authors' calculations using UN baseline demographic projections and human capital growth estimates based on data from Barro and Lee (2013).

Figure 10: Trends in mean years of schooling or working-age population

Note: Shaded regions represent confidence intervals defined as the 25th and 75th percentile conditional growth paths; solid lines are the projections at the median growth path (see text).

Source: Authors' calculations using UN baseline demographic projections and human capital growth estimates based on data from Barro and Lee (2013).