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**Structural change, employment and education in
Mozambique**

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Employment and
Labour Market
Policies Branch

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Preface

The primary goal of the ILO is to contribute, with member States, to achieve full and productive employment and decent work for all, including women and young people, a goal embedded in the ILO Declaration 2008 on *Social Justice for a Fair Globalization*,¹ and which has now been widely adopted by the international community.

The comprehensive and integrated perspective to achieve this goal are embedded in the Employment Policy Convention, 1964 (No. 122), in the Global Employment Agenda (2003) and, in response to the 2008 global economic crisis, in the Global Jobs Pact (2009) and in the Conclusions of the recurrent discussion on Employment (2010).

The Employment Policy Department (EMPLOYMENT) is fully engaged in global advocacy and in supporting countries placing more and better jobs at the centre of economic and social policies and of inclusive growth and development strategies.

Policy research, knowledge generation and dissemination are an essential component of the Employment Policy Department's action. The publications include books, monographs, working papers, country policy reviews and policy briefs.²

The *Employment Policy Working Papers* series is designed to disseminate the main findings of research initiatives on a broad range of topics undertaken by the various branches, units and teams in the Department. The working papers are intended to encourage exchange of ideas and to stimulate debate. The views expressed are the responsibility of the author(s) and do not necessarily represent those of the ILO.

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¹ See http://www.ilo.org/public/english/bureau/dgo/download/dg_announce_en.pdf

² See <http://www.ilo.org/employment>.

Foreword

Mozambique has been one of the fastest growing economies in sub-Saharan Africa in recent decades. However, as found in other countries, even an impressive record in term of growth does not automatically translate into less poverty and more benefits for the poor. Recent studies show that the poverty rate in Mozambique has barely changed and that growth is insufficiently inclusive relative to other successful countries. Income inequalities increased in particular between regions and social tensions have been rising confirming that growth is only one aspect of economic development and that much depends on the nature and pattern of growth..

Employment creation has proven to be one of the most effective means to redistribute the benefits of growth and reduce poverty. Yet, the heavy reliance of the Mozambican economy on extractive industries means that the country's high economic growth rate is largely driven by capital-intensive 'mega-projects' which do not create sufficient jobs directly. Direct and indirect employment impacts of mega-projects are also limited in the context of a mainly unskilled Mozambican labor force. Finally, given the salience of extractive industries, the incentives for the development of labour-intensive sectors have been limited, and the employment creation minimal.

Mozambique faces a number of acute employment challenges. There are high levels of unemployment amongst urban youth. However, unemployment is only the tip of an iceberg of underemployment, low productivity and low quality jobs. The generation of quality jobs is largely insufficient to absorb the growing supply of labor, while education and training provision remain highly inadequate and of low quality. Given the limited number of employment opportunities in the formal sector, many of the new entrants into the labour market are forced into marginal jobs in the informal economy in urban areas and in subsistence agriculture activities in rural areas, with little prospect of decent employment. The widespread poverty is exacerbated by limited social protection coverage.

The priority for Mozambique is to ensure that economic growth is robust and inclusive. The principal policy challenge is to ensure that the growth links to the national economy and the benefits for Mozambicans are substantial and that decent jobs are created throughout the economy in particular for young women and men in urban areas as well as in lagging regions. More efforts will have to be made to increase economic activity and productive and decent jobs in rural areas, given that the majority of the work-force live in rural areas and given that young men and women have a high propensity to migrate to overcrowded urban areas in search of jobs

It is against such a background that the Government of Mozambique decided to organize a High Level Employment Forum (27-28 March 2014) to promote a national dialogue on how to address employment challenges in Mozambique and contribute to the identification of elements for a national vision on employment.

A series of studies have been launched in this context and have been widely discussed during the Forum. The present study demonstrates that strong economic performance has not resulted in improved labour market outcomes in Mozambique. It is argued that economic policies are needed to support structural transformation and the creation of decent work opportunities, which in particular should focus on raising the education and skills profile of workers. The analysis is based on empirical data from three nationally representative labour force surveys in Mozambique, conducted in 2002, 2004 and 2008. It provides a series of key recommendations that will serve as inputs into the on-going national employment policy formulation process.

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Introduction

Over the past 20 years, Mozambique has boasted one of the world's highest rates of GDP growth and has successfully moved from post-conflict stabilization and reconstruction into a more mature developmental phase. However, it has also been recognized that the country's growth has become less pro-poor over time, meaning that consumption poverty rates have remained persistently high (Jones and Tarp, 2012). The employment challenges in the country range from high unemployment rates to diverse forms of under-employment and low quality employment due to the lack of skilled labour.

A key determinant of the extent to which macroeconomic growth produces gains in social welfare is the quality of the jobs that the economy generates. One could expect that structural change towards higher value added sectors and upgrading of technologies in existing sectors would allow better conditions of work, better jobs, and higher wages. Education and skills are intrinsically linked to these processes, as sectors applying more complex production technologies and research and development activities increase demand for education and skills. Education and skills training in themselves, however, do not create decent jobs, and an increase in educational attainment levels may also result in graduate unemployment or under-utilization of skills. It is not uncommon to find high rates of unemployment among the better educated in developing countries (ILO, 2013a).

In the light of the above, the current study explores the link between economic structural transformation and employment on the one hand, and the change in educational attainment on the other. It aims at a better understanding of how different patterns of structural transformation in the economy and changes in educational intensity and skills profiles of jobs in Mozambique are related to productivity and quality of jobs created. The study is based on empirical data from three nationally representative labour force surveys in Mozambique conducted in 2002, 2004 and 2008 (see Annex D). It summarizes recent macro-economic indicators and provides a micro-economic analysis of labour market outcomes and returns to education. Additional insights regarding the role of education and structural change are gained from an analysis of changes in the occupational and sectoral distributions of employment.

The study is structured as follows. Section 1 provides an overview of education, training policies and enrolment rates in Mozambique. Section 2 discusses economic growth, employment and productivity by broad economic sector. Section 3 contains an analysis of the education profile of the labour force, and education intensity and structural changes are discussed in Section 4. Results of three different methods for calculating qualification mismatch are presented and discussed in Section 5. This section further analyses factors related to qualification mismatch and provides estimates of the impact of the qualification mismatch on individual earnings. Section 6 provides estimates of returns to education in Mozambique, including disaggregations by main economic sector. Finally, Section 7 summarizes the main findings of the study.

1 Overview of education, training policies and enrolment rates in Mozambique

Mozambique remains one of the poorest countries in the world. The Human Development Index value for 2012 is 0.327, positioning the country at 185 out of 187 countries (UNDP, 2013). The country also ranks 21st out of 28 Sub-Saharan African countries on the Education for All (EFA) development index, and has one of the highest illiteracy rates in the world (UNESCO, 2012). Mozambique's third Poverty Reduction Strategy Paper (Republic of Mozambique, 2011) adopts inclusive growth as a key national priority and recognizes that efforts to promote human and social development need to be complemented by an economic strategy that boosts productivity in labour-intensive sectors and stimulates the structural transformation of the economy. To meet the country's human development goals, expansion and improvements in the educational system are critically important elements in both the long and short-term perspectives. In the long term, universal access to education is essential for the development of Mozambique's human resources. Economic growth will depend to a significant extent on the education and skills of the labour force. In the short term, increased access and improved quality in basic education are powerful mechanisms for wealth redistribution (UNESCO, 2008).

Since its independence in 1975, the country has faced a series of education challenges, but has also made significant progress in the development of the education system. In 1982, a new National Education System was introduced, with a strong focus on the expansion of schooling, new structure, new curriculums and new textbooks. The change not only emphasized the constitutional right to education, but also introduced compulsory and universal schooling of seven years, and public access to professional, technical and teacher training (Simone, 2009). The new education system was revised in 1992 and currently includes general education, adult education, teacher training and technical vocational education. To ensure better access to education, the Government approved a policy for the establishment and operation of private schools in 1992. However, private school coverage represents only about 1.6 per cent of the total (Bartholomew et al., 2009).

In 2004-2005, an important set of reforms was enacted with a view to increasing access to education and raising completion rates. Components of the reform were closely related to a reduction in direct costs for households by abolishing national tuition and other fees in primary education, providing free textbooks and increased funding for schools at all levels.¹ A new curriculum was adopted, organized into three main phases: grades 1-2, grades 3-5 and grades 6-7 (Fox et al., 2012). The new curriculum introduced seven years of complete and integrated primary schooling, bilingual education and semi-automatic promotion (Bartholomew et al., 2009).

One of the main objectives of the Government's policy since the end of the civil war, and more recently under the Poverty Reduction Action Plan (PARPA II) 2011-2014, has been to provide quality education for all, including universal primary education, adult literacy and expansion and improvement of secondary education. As a result of donor investment,² Mozambique has reached the EFA Goal of spending 20 per cent of total budget revenue on education. Since 2002 primary education has received more than 50 per cent of the education budget, and secondary education roughly 14 per cent (World Bank, 2008b). A series of education plans have been developed. The First Education Sector Strategic Plan (ESSP) covered the period 1999-2005 and focused on three key strategic areas: access, quality and capacity building. As far as medium-term policies are concerned, the Government developed a Strategic Plan for Education and Culture (2006-2011), which

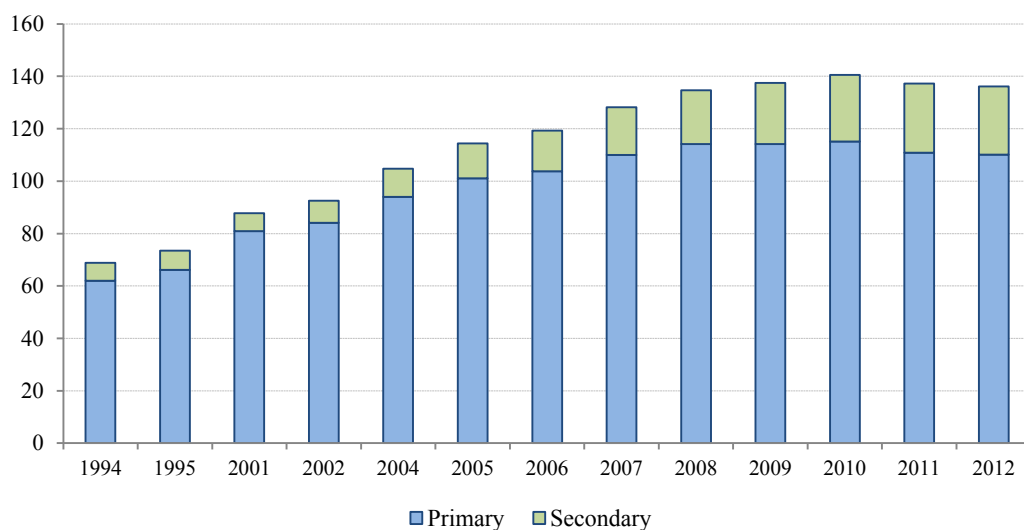
¹ Schools received additional funds through the Direct Support to School programme.

² These include multilateral banks (African Development Bank, Islamic Development Bank), and many United Nations agencies (UNDP, UNESCO, UNFPA and WFP).

was more comprehensive and covered the entire education sector.³ It sought to address rapid progress towards universal primary education by 2015 and to provide educational opportunities for out of school youth and adults. Improving the curriculum, facilities and capacity of teachers were the pillars of the strategy. It also stressed the need to put greater emphasis on the training dimension of education, building new schools and improving the infrastructure for secondary and technical-professional education and giving priority to disadvantaged children, children with special needs and girls. More recent policies have further emphasized improving the efficiency and management of the education system, and promoting public-private partnerships for the provision and funding of secondary education (Bartholomew et al., 2009).⁴

These reforms and, in particular, the abolition of fees in 2004, have resulted in a notable increase in enrolment rates.⁵ Between 1994 and 2012, the gross enrolment rate increased from 62 per cent to 110 per cent at primary level and from 7 per cent to 26 per cent at secondary level (Figure 1).

Figure 1: Evolution of gross enrolment rate in primary and secondary education (%)



Source: UNESCO (2013).

Correspondingly, the net enrolment rate at primary level has increased continuously.⁶ In 2008, 81 per cent of children aged 6-12 were enrolled in school (Republic of Mozambique, 2010). Following the expansion in school enrolment, the number of teachers in lower primary education increased substantially, by 36 per cent from 1980 to 1990, by 52 per cent from 1990 to 2000 and by 52 per cent from 2000 to 2009. More children have completed primary school and repetition rates have been falling. The primary education

³ The strategy incorporated reforms proposed by Education for All, Fast Track Initiative (EFA-FTI), which is an evolving partnership of developing countries and donor agencies. Its main objective is accelerating progress towards the EFA goal of universal primary school completion for boys and girls alike by 2015.

⁴ More specific strategies currently in place are the Education Strategic Plan 2012-2016; General Secondary Education Strategy 2009-2015; Technical-Professional Education Strategy 2002-2011; Teacher Training Strategy 2004-2015; Strategic Plan for Higher Education 2000-2015; and Employment and Professional Training Strategy 2006-2015.

⁵ The Ministry of Education and Culture decided to abolish school fees for grades 1-7 in 2003, with effect from the 2004 school year.

⁶ The gross enrolment rate is defined as the total number of students enrolled at a particular level of education, regardless of their age, as a percentage of the population in the age group associated with that level; the net enrolment rate is defined as total number of students enrolled at a particular level of schooling who are of the age associated with that level of schooling, divided by all persons of the age associated with that level of schooling.

completion rate was 59 per cent in 2008, a significant improvement over 2001 when it was only 19 per cent. Until 2001 the number of repeaters at primary levels was 23 per cent, which fell to 5 per cent in 2008. In addition to the abolition of school fees, the introduction of semi-automatic promotion at primary level (pupils can only be made to repeat if they fail in examinations at grades 2, 5 or 7) had a major bearing on primary school completion. The policy of semi-automatic promotion was explicitly devised as part of the comprehensive reform of the primary school curriculum (Bartholomew et al., 2009).

Overall, the increase in the number of schools, teachers and enrolment rates since 1992 has contributed towards a reduction in illiteracy rates among younger individuals. However, the aggregate data for enrolments and completion presented above hide two fundamental issues of equity. These are, firstly, the differences between males and females, and secondly, the substantial regional disparities, both of which are closely related to poverty. Adult illiteracy rates among women were far higher than among men (70 per cent and 49 per cent, respectively, 2002-2006, Annex A, Table A1). The high illiteracy rates in Mozambique have not only been a result of a poor early schooling. They have also been a consequence of a lack of federal investment, since the importance of adult education was only recognized after independence when nationwide adult literacy and education campaigns were launched (UNESCO, 2012). In 2009, the Government approved the Public Administration Gender Strategy (2009-2013) focusing on gender equality and in particular gender parity in primary education and promotion of access of girls to education and to technical and vocational professional training.⁷

Although primary education has been the highest priority for the Government, it cannot be viewed in isolation from other parts of the system. Secondary level education has been recognized as another key priority of current education policies. In general, access to secondary education is very limited and secondary school completion rates remain very low, at only 13 per cent (AfDB, 2011). In addition, the current curriculum, which is highly encyclopaedic and academic, has been found to be irresponsible to the needs of the labour market. Technical and vocational education and training, which is an essential element of secondary education, has also been ineffective. The training programmes for secondary education are excessively long and expensive and in many cases poorly related to the practical realities of secondary education classrooms.⁸

Higher education experienced significant growth between 2004 and 2009, with enrolment rising from 15,113 to 60,949 in public universities and 7,143 to 20,301 in private institutions. However, overall, the higher education system has remained relatively small, with a gross enrolment rate of only 1 per cent (AfDB, 2011). The Ministry of Higher Education, Science and Technology developed a Strategic Plan for Higher Education (PEES, 2000-2010) defining the objectives, structure, financing and governance of the higher education sector (MECST, 2000). The Plan sought to reform the higher education sector by updating the law on higher education; redefining the role of government in relation to higher education; improving the internal efficiency of higher education institutions; strengthening the academic and administrative capacity of the staff; improving equal access with regard to gender, geographical location and socio-economic profile; increasing the graduation rate; and improving the quality of teaching-learning processes (Gondwe, 2011).

Parallel to reforms in the education sector in general, the Government decided to reform the technical and vocational education and training (TVET) system by proposing a long-term TVET reform programme for the period 2006-2020 (Gondwe, 2011). More recently, the Government shifted its priorities to professional and vocational training through the introduction of the Integrated Programme for Reform of Professional Education

⁷ Government of Mozambique, Gender Strategy in the Public Administration, 2009-2013.

⁸ Strategic Plan for Education and Culture, 2006-2010/11.

(PIREP). The pilot project ran between 2006 and 2011 in selected training institutions at the secondary education level, and covering selected sectors of the economy.

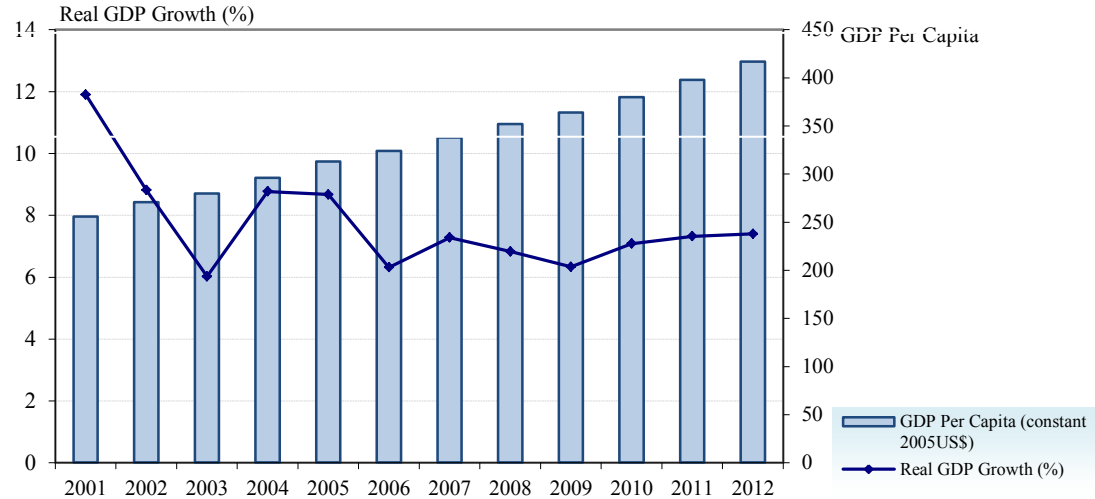
Improving the education level of the labour force requires a long-term strategy. Despite the creditable achievements in increasing enrolment, it is recognized that the education system in Mozambique is still at a crossroads. There are significant challenges to overcome in terms of completion, repetition, and dropout rates. Limited access to the upper grades of primary education, very low enrolment rates in secondary and higher education, regional differences in access to and quality of education, high pupil-teacher and class-teacher ratios are also challenges in the sector (Fox et al., 2012)(Annex A, Table A2). The number of untrained teachers in secondary schools is significant and has risen substantially. In 2005, 78 per cent of all lower secondary teachers lacked the qualifications to teach at this level (AfDB, 2011).

As the country moves ahead, the challenges, and some of the strategies are clear. There is no doubt that to achieve inclusive growth, the education system must ensure that as many children as possible start and finish primary school with competency in the basic subjects. At the same time, Mozambique needs to be well prepared for a necessary expansion of secondary education (Fox et al., 2012).

2 Economic growth, employment and productivity by broad economic sector

Mozambique has made significant progress under the combined impact of macroeconomic stability and faster economic growth. The economy has weathered the global economic and financial crises, with economic growth dipping to 6.3 per cent in 2009, but recovering to 7.2 per cent in 2011 and 7.4 per cent in 2012 (Figure 2). Strong economic growth continues to be driven mainly by foreign-financed projects, large aid inflows and investment in mineral resources, industry, services and agriculture. The progressive increase in coal production and implementation of large infrastructure projects are expected to continue to drive growth to 8.5 per cent in 2013 and 8 per cent in 2014 (AfDB, 2013). According to some estimates, Mozambique is set to become one of the biggest coal and gas producers in the world, a fact that will boost economic growth potential. Investment in the extractive industries jumped from US\$184 million in 2005 to over US\$2.5 billion in 2012. The positive economic trend is reflected in private investment flows to Mozambique, which increased significantly from US\$43 million in 2009 to US\$568 million in 2011 (Vollmer, 2013).

Figure 2: Real GDP and per capita GDP (constant 2005 US\$)



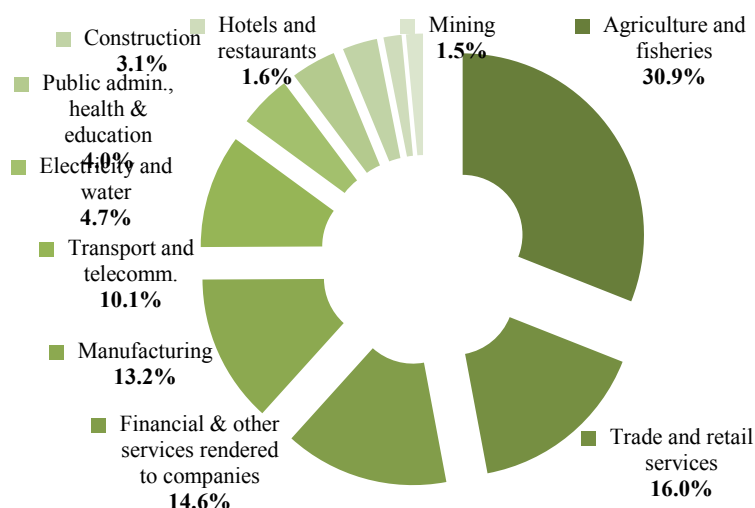
Source: WDI database.

Despite its strong and sustained economic growth record, the Mozambican economy has experienced minimal structural transformation. Its productive base depends largely on natural resources, concentrated in a few mega-projects, specifically coal, gas and aluminium. These mega-projects generate large foreign investment inflows, which have driven economic growth but have not had a significant impact on government revenues and economic diversification (AfDB, 2013).⁹ The structure of the economy remains narrowly

⁹ Several studies have examined the impact of mega projects on the economy (Castel-Branco, 2003; IMF, 2010). The focus of these efforts has been on estimating the contribution of mega projects to value added (measured at factor cost) and the rate of growth of value added, as well as the broader benefits to living standards in Mozambique. The general conclusion of these investigations is that mega projects have made a substantial contribution to GDP over the decade but their impact on living standards has been limited, mainly because they are foreign-owned investments that repatriate a large portion of their profits; they are capital-intensive operations and therefore do not employ many workers; and, finally, they rely heavily on imported intermediate inputs and thus have limited linkages with the rest of the economy (Biggs, 2012).

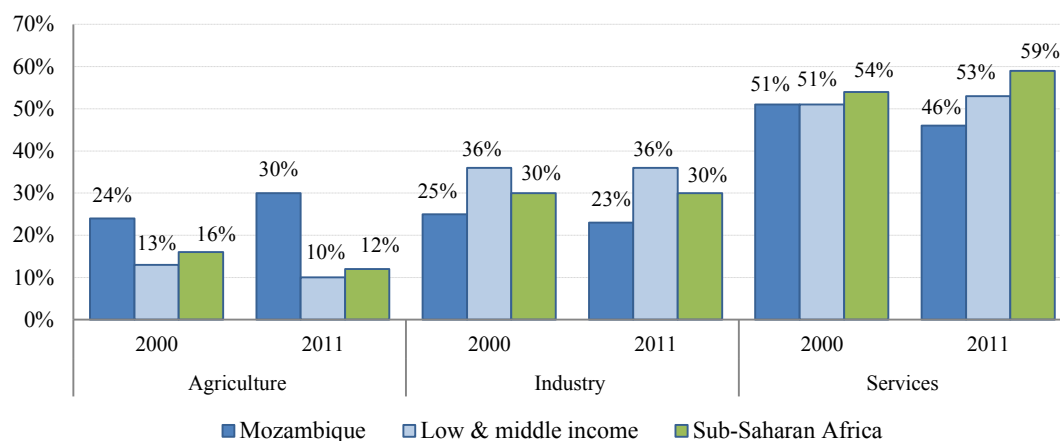
based on subsistence agriculture, which accounts for about 81 per cent of the employed (in 2008) and 31 per cent of GDP in 2010. It was followed by trade and retail services (16 per cent); financial services (14.6 per cent); manufacturing (13.2 per cent, two thirds of which was accounted for by one large aluminium smelter); transport and communications (10 per cent); and the electricity, gas and water supply sector (4.7 per cent) (Figure 3). The contribution of the services sector to GDP gradually decreased from 51 per cent in 2000 to 46 per cent in 2011, while the contribution of agriculture increased (Figure 4).

Figure 3: Breakdown of GDP by sector (2010)



Source: Banco de Moçambique, INE Moçambique, ES Research - Sectoral Research.

Figure 4: Structure of output in 2000 and 2011 (% of GDP)



Source: World Bank (2013a).

Notes: Services correspond to the International Standard Industrial Classification (ISIC) divisions 50-99 and they include value added in wholesale and retail trade (including hotels and restaurants), transport, and government, financial, professional, and personal services such as education, healthcare, and real estate services. Also included are imputed bank service charges, import duties, and any statistical differences noted by national compilers as well as discrepancies arising from rescaling.

The concentration of the economy in mega-projects is also reflected in export patterns. Exports and imports have grown significantly in the 2000s, with exports reaching some 30 per cent of GDP in 2011. However, more than half of total exports from Mozambique remain concentrated in aluminium. The country's exports are mostly directed to Europe (54 per cent) (AfDB, 2012). The contribution of capital investment to growth also gradually increased between 2004 and 2011. On the other hand, the evolution of the structure of

aggregate demand in Mozambique shows that private consumption has declined as a percentage of GDP (Table 1).

Table 1: Demand side drivers of growth (% of GDP)

	1991	2000	2004	2008	2009	2010	2011
Public consumption	9.6	9.0	10.8	12.1	13.3	13.4	14.0
Private consumption	99.0	80.6	81.4	85.5	90.3	83.3	78.1
Gross capital formation	16.2	31.0	18.6	16.5	14.9	21.8	24.7
Imports of goods and services	34.9	37.0	41.8	46.4	43.3	44.7	46.2
Exports of goods and services	10.2	16.5	30.9	32.3	24.8	26.1	29.4

Source: WDI selected years.

Analysis of growth across broad sector categories provides an in-depth insight into the key driving forces operating in the country (Table 2). More detailed disaggregation of the relative sector contributions to gross value added is provided in Annex A, Table A3. As Table 2 indicates there was considerable industrial sector growth during the late 1990s due to the start of export-oriented mega-projects. Despite fairly strong growth rates in agriculture and services, Mozambique's economic performance between 1996 and 2004, therefore, seems to have been largely determined by industry growth (manufacturing and utilities). Value added generated by industry as a share of GDP increased from 16.7 per cent to 23.3 per cent between 1992 and 2011. Within the industry sector, the share of manufacturing significantly increased during the period 1992-2004. The share of agriculture fell during the same period, mostly due to the strong expansion of industrial output, and increased over more recent years, possibly due to the impact of the global economic crises on industry and services.

Table 2: Sector performance and economic structure (1992 - 2011)

(a) Value Added (% of GDP)												
	1992	1994	1996	1998	2000	2002	2004	2006	2008	2009	2010	2011
Agriculture	34.5	33.3	35.2	30.8	24.0	27.8	26.7	27.1	28.5	29.0	29.5	30.3
Industry	16.7	15.2	16.3	22.0	24.5	23.1	26.7	25.7	23.9	23.1	23.0	23.3
<i>Manufacturing</i>	11.4	8.9	8.8	11.1	12.2	13.9	17.2	15.6	14.9	14.0	13.7	13.5
Services, etc.	48.8	51.5	48.5	47.2	51.5	49.0	46.6	47.2	47.6	47.8	47.5	46.4
(b) Value Added Growth (annual % growth)												
	1992	1994	1996	1998	2000	2002	2004	2006	2008	2009	2010	2011
Agriculture	-19.3	-1.1	8.9	7.5	-11.8	11.2	4.8	10.2	9.1	5.9	5.9	8.7
Industry	-6.8	0.9	18.5	34.7	9.2	9.8	12.3	7.1	2.0	5.1	3.7	7.6
<i>Manufacturing</i>	-7.9	-6.0	18.9	14.4	15.1	8.7	13.2	3.0	4.9	2.4	1.8	4.8
Services, etc.	5.4	11.4	4.6	6.1	7.1	5.4	8.5	9.9	6.9	7.1	7.5	7.0

Source: WDI selected years.

A key determinant of the extent to which economic growth increases social welfare is the creation of decent work opportunities. Figure 5 presents ILO estimates of the employment-to-population ratio, i.e. the proportion of the working-age population that is employed (age group 15 and older), which is benchmarked against figures for Sub-Saharan Africa and low and middle-income countries. The employment-to-population ratio (EPR) in Mozambique stood at about 79 per cent in 1991 and 2011, which was above the average for low and middle-income countries and Sub-Saharan Africa (ILO, 2013b). Such a high ratio suggests widespread low-quality employment, as opposed to opportunities for decent work (see below).

Figure 5: Employment-to-population ratio (EPR), 15+ (%)



Source: ILO (2013b).

Economic transformation can be reflected in several labour market outcomes, one of which is a movement of labour out of agriculture into non-agricultural sectors. Disaggregated employment data suggest that Mozambique's economy did not experience any significant structural transformation. As shown in Table 3, agriculture remains the dominant source of employment and the share of the workforce in this sector is persistently high (81 per cent in 2008, an increase by about 2.4 per cent since 2004). The concentration of employment in low-productivity sectors such as agriculture again indicates that many of the jobs created in the country were of low quality. Industry accounted for about 4.5 per cent and the service sector for about 14.5 per cent of employment in 2008 (5 per cent and 16.3 per cent respectively in 2004).

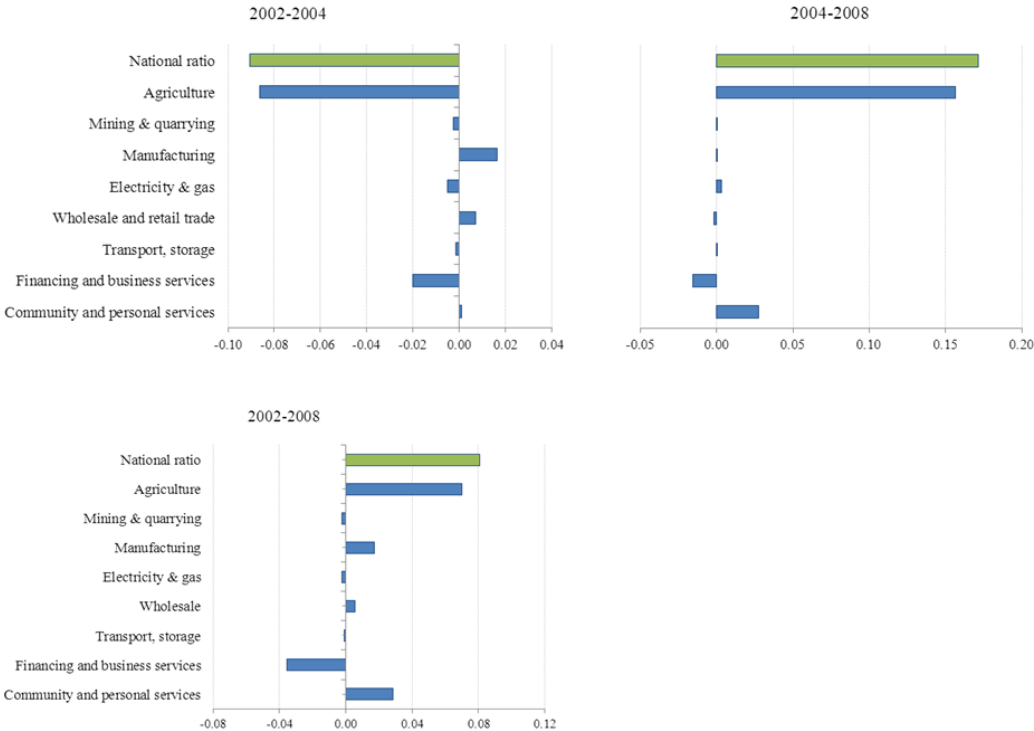
Table 3: Employment in Mozambique by sector (%)

	2002	2004	2008
Agriculture	80.5	78.7	81.1
Industry	4.4	5.0	4.5
Service	15.1	16.3	14.5
Urban			
Agriculture	47.7	41.7	46.7
Industry	8.0	12.6	11.8
Service	44.3	45.6	41.4
Rural			
Agriculture	93.0	93.3	93.8
Industry	1.6	2.0	1.7
Service	5.4	4.8	4.4

Sources: Authors' estimates from 2002/03 IAF, 2004/05 IFTRAB labour survey, and 2008/09 IOF.

Changes in the EPR from 2002 to 2008 can be attributed to changes in the share of agricultural employment, as is demonstrated by the breakdown of the contribution of each sector to the change in the EPR (Figure 6). The decline in agricultural employment accounted for most of the decline between 2002 and 2004. Manufacturing as well as wholesale and retail trade made the largest positive contribution to the change in the EPR during the same period. Both between 2004 and 2008 and during the whole period from 2002 to 2008 agriculture made the largest positive contribution to changes in the EPR.

Figure 6: Contribution of each sector to change in the employment-to-population ratio



Source: Authors' estimates from 2002/03 IAF, 2004/05 IFTRAB, and 2008/09 IOF.
 Note: See Annex C for methodological details

To assess the quality of jobs, the classification by status in employment is used, distinguishing between 'vulnerable' and 'non-vulnerable' employment. Vulnerable employment is often characterized by inadequate earnings, lack of social security and difficult conditions of work (Sparreboom, 2011).¹⁰ Household survey data indicate that vulnerable employment, calculated as the share of self-employed workers and unpaid family workers in total employment, is very high in Mozambique, at about 89.3 per cent in 2004 and 90.8 per cent in 2008. The data also indicate that the average hourly income from paid employment in Mozambique in 2008 was much higher than the income of those in vulnerable employment, which suggests that the productivity of paid employed workers is higher.

The two groups that constitute vulnerable employment show slightly different patterns in the labour market. Contributing family work as a share of employment increased by 10.6 per cent between 2004 and 2008, while self-employment showed a decline by 9.1 per cent.¹¹ In other words, the dynamics of vulnerable employment was driven by opposing movements of the constituent groups. Men and women also experience somewhat distinct trends. The increase in contributing family work was more pronounced for women, while female self-employment decreased to a larger extent than male (Table 4).

¹⁰ It should be noted that there are limitations to the use of 'non-vulnerable employment' as a proxy for decent work. Some workers in wage employment, in particular those in casual/irregular wage work, are likely to face similar decent work deficits as self-employed workers.

¹¹ It is difficult to provide a clear explanation of these patterns, as growth in both self-employment and contributing family work is likely to reflect limited paid employment opportunities. Differences in the way the 2004 and 2008 surveys were conducted may play a role, in particular the stronger focus of the 2004 survey on employment issues, but in principle the methodology of the two surveys was similar.

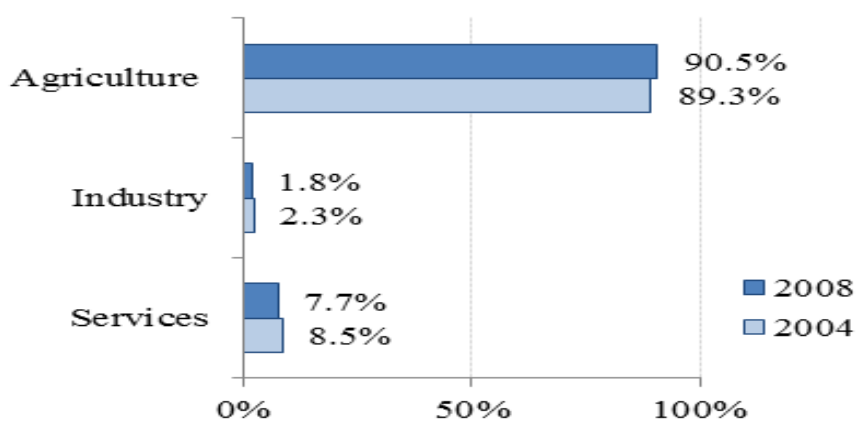
Table 4: Status in employment (%)

	2004	2008	Change 2004 to 2008 (per cent)
Employees/employers			
Both sexes	10.7	9.2	-1.5
Males	18.4	16.1	-2.3
Females	4.6	3.3	-1.2
Self-employed workers			
Both sexes	53.0	43.9	-9.1
Males	59.6	51.4	-8.1
Females	47.7	37.4	-10.3
Contributing family workers			
Both sexes	36.2	46.8	10.6
Males	22.1	32.5	10.4
Females	47.7	59.3	11.5

Source: Authors' estimates from 2004/05 IFTRAB and 2008/09 IOF.

There was little difference in the sectoral distribution of vulnerable employment over the period examined. As shown in Figure 7, the agricultural sector accounted for 89.3 per cent of vulnerable employment in 2004, increasing to 90.5 per cent in 2008. The already low shares of the broad industry and services sectors in vulnerable employment fell during this period (see Annex A, Figure A1 for more sectoral detail).

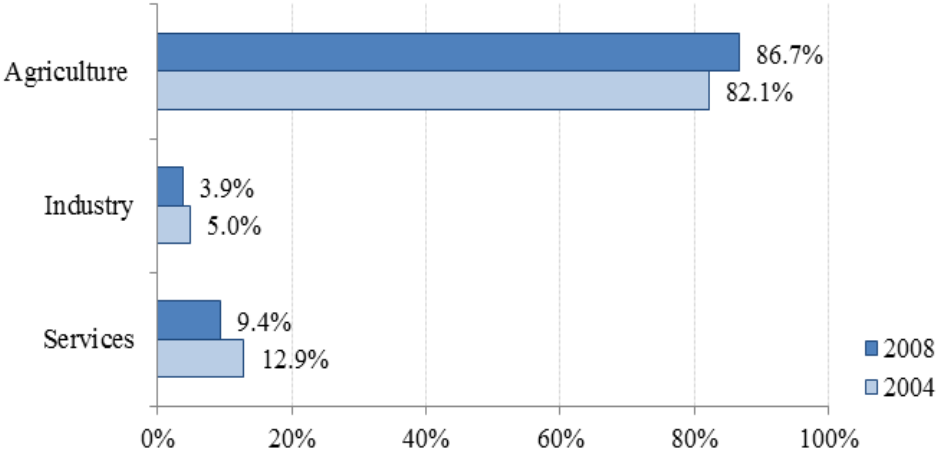
Figure 7: Sectoral distribution of vulnerable employment (%)



Source: Authors' estimates from 2004/05 IFTRAB and 2008/09 IOF.

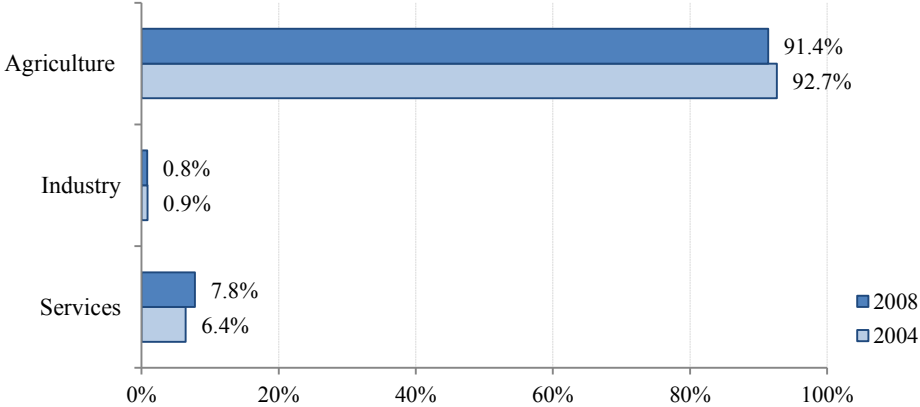
There are some differences in the dynamics of vulnerable employment across sectors and gender during the period 2004-2008. Among men, the share of the services and industry sectors in vulnerable employment declined slightly and the share of agriculture increased. In the case of female employment, the agriculture sector accounted for about 93 per cent of total vulnerable employment in 2004, decreasing to 91 per cent in 2008 (Figures 8 and 9).

Figure 8: Sectoral distribution of vulnerable employment, men (%)



Source: Authors' estimates from 2004/05 IFTRAB, and 2008/09 IOF.

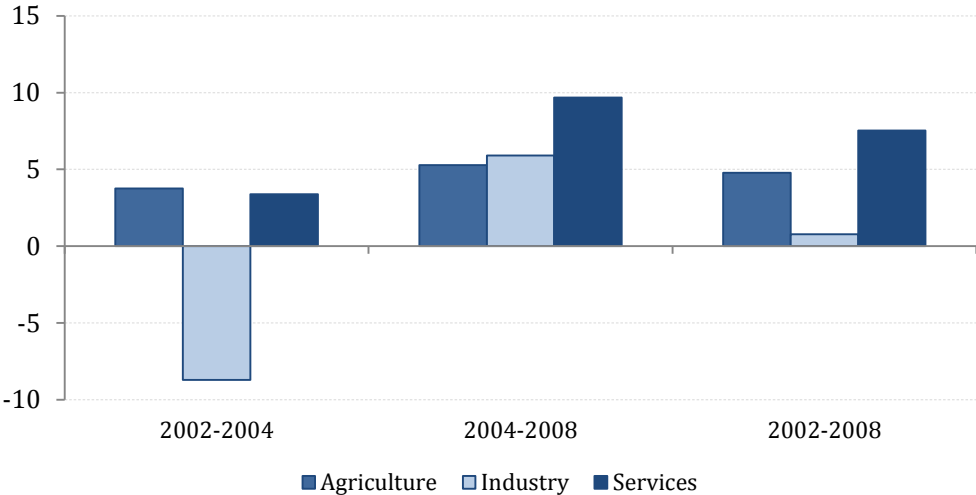
Figure 9: Sectoral distribution of vulnerable employment, women (%)



Source: Authors' estimates from 2004/05 IFTRAB, and 2008/09 IOF.

Going forward, the key challenge is not only to support structural change but also to ensure within-sector productivity gains (World Bank, 2008a). The employment outcomes outlined above and the relatively stable economic performance have been accompanied by high labour productivity growth. During the period 2002-2008, aggregate labour productivity grew at an annualized rate of 5.4 per cent. Output per worker grew particularly strongly between 2004 and 2008 in the services and industry sectors, at annualized rates of 9.7 per cent and 5.9 per cent respectively (Figure 10).

Figure 10: Productivity by broad sector in Mozambique, annualized growth rates (%)



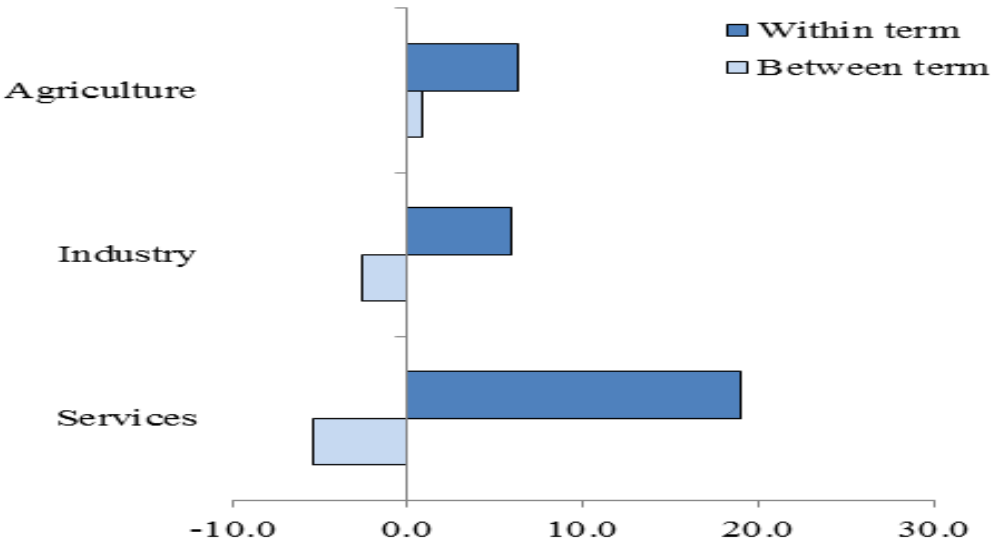
Source: Authors’ estimates from 2002/03 IAF, 2004/05 IFTRAB, and 2008/09 IOF.

A key characteristic of the structural transformation is the changing sectoral composition of output and employment, with particular attention traditionally given to manufacturing as a leading sector in driving economic growth (Roncolato and Kucera, 2013). Productivity in Mozambique might be expected to differ between sectors and sectoral sources of productivity growth and to vary over time. To examine this, growth in labour productivity is decomposed into a sector-specific “within component” and a “between component” (see Annex C for methodological details). The breakdown considers that an increase in labour productivity can result from either productivity improvements within the sector or from reallocation of employment across sectors, i.e. from low to high-productivity sectors.

The shift-share breakdown of productivity reveals that during the period of 2004-2008 industry displays the smallest contribution to aggregate productivity development (Figure 11). Services stand out with a far higher contribution to productivity growth, followed by the agricultural sector. Agriculture accounted for growth due to both an increase in the productivity within the sector and a (small) increase in the share in total employment. The between components for industry and the services sectors are found to be negative, since the employment shares of these sectors were lower in 2008 compared with 2004. The detailed breakdown of productivity growth confirms that over the whole period 2002-2008, aggregate productivity grew mainly because of productivity growth within agriculture, wholesale and retail trade, transport, communications and other services sectors (see Annex A, Figures A2-A4).

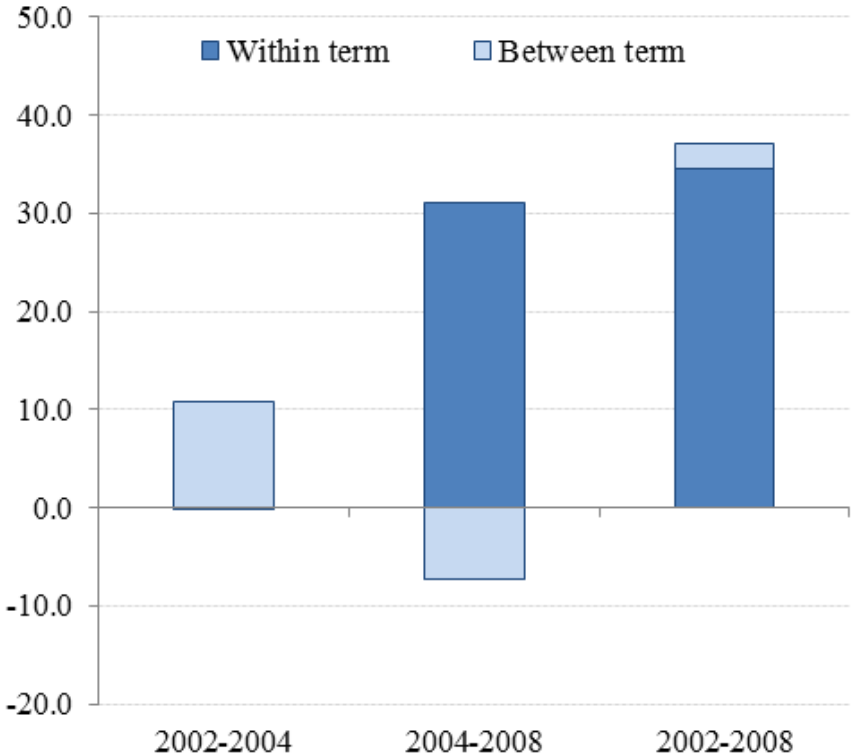
The analysis thus shows that the key determinant of productivity growth during the period 2002-2008 arises from the within-sector component. The between-sector component has slowed and was found to be negative between 2004 and 2008. Neither has the between-sector component played an important role in lifting productivity growth in the overall period (Figure 12).

Figure 11: Breakdown of labour productivity growth rate, 2004-2008, percentage



Source: GVA by broad sector is obtained from the WDI database, data on employment are from IFTRAB 2004/05 and IOF 2008/09

Figure 12: Breakdown of labour productivity growth rate, per cent



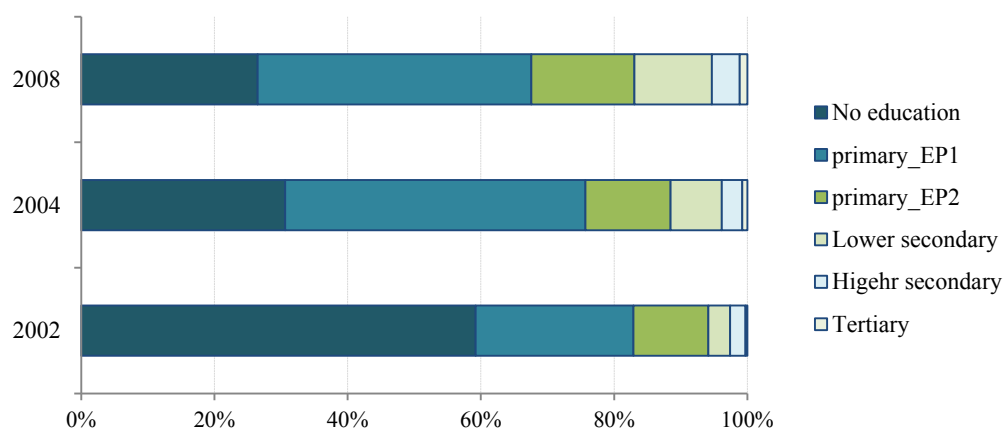
Source: Author's estimates from IAF 2002/03, IFTRAB 2004/05 and IOF 2008/09 data

3 Education profile of the labour force

According to the 1996-97 household survey, school fees were a major reason for not enrolling children in school and a series of studies provide information on the cost of education as an obstacle to enrolment in Mozambique. The three main reasons for dropping out were cost (29 per cent), lack of relevance (29 per cent), and distance to school (11 per cent). Poverty was the main reason cited for not attending school: 38 per cent of 6-12 year-olds and 27 per cent of 13-17 year-olds not enrolled in school replied that school was too expensive (World Bank, 2009). According to the 2008 IOF data, the situation has changed. About 56 per cent of 6-12 year-old children reported lack of interest as the main reason for not attending school and only 7 per cent cited cost. One reason for a ‘lack of interest’ could be the quality of education provided.

Analysis of the educational profile of the labour force in Mozambique confirms that policies for achieving universal primary education and increasing secondary school enrolment rates have resulted in an improvement in the level of education. Most workers were poorly educated in 2002 and only 17 per cent of the workforce had completed more than lower primary education level (Figure 13). Significant changes in the educational structure of the labour force took place after 2002. In particular, the proportion of people with no education fell from 59 per cent in 2002 to 26 per cent in 2008.¹² During the period 2004-2008 there was a notable increase in the share of the labour force with lower secondary level education (a 4.8 and 3.1 per cent increase for men and women, respectively). The proportion of women with no education decreased from 41 per cent in 2004 to 36 per cent in 2008. Women were less educated than men, with a particularly high concentration of individuals with no education within the female labour force (Figures 14 and 15).

Figure 13: Education profile of the total labour force (%)



Source: Authors' estimates from 2002/03 IAF, 2004/05 IFTRAB, and 2008/09 IOF.

¹² Even taking into account that the educational profile of the labour force not only benefits from the inflow of better educated, younger workers, but also from adult education programmes, the change from 2002 and 2004 seems very large; for this and other reasons much of the remainder of this paper focuses on the period 2004-2008.

Figure 14: Education profile of the labour force, male (%)

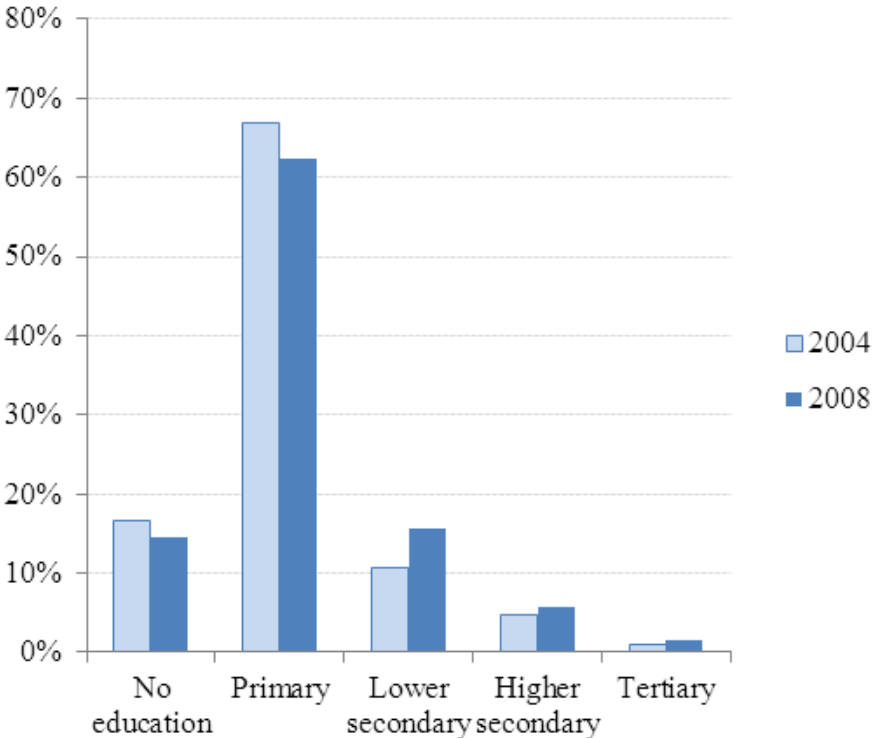
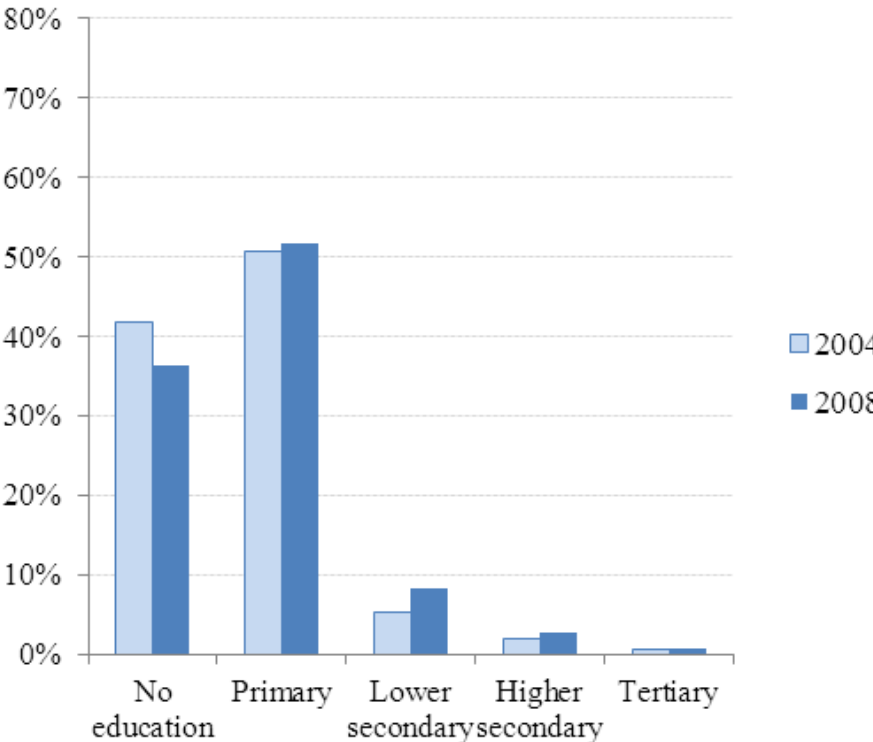


Figure 15: Education profile of the labour force, female (%)



Source: Authors' estimates from 2004/05 IFTRAB and 2008/09 IOF.

Figures 16 and 17 present the distribution of the labour force by educational level within broadly defined economic sectors. Overall, individuals with primary education dominate in industry and most of the employed with either no education or primary level

education are employed in agriculture. Within the short period of time between 2004 and 2008, the proportion of workers with lower secondary education in the services sector increased from about 18 per cent to 22 per cent, while the proportion of those with primary education decreased from 61 per cent to 53 per cent. The data also show slightly different patterns for men and women.

Figure 17: Education distribution by broad sector, 2004, % of sector employment

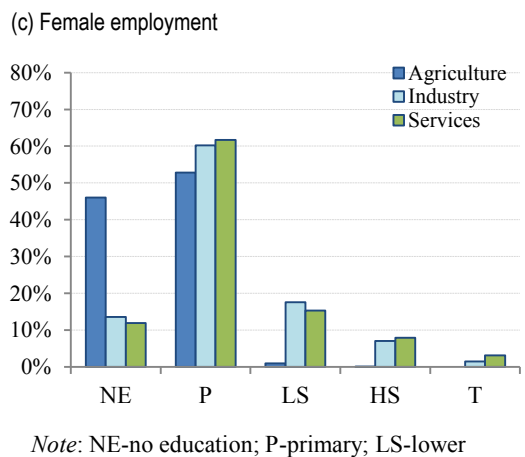
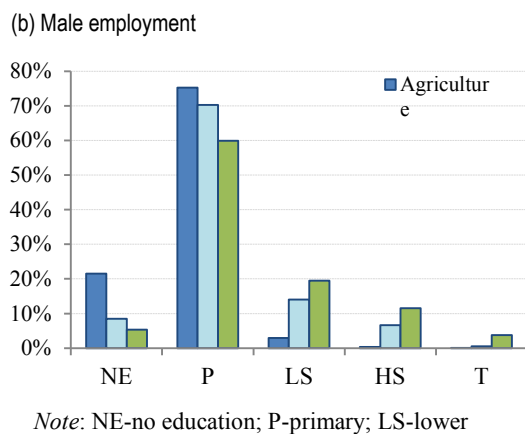
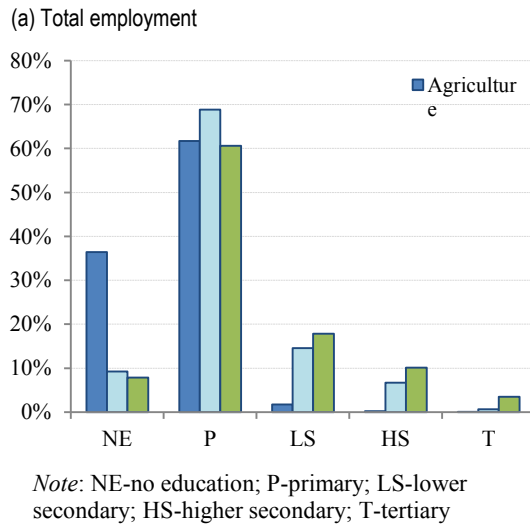
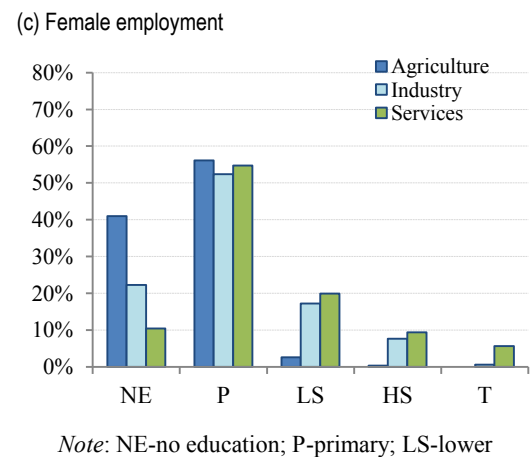
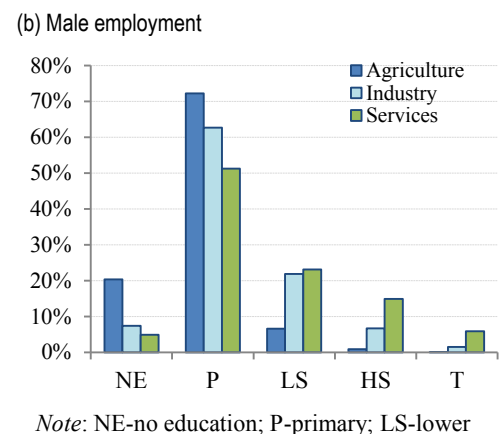
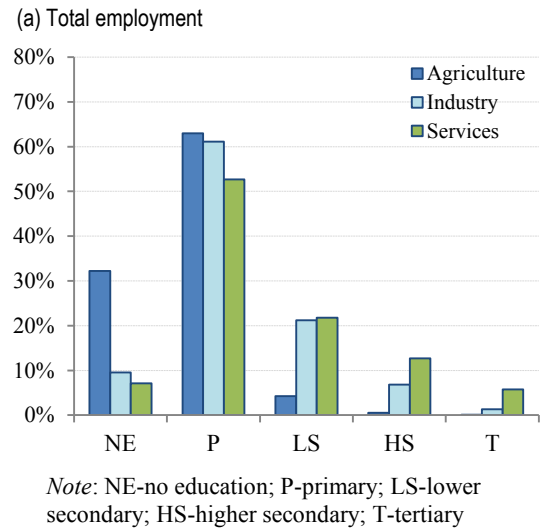


Figure 16: Education distribution by broad sector, 2008, % of sector employment



4 Education intensity and structural change

Changes in the distribution of education across sectors can be driven both by the changes in average educational attainment within sectors and changes in the employment structure across sectors. According to Sparreboom and Nübler (2013), changes in education intensity (the share of workers with a certain level of education), can be broken down into components that capture the effect of the two drivers of change in the distribution of education: *within* and *between effects*. The *within effect* captures the percentage contribution of sectors to change in aggregate intensity due to a change in the intensity within each sector, and the *between effect* captures the percentage contribution of each sector to aggregate change in education intensity due to movement of labour across sectors. Accordingly, a positive within sector effect results when the growth of the share of educated employment exceeds growth of total employment in this sector. Positive between effects are achieved when sectors grow with shares of educated workers above average education intensity in total employment. The approach therefore allows for the identification of sectors which contribute most to changes in educated employment and the extent to which within and between effects account for the changes in educational intensity of employment.

Education intensity in the estimates below measures the share of workers with at least lower secondary education within each broad sector. The change in education intensity of employed workers is assumed to indicate a change in the nature of jobs. An increase in education intensity of workers in a sector suggests the creation of good jobs, while a decrease suggests that more jobs were created with low levels of productivity (Sparreboom and Nübler, 2013).

Table 5 presents the results of the analysis separately for the labour force and for non-vulnerable employment in Mozambique. The share of workers with at least lower secondary education increased from 8.3 per cent in 2004 to 11.9 per cent in 2008, which shows that, on average, more jobs were created that employ workers with at least lower secondary education. An increase in the education intensity can be observed in all sectors and in particular in non-manufacturing industry and the services sectors. Only in the case of the unemployed did the education intensity show a decrease. The breakdown reveals a negative overall contribution of the between effect to aggregate education intensity (i.e. the effect of movements of labour across sectors and labour market states). Both the within and the between sector effects are positive in agriculture and the non-manufacturing industry sector, showing increasing productivity of workers in expanding sectors. The final two columns of Table 5 estimate the contribution of each aggregate sector as a percentage to aggregate growth in the education intensity. Agriculture and services absorbed most of the increase in the number of workers with at least lower secondary level of education, with a modest contribution from manufacturing and non-manufacturing industry.

Non-vulnerable employment, i.e. excluding self-employment and contributing family workers, is dominated by services, which account for 64.8 per cent of all non-vulnerable employment. A shift-share analysis of non-vulnerable employment shows the much higher levels of education in non-vulnerable employment as well as a larger increase in education intensity. After taking into account changes in employment patterns across sectors in 2004 and 2008, the overall aggregate increase in education intensity has been due to increased schooling of workers in the non-manufacturing industry and the services sectors. The services sectors accounted for most of the increase in education intensity in non-vulnerable employment, which is exclusively due to the within effect.

Table 5: Education intensity and structural change**(a) Labour force**

	Share of labour force (%)			Education intensity (%)			Between effect	Within effect	Contribution by sector	Contribution by sector (%)
	2004	2008	Change	2004	2008	Change				
Agriculture	72.8	76.9	4.2	2.2	5.6	3.4	0.09	2.61	2.71	75.7
Manufacturing	2.8	2.5	-0.3	21.7	26.0	4.3	-0.07	0.11	0.04	1.2
Non-manufacturing	1.8	1.9	0.1	24.3	34.2	10.0	0.03	0.19	0.22	6.2
Services	15.1	14.3	-0.8	32.8	41.9	9.1	-0.26	1.30	1.04	29.1
Unemployed	7.5	4.3	-3.2	9.5	6.6	-2.9	-0.31	-0.13	-0.43	-12.1
<i>Aggregate</i>				8.3	11.9	3.6	-0.51	4.08	3.58	100.0

Source: Authors' calculations based on 2004/05 IFTRAB and 2008/09 IOF data.

Note: Unemployment is defined in accordance with 'broad' ILO definition.

(b) Non-vulnerable employment

	Employment share (%)			Education intensity (%)			Between effect	Within effect	Contribution by sector	Contribution by sector (%)
	2004	2008	Change	2004	2008	Change				
Agriculture	15.3	11.30	-4.0	5.4	10.1	4.7	-0.22	0.53	0.32	2.5
Manufacturing	10.9	11.1	0.2	29.6	30.9	1.3	0.06	0.14	0.20	1.6
Non-manufacturing	9.0	13.8	4.8	31.5	36.8	5.3	1.52	0.72	2.25	18.1
Services	64.8	63.8	-1.0	45.2	61.0	15.8	-0.46	10.10	9.64	77.7
<i>Aggregate</i>				36.2	48.6	12.4	0.90	11.51	12.41	100.0

Source: Authors' calculations based on 2004/05 IFTRAB and 2008/09 IOF data.

A breakdown of education intensity by detailed sectoral distribution provides a more detailed picture of movement of workers across sectors, which ultimately has an effect on the overall between and within effects in driving change. Mining and quarrying, financial intermediation and health and social work showed the largest increases in education intensity between 2004 and 2008, but these sectors' small share in total employment limited their impact on the education level of the employed workforce as a whole (Table 6).

The strong increase in education intensity in mining and quarrying is hardly surprising given the considerable coal and mining resources currently being exploited in various parts of the country. Obviously, the activities of the mining industry require skilled personnel. This increase also implies that many 'good' jobs were created with an educational intensity above the average for this sector.

Table 6: Education intensity and structural change by detailed sector

	Share of labour force (%)			Education intensity (%)			Between effect	Within effect	Contribution by sector	Contribution by sector (%)
	2004	2008	Change	2004	2008	Change				
Agriculture	72.8	76.9	4.1	2.2	5.6	3.4	0.09	2.61	2.70	77.0
Mining & quarrying	0.2	0.2	0.0	10.8	29.0	18.2	0.00	0.04	0.04	1.1
Manufacturing	2.8	2.5	-0.3	21.7	26.0	4.3	-0.06	0.11	0.05	1.5
Electricity gas & water	0.1	0.2	0.0	54.2	48.6	-5.5	0.01	-0.01	0.00	0.1
Construction	1.2	1.6	0.4	23.5	34.2	10.7	0.09	0.17	0.27	7.6
Wholesale & retail trade	8.0	7.0	-1.0	19.6	27.0	7.4	-0.20	0.52	0.31	8.9
Hotels and restaurants	0.4	0.4	-0.1	33.8	38.7	4.9	-0.02	0.02	0.00	0.0
Transport, storage & com	0.8	0.8	0.0	36.4	41.2	4.8	0.00	0.04	0.04	1.1
Financial intermediation	0.5	0.3	-0.3	57.6	74.7	17.1	-0.16	0.04	-0.12	-3.3
Public administration	1.5	1.2	-0.3	64.5	69.5	4.9	-0.17	0.06	-0.11	-3.1
Education	1.4	1.7	0.3	82.5	85.3	2.8	0.27	0.05	0.32	9.1
Health & social work	0.6	0.4	-0.1	39.1	54.0	14.9	-0.04	0.07	0.03	0.7
Other services	2.1	2.5	0.4	21.8	34.9	13.1	0.09	0.32	0.41	11.6
Unemployed	7.5	4.3	-3.2	9.5	6.6	-2.9	-0.31	-0.13	-0.43	-12.4
<i>Aggregate</i>				8.3	11.9	3.6	-0.41	3.91	3.51	100.0

Source: Authors' calculations based on 2004/05 IFTRAB and 2008/09 IOF data.

The breakdown by detailed sector in non-vulnerable employment provides further evidence of the important role of the within sector effect in driving change in aggregate education intensity. Construction and education accounted for most of the change within non-vulnerable employment (Table 7).

Table 7: Education intensity and structural change by detailed sector, non-vulnerable employment

	Employment share			Education intensity (%)			Between effect	Within effect	Contribution by sector	Contribution by sector (%)
	2004	2008	Change	2004	2008	Change				
Agriculture	15.3	11.3	-4.0	5.4	10.1	4.7	-0.22	0.53	0.32	2.3
Mining & quarrying	1.5	1.7	0.2	8.2	31.2	23.0	0.01	0.39	0.40	2.9
Manufacturing	10.9	11.1	0.2	29.6	30.9	1.3	0.06	0.14	0.20	1.5
Electricity gas & water	0.8	1.2	0.4	66.9	48.2	-18.7	0.25	-0.22	0.03	0.2
Construction	6.6	10.9	4.3	21.4	36.7	15.3	0.91	1.67	2.58	18.6
Wholesale & retail trade	13.2	12.4	-0.8	28.8	37.4	8.6	-0.22	1.07	0.85	6.1
Hotels and restaurants	2.9	2.8	-0.1	34.4	57.7	23.3	-0.03	0.66	0.63	4.5
Transport, storage & com	5.0	6.2	1.2	40.0	41.7	1.8	0.46	0.11	0.57	4.1
Financial intermediation	3.8	2.0	-1.8	58.7	82.3	23.5	-1.03	0.48	-0.56	4.0
Public administration	11.8	11.3	-0.5	66.2	68.1	1.9	-0.32	0.22	-0.11	0.8
Education	10.0	16.1	6.1	81.7	85.2	3.5	4.95	0.56	5.50	39.6
Health & social work	3.0	3.4	0.3	57.5	73.7	16.2	0.18	0.54	0.73	5.2
Other services	15.1	9.7	-5.5	20.9	47.2	26.3	-1.14	2.54	1.41	10.1
<i>Aggregate</i>				36.2	48.6	12.4	3.87	8.69	12.56	100.0

Source: Authors' calculations based on 2004/05 IFTRAB and 2008/09 IOF data.

Tables 8 and 9 examine education intensity by occupational group. Education intensity increased strongly in occupations associated with higher skill needs, such as professionals and associate professional occupations, but also in occupations such as service workers and

craft workers. The breakdown suggests that higher education intensity in elementary occupations and in farming and fishing made the largest contribution to the growth in total education intensity. Restricting the analysis to non-vulnerable employment only, associate professionals, service workers, plant and machine operators and elementary occupations are found to make the largest contributions to growth in total education intensity (Table 9).

Table 8: Education intensity and employment, by occupational group

	Employment share (%)			Education intensity (%)			Between effect	Within effect	Contribution by sector	Contribution by sector (%)
	2004	2008	Change	2004	2008	Change				
Armed force	0.1	0.1	0.1	69.5	50.6	-18.9	0.04	-0.02	0.02	0.2
Legislators & Senior	0.8	0.5	-0.4	56.9	62.6	5.7	-0.20	0.03	-0.18	2.3
Professionals	0.4	0.4	0.0	88.0	97.4	9.4	-0.02	0.03	0.01	0.1
Technic & Associate	2.2	0.6	-1.6	76.7	87.4	10.7	-1.23	0.06	-1.16	15.3
Clerks & Admin	1.0	0.5	-0.5	73.8	72.5	-1.2	-0.33	-0.01	-0.34	4.5
Service workers	8.1	7.6	-0.5	21.0	29.1	8.1	-0.10	0.62	0.52	6.8
Farmers & Fisherman	77.7	82.6	4.9	2.1	5.5	3.4	0.10	2.78	2.89	38.0
Craft and related work	4.3	2.8	-1.5	21.0	30.7	9.8	-0.32	0.27	-0.05	0.6
Plant & machine	0.9	1.9	1.0	26.1	31.5	5.3	0.26	0.10	0.36	4.8
Elementary occupations	4.6	3.1	-1.5	9.4	21.7	12.3	-1.80	3.87	2.07	27.2
<i>Aggregate</i>				8.2	10.5	2.3	-3.61	7.74	4.13	100.0

Source: Authors' calculations based on 2004/05 IFTRAB and 2008/09 IOF data.

Table 9: Education intensity and non-vulnerable employment, by occupational group

	Employment share (%)			Education intensity (%)			Between effect	Within effect	Contribution by sector	Contribution by sector (%)
	2004	2008	Change	2004	2008	Change				
Armed force	0.4	1.2	0.8	69.2	50.6	-18.7	0.54	-0.22	0.32	1.4
Legislators & Senior	2.0	1.7	-0.3	83.5	88.3	4.8	-0.29	0.08	-0.21	0.9
Professionals	2.6	4.0	1.5	97.0	98.3	1.3	1.45	0.05	1.51	6.9
Technic & Associate	12.8	5.7	-7.2	84.7	91.6	6.9	-6.06	0.39	-5.67	26.0
Clerks & Admin	7.0	5.9	-1.0	75.1	72.9	-2.2	-0.79	-0.13	-0.92	4.2
Service workers	17.3	23.5	6.3	35.1	42.3	7.2	2.20	1.69	3.89	17.9
Farmers & Fisherman	9.4	14.1	4.7	5.5	6.0	0.4	0.26	0.06	0.32	1.5
Craft and related work	14.9	16.7	1.7	24.2	34.5	10.3	0.42	1.71	2.14	9.8
Plant & machine	6.0	10.5	4.5	26.8	41.3	14.6	1.20	1.53	2.73	12.5
Elementary occupations	27.7	16.7	-10.9	9.9	26.4	16.5	-1.07	5.16	4.10	18.8
<i>Aggregate</i>				35.1	40.8	5.8	-2.13	10.32	8.19	100.0

Source: Authors' calculations based on 2004/05 IFTRAB and 2008/09 IOF data.

5 Qualification mismatch

According to Carvalho (2012), lack of skilled labour in Mozambique is one of the major constraints facing entrepreneurs and the private sector. Specialized local labour is scarce, leading to competition among companies and institutions struggling to secure the most qualified staff. Skills are consistently ranked among the top five constraints in manufacturing, where 50 per cent of firms believe lack of skills poses a serious obstacle to operations and growth (World Bank, 2003). The study by Gondwe (2011) examines alignment between education on offer and the needs of the local labour market by asking employers to comment on workers experience and perceptions. The employers' view of graduates from technical and vocational schools is that the quality is low; most graduates have few practical skills and have to be re-trained. Furthermore, the level of employer satisfaction has not improved much in the past decade.

One way to assess the availability of skills in Mozambique is to consider qualification mismatch, i.e. the discrepancy between qualifications held by workers and those required by their jobs. This type of skills mismatch has received significant attention over recent years, in particular in developed economies. The current study uses three methods for the quantification of qualification mismatch, one normative and two statistical. It should be noted that these methods are concerned with levels of education and years of schooling, but not with the quality of education or the curriculum.

The normative approach uses an *a priori* assumption of a correspondence between education and occupations (Quintini, 2011). It assigns a certain level of education to each occupation and a worker is considered correctly matched if the level of education obtained corresponds to the level of education assigned to the worker's current occupation. The major groups of the International Standard Classification of Occupation (ISCO) have been used as reference groups.¹³ We assign the following levels of education to each major occupation category: jobs in major groups 1 to 3 (i.e. legislators, senior officials and managers; professionals; and technicians and associate professionals) are assumed to require tertiary education; occupations in groups 4 to 8 (i.e. clerical support workers; service and sales workers; skilled agricultural, forestry and fishery workers; craft and related trades workers; plant and machine operators and assemblers) are assumed to require (lower or higher) secondary education; and occupations in group 9 (elementary occupations) require primary education. Thus, workers in a particular group who have the assigned level of education are considered correctly matched. In a situation where a worker's highest qualification exceeds the one required by his/her current occupational level he/she is considered over-qualified, while a worker with less than the required level of education is considered under-qualified (ILO, 2013a).

The first statistical measure is based on the years of full-time education of workers and their occupation code. For each 2-digit ISCO group, the mean number of years of education as well as its standard deviation is measured. Then the over- (under-) educated are respondents who have education years above (below) the mean level by one standard deviation. Workers are identified as correctly matched if completed years of schooling fall within one standard deviation around the mean level of schooling for each occupational group. The second statistical approach uses the mode of education for each 2-digit occupational group (in total years of schooling) and a worker is identified as correctly matched if years of education obtained equal the mode of years of schooling for the respective occupational group. Unlike in the previous case, educational requirements are not defined according to the range of standard deviation, but are rather based on the point estimates of the statistics.

¹³ See ILO (2013a). The assignment of skill levels to major occupational groups is based on ILO (2012).

The results based on these three methods are significantly different (Figure 18). Nevertheless, the pattern of qualification mismatch allows a number of conclusions. The normative method suggests that the overwhelming majority of Mozambican workers possess fewer qualifications than are required by their jobs. In 2004, 92.6 per cent of workers were under-qualified and only 6.9 per cent correctly matched. The incidence of qualification mismatch declined between 2004 and 2008, but the overall pattern across groups observed in 2004 remained. The pattern of skills mismatch differs between men and women, and the incidence of mismatch was higher among women. Results clearly indicate an improvement of the position of young workers. The incidence of correctly matched young workers (aged 15-29) increased from 9.2 per cent in 2004 to 15.8 per cent in 2008. Overall, the method indicates that between 2004 and 2008 there was an increase in the incidence of the correctly matched workers across all groups of the population.

The extent of qualification mismatch is less pronounced when the mean-based statistical method is used, but the majority remain under-qualified. In particular, about 66.8 per cent of workers in 2004 and 60.7 per cent in 2008 are estimated to be under-qualified. The share of correctly matched workers is again higher among men than among women. Furthermore, the mean-based method suggests that the share of young overqualified workers increased from 16 per cent in 2004 to 31 per cent in 2008. Mode-based calculation of mismatch results in higher estimates of the extent of the correctly matched workers. The method suggests that around 43 per cent of workers in 2004 and 39 per cent of those in 2008 are correctly matched.

Turning to the occupational composition of qualification mismatch at the one-digit level (Figure 19, estimates using the normative method are shown), there is some variation across occupational groups. The incidence of the mismatch is high in occupational groups such as managerial and senior officials, skilled agriculture and fishery workers, and technicians and associate professionals. The proportion of both males and females who are correctly matched increased between 2004 and 2008 in most occupational groups. Results for non-vulnerable employment further suggest that the incidence of mismatch is lower for this group of workers, reflecting the higher educational intensity discussed earlier (Figure 20). Some results, such as the increase in over-qualification for female clerks and administrative workers, may be related to the quality of education.

Determinants of the qualification mismatch

Studies that investigate the main causes of education mismatch can broadly be divided into two groups, dealing with labour supply (workers') characteristics and labour demand characteristics. Table 10 examines factors related to qualification mismatch in Mozambique in 2004 and 2008, focusing on individual characteristics such as age, marital status, levels of education obtained and region. The marginal effects for the three outcomes of interest (correctly matched, under-qualified and over-qualified) are reported.¹⁴ Several findings emerge from the estimated model:

- Education level is found to be a statistically significant predictor of qualification mismatch outcomes. Those with primary, secondary or higher education are significantly less likely to be under-qualified than those with no education. The higher a worker's qualifications, the greater his or her risk of being over-qualified for the job he or she holds.

¹⁴ The dependent variable takes value 1, which corresponds to respectively being under-qualified, correctly matched or overqualified, derived from the mean-based statistical method. The estimated marginal effects should be interpreted as increasing (decreasing) the risk of over-qualification or under-qualification if they are positive (negative).

- Under-qualification is found to decline with age, suggesting that workers may find a job that better matches their education over time; a complementary explanation could be a relatively high proportion of older workers in low level jobs.
- Women have a higher probability than men of being over- or under-qualified (mismatched), which is in line with the literature and the descriptive statistics. Such gender differentials may be attributed to differences in educational attainment between men and women, traditional gender roles and pressures on women to take caring roles and to reconcile work and family life. The model also shows that working in an urban area marginally reduces the risk of over-qualification and raises the risk of under-qualification, reflecting the more limited availability of jobs in rural areas.

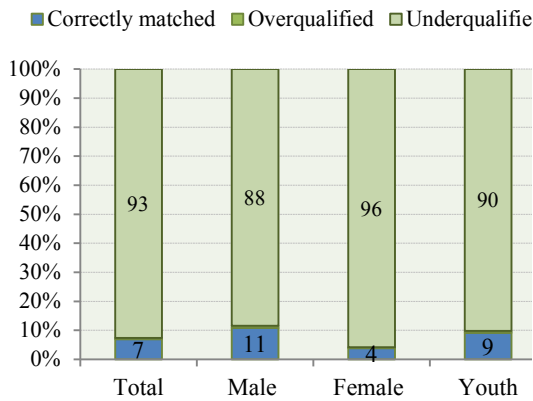
Table 10: Determinants of qualification mismatch, marginal effects

	2004			2008		
	Correctly matched	Over-qualified	Under-qualified	Correctly matched	Over-qualified	Under-qualified
Age	0.0025*** (37.35)	0.0003*** (5.85)	-0.0059*** (-36.82)	0.0001*** (12.02)	-0.0000*** (-4.73)	-0.0006*** (-8.50)
Agesq	-0.0000*** (-34.40)	-0.0000*** (-7.80)	0.0001*** (35.45)	-0.0000*** (-10.54)	0.0000*** (4.34)	0.0000*** (6.04)
Female	-0.0076*** (-20.83)	0.00028*** (6.28)	0.0121*** (14.84)	-0.0062*** (-16.89)	0.0015*** (5.41)	0.0155*** (10.37)
Married	-0.0014 (-1.45)	0.000019 (-0.02)	0.0044* (1.71)	-0.0008 (-1.43)	0.0004 (0.85)	0.0015 (0.55)
Single	-0.0038*** (-3.63)	-0.0008*** (-3.59)	0.0174*** (6.68)	-0.0110*** (-17.39)	-0.0043*** (-7.19)	0.0589*** (19.98)
HH size	-0.0004*** (-7.92)	-0.0000*** (-2.78)	0.0010*** (9.26)	-0.0003*** (-7.24)	-0.0000 (-0.63)	0.0015*** (6.62)
Illiterate	0.0065*** (11.17)	-0.0054*** (-18.40)	0.0075*** (6.29)	0.0029*** (4.85)	-0.0110*** (-18.20)	0.0267*** (11.97)
Primary	0.8195*** (70.41)	0.3249*** (42.09)	-0.9197*** (-74.12)	0.9084*** (60.11)	0.8046*** (51.87)	-0.9910*** (-65.73)
secondary_ESG1	0.9971*** (61.38)	0.9806*** (46.23)	-0.9988*** (-71.24)	0.9945*** (53.93)	0.9985*** (57.27)	-0.9995*** (-66.21)
secondary_ESG2	0.9972*** (58.36)	0.9959*** (45.37)	-0.9935*** (-67.52)	0.9986*** (54.18)	0.9989*** (54.11)	-0.9927*** (-63.36)
Higher	0.9947*** (52.01)	0.9988*** (44.52)	-0.9855*** (-62.03)	0.9968*** (48.93)	0.9974*** (52.36)	-0.9811*** (-59.34)
Urban	0.0065*** (17.11)	-0.0035*** (-29.69)	0.0094*** (8.85)	0.0015 (1.25)	-0.0170*** (-9.82)	0.0487*** (6.83)
Regions	Yes	Yes	Yes	Yes	Yes	Yes
N	36968	36968	36968	22895	22895	22895
R ²	0.3048	0.2729	0.3445	0.3266	0.2959	0.3915

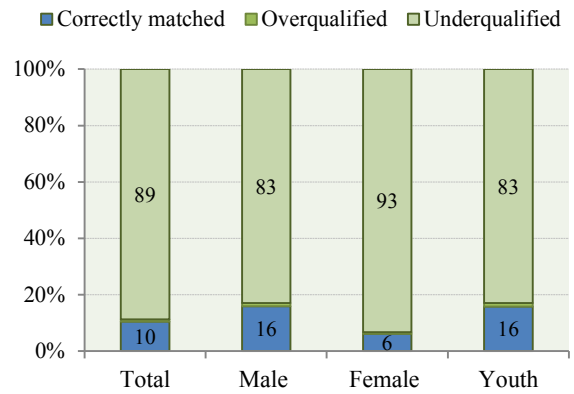
Notes: *t* statistics in parentheses * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$.

Figure 18: Estimation of qualification mismatch, different methods (%)

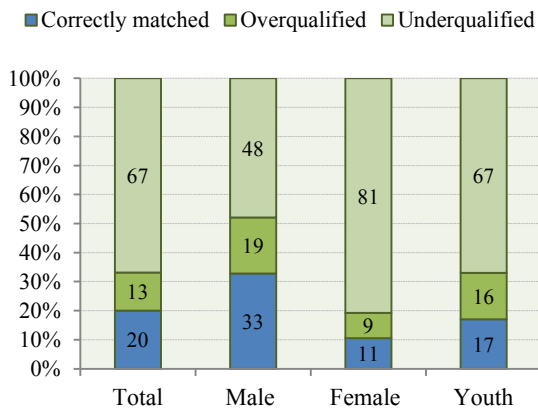
(a) Normative method, 2004



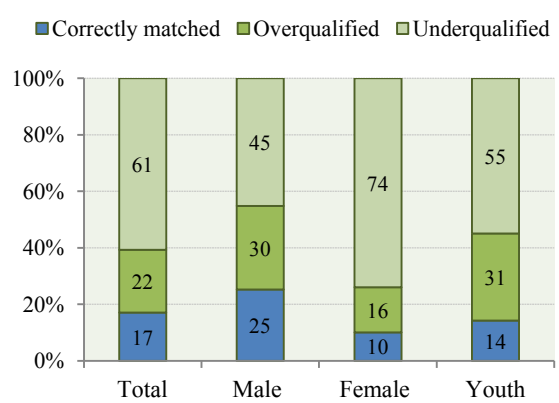
(b) Normative method, 2008



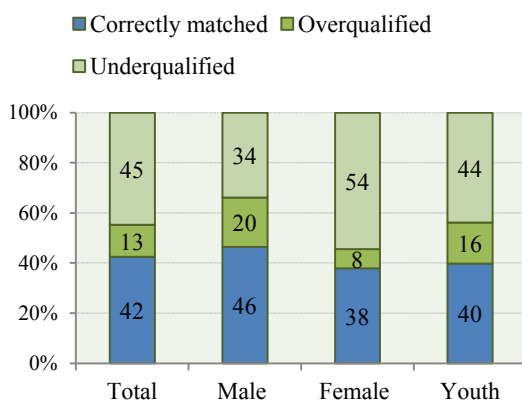
(c) Statistical (mean-based) method 2004



(d) Statistical (mean-based) method 2008



(e) Statistical (mode-based) method 2004



(f) Statistical (mode-based) method 2008

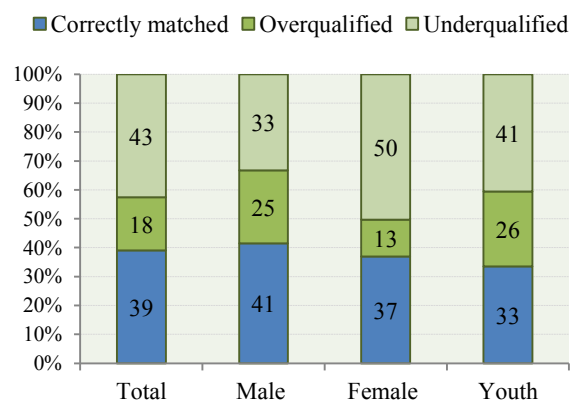
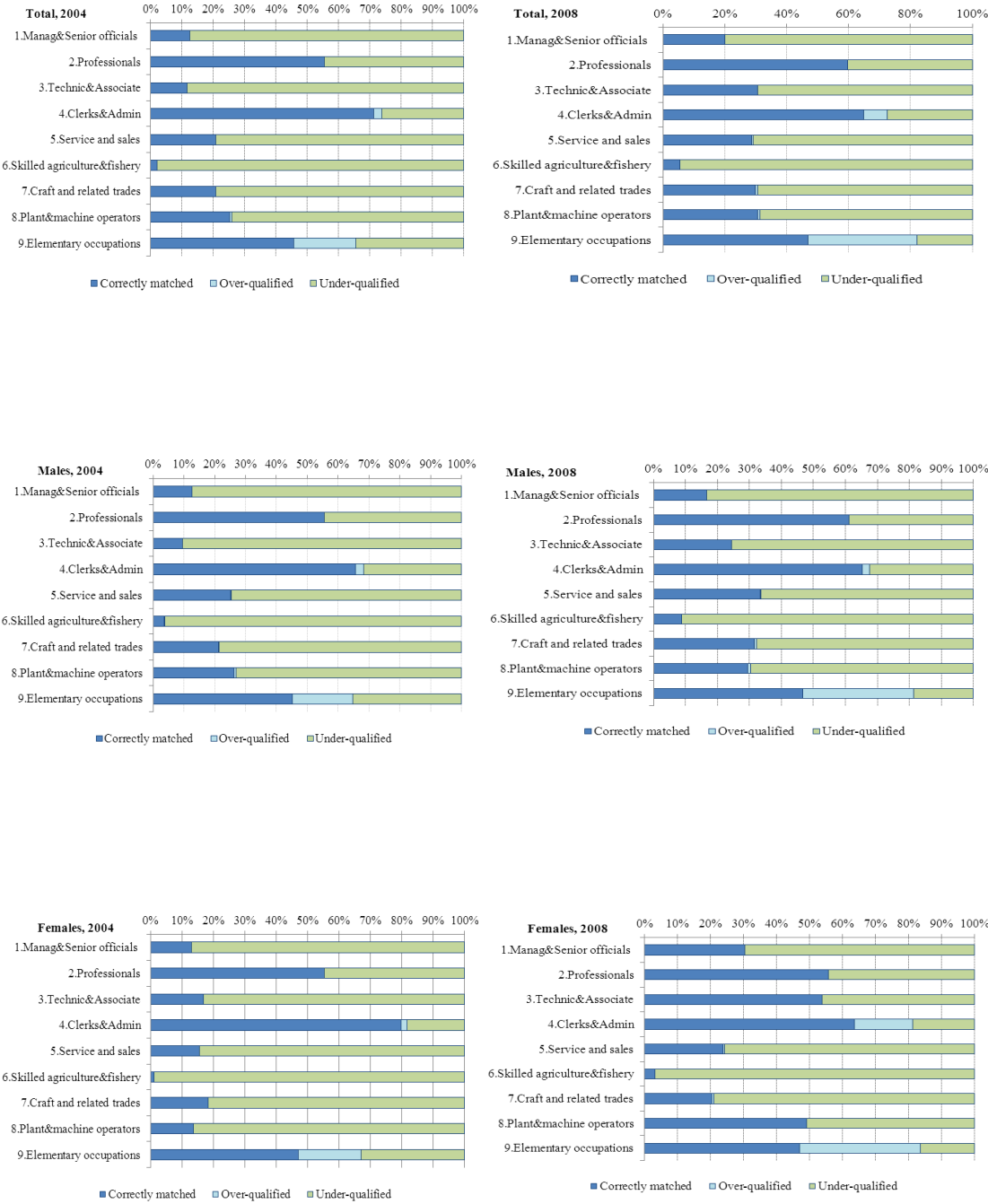
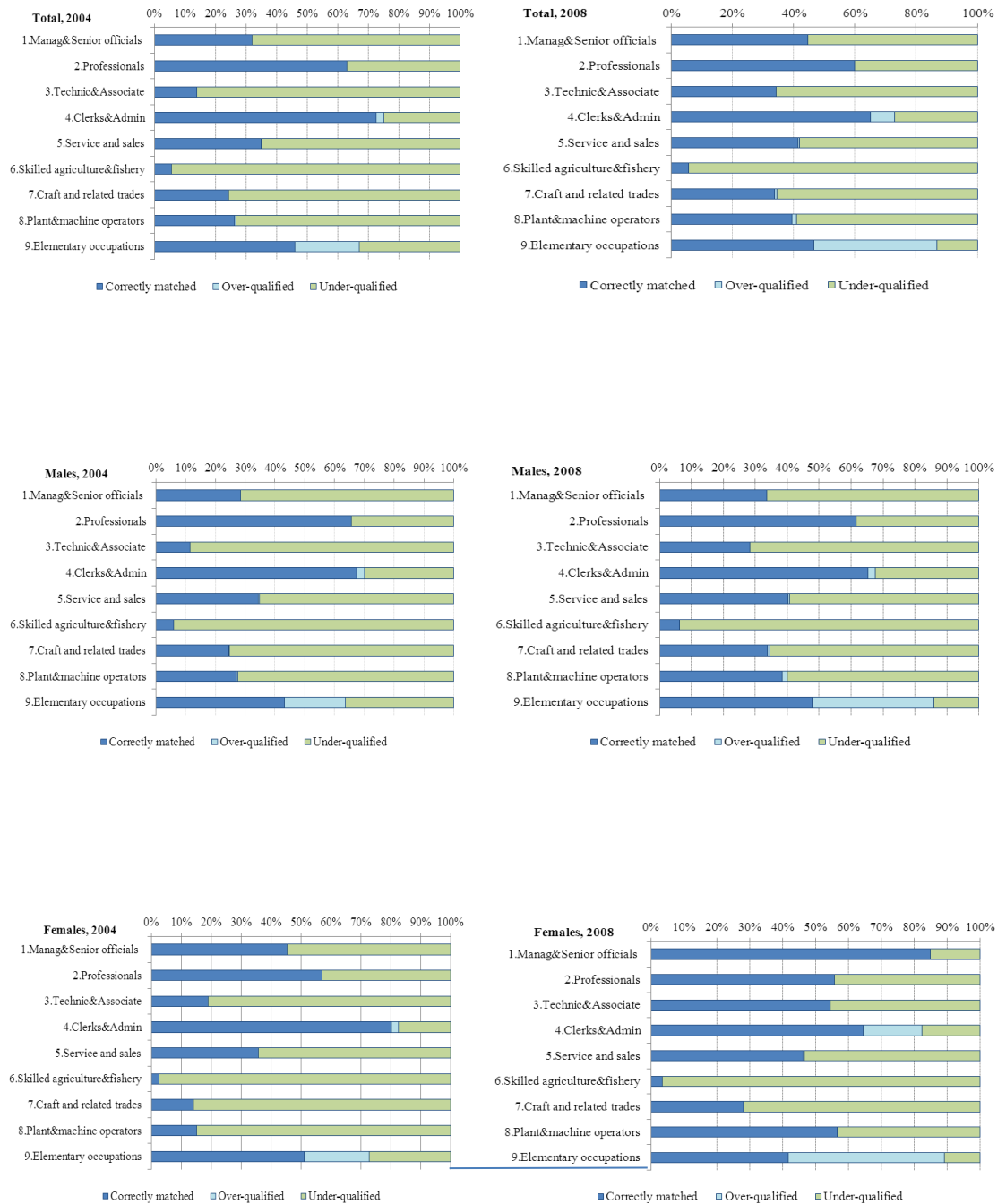


Figure 19: Qualification mismatch by major occupational group in 2004 and 2008, normative method (%)



Source: Mozambique IFTRAB 2004/05 and IOF 2008/09 data.

Figure 20: Qualification mismatch by major occupational groups in 2004 and 2008, non-vulnerable employment, normative method (%)



Qualification mismatch and earnings in Mozambique

Earnings are related both to an individual's human capital and to the requirements of the job. In the current study, individual earnings are modelled to identify the effect of under-qualification and over-qualification on the level of earnings in Mozambique, controlling for classic explanatory variables.¹⁵ The results are presented in Table 11 and described below.

A penalty for over-qualification and a premium for under-qualification is evident after controlling for the level of education and other individual characteristics. In both years the penalty associated with over-qualification and the premium for under-qualification is found to be substantial. Over-qualified workers earn around 33 per cent less than their exactly matched peers, suggesting that skills in Mozambique might be under-utilized or over-qualified graduates had less marketable skills than appropriately qualified individuals. Conversely, the under-qualified earned around 35 per cent more in 2008 than workers with the same qualifications who were well-matched to their job. A wage premium for under-qualification is in line with Herrera and Merceron (2013), where a similar model for Sub-Saharan Africa has been estimated. Hartog (2000) also found that over-education generates a wage penalty. The magnitude of the premium associated with under-qualification is found to be smaller in 2008, and in the log-linear model the parameter corresponding to over-qualification more or less equals the absolute value of the parameter corresponding to the under-qualification dummy variable.

The findings on the earnings of over- and under-qualified workers are in line with the general patterns identified in the literature (which has been limited mostly to developed economies). For instance, according to *job-search theory* (Stigler, 1961), individuals search for jobs until the marginal costs of continuing search equal its marginal benefits. The longer the job-search continues, the more willing the individual becomes to accept a lower wage level and to decrease his/her reservation wage. Hence, his/her reservation wage may fall to the level of job for which he/she is over-qualified. On the other hand, *assignment theory* highlights the importance of the balance between supply and demand for individuals with different skills; if there is excess supply of lower-skilled workers, they will fill the higher skill positions and vice versa (Quintini, 2011).

¹⁵ See the Annex C for details of regression specifications.

Table 11: Earning equation with under-qualification and over-qualification variables

(log of hourly earnings)	(1) 2004	(1) 2008
Over-qualified	-0.3284*** (-9.46)	-0.3328*** (-7.79)
Under-qualified	0.5944*** (15.83)	0.3527*** (7.81)
Years of education	0.2179*** (44.81)	0.1467*** (23.59)
Age	0.0960*** (17.55)	0.0150*** (9.49)
Age squared	-0.0009*** (-13.67)	-0.0000*** (-9.40)
Female	-0.2224*** (-8.69)	-0.0309 (-0.83)
Married	0.1494** (2.33)	0.0454 (0.93)
Single	0.0381 (0.55)	-0.2020*** (-3.48)
HH size	-0.0070* (-1.93)	-0.0077 (-1.56)
Illiterate	0.1192*** (3.05)	0.0488 (0.88)
Self-employed	-0.2410*** (-2.73)	0.3855*** (6.90)
Family workers	-0.3401** (-1.97)	-0.6403*** (-12.14)
Public sector	0.2533*** (8.88)	0.2288*** (5.70)
Urban	0.0133 (0.40)	0.0660 (0.68)
Disability	-0.2197* (-1.66)	-0.0260 (-0.56)
Second activity	0.2933*** (3.78)	0.0408 (0.97)
constant	-1.8522*** (-14.20)	0.8554*** (6.37)
<i>N</i>	5274	4109
<i>R</i> ²	0.574	0.346

Notes: *t* statistics in parentheses * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$.
The models include regional dummies.

6 Returns to education

Returns to education in Mozambique were estimated using two measures of schooling: total years of schooling, and levels of educational attainment. Gender differences were examined, as evidence shows men typically earn higher incomes. Further disaggregation by economic sector is also provided (see Annex C for methodological details).

The dependent variable in the analysis is the logarithm of hourly earnings resulting from the primary occupation of workers and excludes earnings from secondary jobs. The vector of exogenous control variables used in the estimations also includes potential experience (linear and quadratic terms), urban residence and gender.

Estimates of the return to one additional year of schooling for the overall economy and across broad sectors are reported in Table 12.¹⁶ The return is estimated to be about 21 per cent on average over the whole 2004 sample. This return is much higher than the global mean rate of return of 9.7 per cent reported in Psacharopoulos and Patrinos (2004, Table 3), and in line with relatively high estimates for Sub-Saharan African countries. Returns to a year of schooling significantly declined during the period 2004 to 2008, which is also suggested in some other studies. For example, Schultz (2004) finds similar results for Côte d'Ivoire, Ghana, Kenya and Nigeria, and a study by the World Bank (2006) found declining returns in Uganda. We find that the average returns to education in Mozambique declined from 20.8 per cent for an extra year of schooling in 2004 to 15.6 per cent in 2008. The results show a decline in estimated returns for both men and women, with a 4.5 per cent decline for men and 6.7 per cent for women.

In addition, the return to an additional year of schooling systematically differs across broad sector categories. According to the estimates, employment in agriculture resulted in the lowest return to education. The gender analysis also demonstrates that the fall over time was substantially different across genders. For instance, there was a 14.2 per cent fall in returns to education in the manufacturing sector for women and a 4.9 per cent fall for men in the same sector.

Table 12: Returns to education, years of schooling

	All sectors		Agriculture		Manufacturing		Mining and construction		Services	
	2004	2008	2004	2008	2004	2008	2004	2008	2004	2008
Total	20.8	15.6	8.2	7.4	18.1	11.6	14.2	9.0	23.3	18.0
Men	19.5	15.0	7.4	9.3	17.4	12.5	13.3	8.5	22.1	16.9
Women	24.4	17.7	11.5	-0.1	21.4	7.2	35.0	39.4	25.4	21.8

Source: Authors' estimates from 2004/05 IFTRAB and 2008/09 IOF data.

There are at least four potential (and not mutually exclusive) explanations for a decline in returns to education: a reduction in the relative demand for skilled workers; an increase in the relative supply of skilled workers; an increase in the minimum wage and unionization rates benefiting low-wage workers more than high-wage workers; and a degradation of tertiary education (Lusting et al., 2013).^{17,18} In the Mozambican context,

¹⁶ The estimated coefficients with respective significance levels are presented in the tables in Annex C. Returns to education are positive and statistically significant at the 1% significance level.

¹⁷ Gonzales and Oyelere (2009) suggest a fall in quality and a supply-demand argument as possible reasons for the decline in returns to education in Venezuela. Purnastutia et al. (2013) show that returns to education in Indonesia generally declined between 1993 and 2007-08, following the large-scale expansion of the sector. The authors argue that both recent growth in the education sector (which by itself could depress the return to education) and growth across the Indonesian economy (which could differentially increase demand for

with its policies of improving access to education and rising enrolment rates, returns to education might be expected to fall gradually from their relatively high levels,¹⁹ unless demand for educated workers expands accordingly. However, demand is held back by the lack of structural change, and in particular the lack of relative growth in sectors absorbing better-educated workers. As highlighted above, most of the increase in education intensity in the country is due to within sector change in education intensity (table 5), which limits the expansion of demand for educated workers.

Analysis of returns at different education levels in Mozambique provides further insights into the dynamics of returns between 2004 and 2008 (Table 13). Returns to primary education are found to be relatively low. Specifically, the results show that an individual who has completed primary education would earn on average 4 per cent more than an individual with no schooling at all in 2008, and in some sectors returns to primary education are actually negative. Only women with tertiary education experienced a marginal increase in their return to education across all sectors. In line with recent findings for Tanzania (Sparreboom and Nübler, 2013), attaining a higher secondary school qualification is found to result in a substantial increase in earnings and to exceed the mark-ups for tertiary degree graduates. Annualized aggregate rates of returns to higher secondary education are found to be 38.9 per cent in 2004 and 29.7 per cent in 2008 whereas the annual returns to a tertiary degree are 24.3 per cent and 19.7 per cent respectively.

The data for Mozambique also show that between 2004 and 2008 returns to tertiary education decreased, and this trend was driven primarily by the decrease in the return to tertiary education in manufacturing and the services sectors. Finally, the rate of return to lower secondary education is greater for females than for males, and this is in line with some other studies.²⁰

graduates at various levels of education) have played a role in determining the declining pattern of change over time.

¹⁸ Colclough et al., (2010) argue that the relative decline in wage returns to primary education over time may be due to both supply-side and demand-side factors, working separately or in combination.

¹⁹ Lopez-Calva and Lusting (2010) show that the most important factor behind the decline in the returns to education in Latin America has been an increase in the relative supply of workers with completed secondary and tertiary education, a result of the significant educational upgrading that took place in Latin America during the 1990s. This is supported by Azevedo et al. (2013), who suggest that the decline in the skill premium has been driven by an increase in the supply of experienced and educated workers in the region.

²⁰ See, for example, King and Hill (1993).

Table 13: Returns to education, annualized rates, level of schooling

	All sectors		Agriculture		Manufacturing		Mining and construction		Services	
	2004	2008	2004	2008	2004	2008	2004	2008	2004	2008
Primary	5.8	4.2	0.7	-3.4	4.6	6.3	2.7	-1.5	7.1	8.7
Lower secondary	25.0	13.4	20.6	10.7	18.6	10.1	16.4	4.2	27.8	15.1
Higher secondary	38.9	29.7	43.8	39.6	42.2	29.1	38.6	34.8	38.0	27.8
Tertiary	24.3	19.7	6.9	20.1	33.2	12.6	27.8	24.9	24.2	19.6
Men										
Primary	5.5	4.4	0.7	-2.5	3.3	9.6	2.8	-1.9	7.0	8.0
Lower secondary	23.1	12.0	20.2	12.3	19.2	10.7	15.3	4.7	25.5	13.1
Higher secondary	35.5	31.5	31.5	40.0	41.4	28.8	37.8	29.0	33.6	29.8
Tertiary	25.8	18.9	12.9	19.2	33.1	10.4	28.7	27.3	25.9	18.3
Women										
Primary	6.2	3.5	0.8	-4.5	8.3	0.0	.	.	6.8	13.4
Lower secondary	31.4	20.4	27.1	2.0	13.9	6.4	.	.	32.1	22.5
Higher secondary	47.2	24.9	69.3	30.7	37.4	30.0	.	.	46.9	23.7
Tertiary	20.9	21.4	.	.	38.5	35.8	.	.	20.4	22.0

Source: Authors' estimates from IFTRAB 2004/05 and IOF 2008/09 data.

Notes: Earnings are measured in log hourly earnings. Rates of return to different levels of education are calculated by dividing the difference of regression coefficients estimating the return to a particular and the preceding level of education by the duration of each level of schooling. The missing cells are due to insufficient sample size.

7 Summary and conclusions

This paper examines patterns of structural transformation and changes in educational attainment and employment in Mozambique. The macro-economic review and micro-econometric analysis point to a number of conclusions regarding structural transformation and changes in education and their role in determining labour market outcomes in Mozambique.

- It is evident that the performance with regard to the expansion of the school system has resulted in a notable increase in enrolment rates at primary and secondary level. The gross primary enrolment rate increased from 62 per cent in 1994 to 110 per cent in 2012. There was also an improvement in enrolment in secondary education (from 7 per cent in 1994 to 26 per cent in 2012), although tertiary enrolment continues to be low. Significant change in the educational structure of the labour force has taken place, with the proportion of workers with no education falling from 59 per cent in 2002 to 26 per cent in 2008.
- Despite the Government's achievements in raising education levels, the overall low skills level of the labour force continues to be a significant challenge. More than 80 per cent of the labour force has attained at most a primary education qualification. Higher education remains something of a luxury, with only 1.6 per cent of men and less than 1 per cent of women reported to hold a tertiary degree in 2008. Challenges also remain with regard to the quality of education.
- There is a wide gender gap in educational attainment, reflected in a high proportion of women with no education and a relatively low proportion of women with higher levels of education. Over the period 2002-2008, adult illiteracy rates for women were also much higher than for men (70 per cent and 49 per cent, respectively). Increased efforts are needed to reduce the gender gap.
- Mozambique registered remarkable economic performance in the last decade, with average annual GDP growth exceeding 7 per cent and economic growth reaching 7.4 per cent in 2012. However, growth has to an important extent been driven by mega projects, financed by foreign investment particularly in extractive industries, and economic growth has failed to generate sufficient decent employment opportunities. The structure of the economy remains narrowly based on subsistence agriculture, which accounted for 31 per cent of GDP in 2010.
- Widespread low quality employment in Mozambique is reflected in a high employment-to-population ratio, which reached an estimated 79 per cent in 2010. Changes in the EPR can largely be attributed to employment in agriculture.
- Successful economic transformation is associated with a movement of labour out of the rural agricultural sector into the urban industrial sector, leading to higher productivity levels and progressively rising income levels. This is not, however, the case observed in Mozambique. Despite its strong and sustained economic growth, the economy has undergone minimal transformation, and labour has failed to move from low to high productivity sectors. The workforce is concentrated in the agriculture sector, which accounted for more than 80 per cent of employment in 2008, while employment in industry has stagnated at less than 5 per cent of employment. The persistent concentration of employment in low productivity sectors, such as agriculture, indicates that many of the jobs created in the country were of low quality.

- The standard development discourse suggests that, with economic growth, the vulnerable employment rate will decline as structural transformation of both the economy and employment occurs (Sparreboom, 2011). The vulnerable employment rate, calculated as the share of own-account workers and unpaid family workers in total employment, was 89.3 per cent in 2004 and 90.6 per cent in 2008. The high rate of vulnerable employment is an indication of a small formal economy.
- During the period of 2004-2008, the broad services sector stood out in terms of productivity growth, followed by industry and agriculture. Most of aggregate productivity growth can be explained by growth within the broad services and industry sectors, while agriculture contributed to productivity growth due to both increase in productivity within the sector and an increasing share in total employment.
- In contrast to neighbouring Tanzania, where productivity growth was almost exclusively due to between-sector effects (Sparreboom and Nübler, 2013), aggregate productivity growth in Mozambique is mostly explained by the within-sector component. These findings suggest that Mozambique still faces fundamental restructuring, and the potential for productivity growth due to structural change remains unexploited.
- Based on education intensity of employment, the study considers which sectors contribute most to changes in educated employment and the extent to which changes in job quality and productivity are accounted for by *within* and *between* sector effects. The literature suggests the relative importance of the between sector component in an early stage of economic development. At later stages, however, productive transformation within sectors becomes more important, and such transformation requires additional education over and above the education intensity needed for the sectoral reallocation of workers. Between 2004 and 2008, aggregate education intensity in Mozambique increased from 8.3 per cent to 11.9 per cent, and an increase in education intensity can be observed in all sectors of employment. The results based on the breakdowns of education intensity show the greater importance of within-sector effects, which is an indication of a narrow enclave development path where transformation is only happening in a very small part of the economy (restricted to non-vulnerable employment). The services sectors accounted for most of the increase in education intensity within non-vulnerable employment. A disproportionate share of more educated workers is entering occupations associated with higher skills, such as professionals and associate professionals, but the shares of these occupations in employment is still low.
- A good match in terms of qualifications and jobs is a sign of a well-functioning educational system adapted to the needs of the national labour market. Based on the normative method to quantify qualification mismatch, the current study found that only 10 per cent of workers in 2008 possess qualifications that match those required for their jobs. Overall, mismatch declined only slowly between 2004 and 2008, and is therefore likely to limit technological advancement and the utilization of opportunities offered by natural resources and extractive industries. The high rate of qualification mismatch found in Mozambique underlines the need for policies to widen access to education at secondary and tertiary levels, as well as the need for improved quality of education.
- Under-qualified workers are found to earn around 35 per cent more in 2008 than workers with the same qualifications who are well matched to their jobs. Over-qualified workers earn around 33 per cent less than their well-matched peers.
- The return to education at national level is estimated at around 21 per cent in 2004 and 16 per cent in 2008. Across all sectors, the average returns to education decreased between 2004 and 2008. This decline in the estimated rate of return to education, which nevertheless remains high in comparison with most countries, seems to be due to the

limited increase in demand for better educated workers, which is in turn at least partly due to the lack of structural change.

- The shape of the education earnings profile is found to be convex in which upper secondary and tertiary education earn the highest returns in the labour market. This has implications for the poverty-reducing effects of education; in particular, expanding enrolment only at lower levels of education might not raise earnings substantially and consequently would not be effective in helping people out of poverty.
- Economic policies need to support structural transformation and in particular support employment creation in more innovative activities and dynamic sectors. In Mozambique, there is also a strong need to examine the nature and composition of the demand for workers in extractive industries.

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Annex A: Additional figures and tables

Table A1: Illiteracy rate by age group and gender (%)

<i>Age groups</i>	Men			Women		
	2002	2004	2008	2002	2004	2008
15-19	27.2	23.8	20.1	48.0	44.4	37.1
20-24	30.4	29.8	20.3	56.8	57.5	50.5
25-29	41.5	37.6	32.8	66.1	65.2	62.0
30-34	30.2	34.4	37.1	68.4	66.4	67.6
35-39	29.3	32.1	36.9	68.0	71.9	68.8
40-44	32.6	28.1	29.4	79.3	72.9	68.5
45-49	37.0	32.4	35.8	86.8	81.1	77.6
<i>All sample</i>	48.9	49.0	48.1	70.3	70.2	67.5

Source: 2002/2003 IAF, 2004/2005 IFTRAB and 2008/2009 IOF data.

Table A2: Primary education system performance (%)

Indicator	1973	1991	2001	2005	2008	2011
<i>Drop-out rate</i>						
Primary. Grade 1	40.85	8.42	14.90	14.52	15.08	16.54
Primary. Grade2	30.76	15.45	9.86	12.95	12.23	13.14
Primary. Grade 3	27.75	25.15	12.06	9.68	11.38	12.94
Primary. Grade 4	28.58	15.08	11.53	12.01	14.00	19.29
Primary. Grade 5	-	-	20.17	21.71	20.78	21.62
% of repeaters in primary; all grades	27.98	24.49	22.78	10.38	5.51	7.67
Primary completion rate. Total	8.18	26.78	18.92	41.63	58.89	56.24

Source: World Bank (2013b).

Table A3: Sector performance and detailed economic structure (1991-2010)

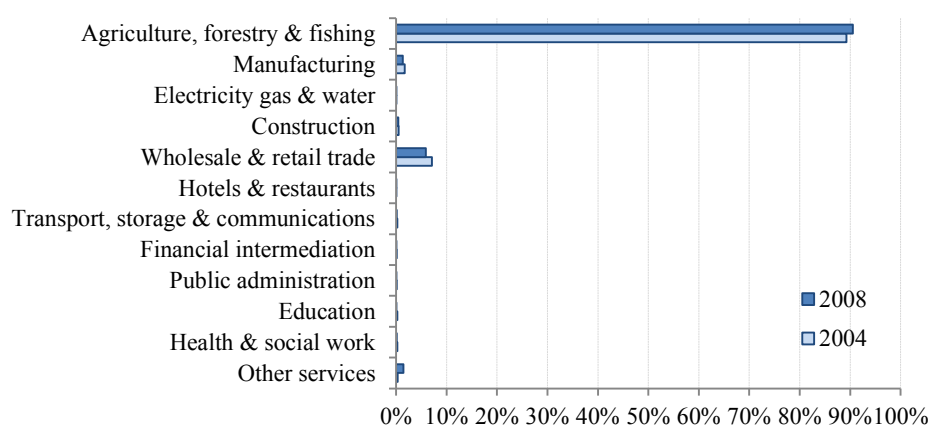
	Sector Value Added (% GVA)			
	1991-1995	1996-2000	2001-2005	2006-2010
Agriculture, hunting, forestry, fishing	36.0	30.7	26.5	29.9
<i>Industry</i>	14.8	20.6	25.6	24.6
Construction	4.6	7.6	4.5	3.2
Gas, Electricity and Water	0.6	1.9	4.8	5.5
Manufacturing	9.5	10.8	15.5	14.4
Mining and Quarrying	0.2	0.3	0.7	1.5
<i>Services, etc.</i>	49.2	48.7	47.9	45.5
Banking	4.9	3.2	4.0	4.6
Other services	4.4	7.2	7.2	6.5
Ownership of Dwellings	5.1	3.5	8.5	6.1
Public Administration and Defence	4.6	3.1	4.1	4.0
Transport, Storage and Communication	9.8	9.5	10.7	9.8
Wholesale and Retail Trade	20.4	22.2	13.4	14.5

Source: African Development Indicators (2011).

Table A4: Total employment and sectoral shares in employment

	2002	2004	2008
Total employment (in thousands)	9205	9656	10572
<i>Share in total employment (%)</i>			
Agriculture	80.49	78.69	81.05
Mining & quarrying	0.53	0.25	0.21
Manufacturing	0.76	3.06	2.57
Electricity, gas & construction	2.10	1.67	1.68
Wholesale	7.03	8.85	7.03
Transport, storage	0.99	0.92	0.80
Services	5.02	2.97	0.74
Social work, administration	3.09	3.60	5.92

Source: IAF 2002/2003, IFTRAB 2004/2005 and IOF 2008/2009 data.

Figure A1: Sectoral distribution of vulnerable employment

Source: Authors' estimates from 2004/05 IFTRAB and 2008/09 IOF.

Table A5: Occupational distribution of vulnerable employment (%)

	2004		2008	
	Male	Female	Male	Female
Armed forces	0.0	0.0	0.0	0.0
Managers & Senior officials	1.2	0.3	0.6	0.1
Professionals	0.2	0.0	0.0	0.0
Technicians & Associate Professionals	1.1	0.2	0.2	0.0
Clerical & Admin workers	0.1	0.1	0.0	0.0
Skill & Trade	8.4	5.6	5.8	6.2
Farmers & Fishermen	81.1	92.6	86.7	91.5
Craft and Related trades workers	5.4	0.8	2.4	0.7
Plant & Machine Operators	0.3	0.0	2.4	0.1
Elementary Occupations	2.1	0.4	2.0	1.5

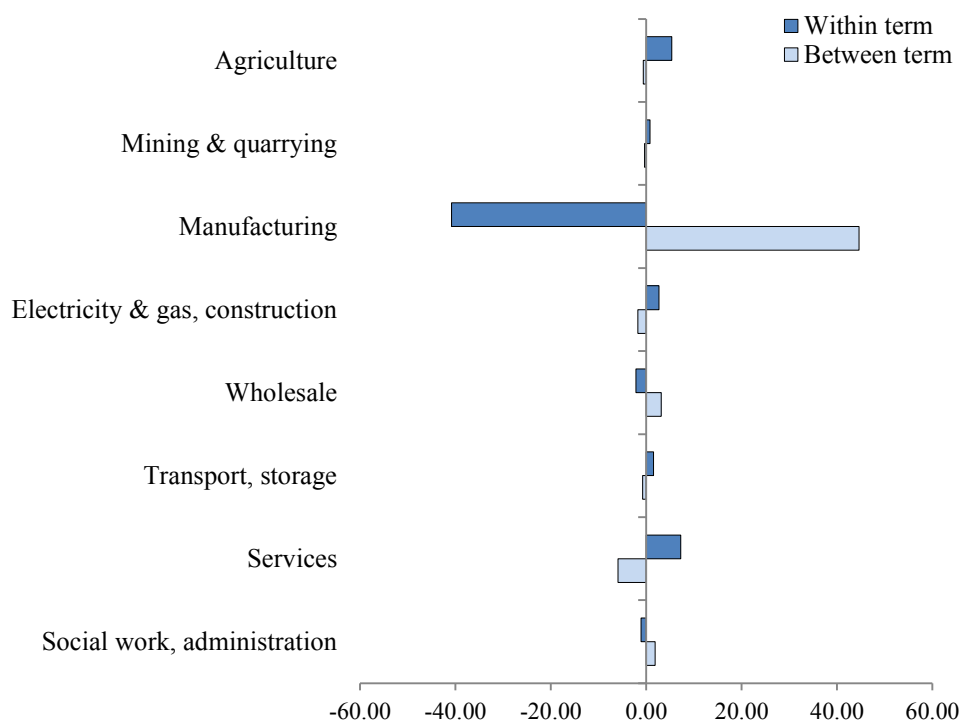
Source: 2004/2005 IFTRAB and 2008/2009 IOF data.

Table A6: Occupational distribution of non-vulnerable employment (%)

	2004		2008	
	Male	Female	Male	Female
Armed forces	0.5	0.0	1.4	0.0
Managers & Senior officials	2.2	1.6	1.5	2.4
Professionals	2.4	3.1	3.4	7.5
Technicians & Associate Professionals	11.5	16.5	5.2	8.4
Clerical & Admin workers	5.6	10.9	4.5	13.5
Skill & Trade	15.7	21.6	22.5	29.0
Farmers & Fishermen	10.7	5.4	13.7	15.8
Craft and Related trades workers	19.3	2.3	19.5	1.8
Plant & Machine Operators	7.6	1.5	11.8	3.9
Elementary Occupations	24.4	37.2	16.5	17.8

Source: 2004/2005 IFTRAB and 2008/2009 IOF data.

Figure A2: Breakdown of labour productivity growth, 2002-2004, per cent



Source: Data on employment are from the 2002/2003 IAF and IFTRAB 2004/05 surveys.

Figure A3: Breakdown of labour productivity growth, 2004-2008, per cent

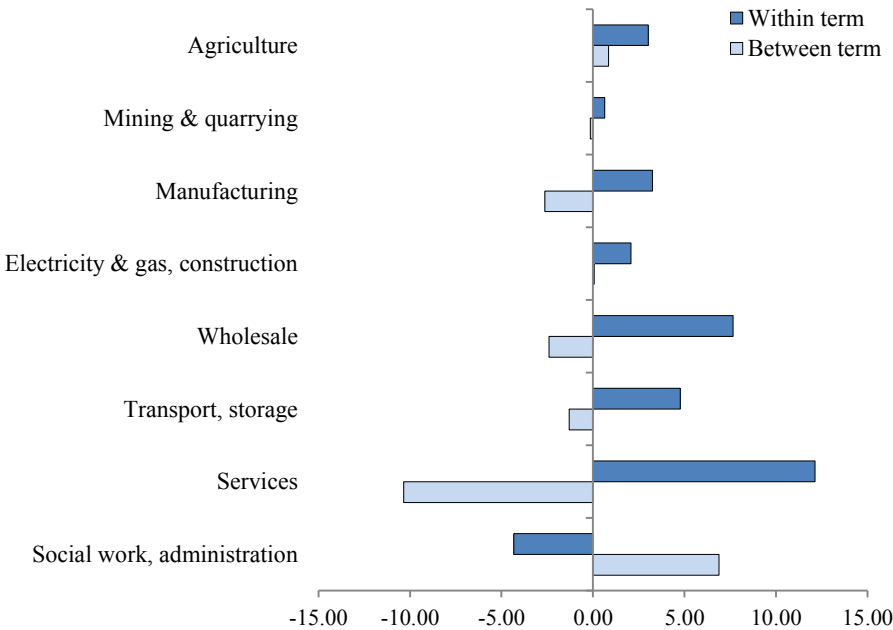
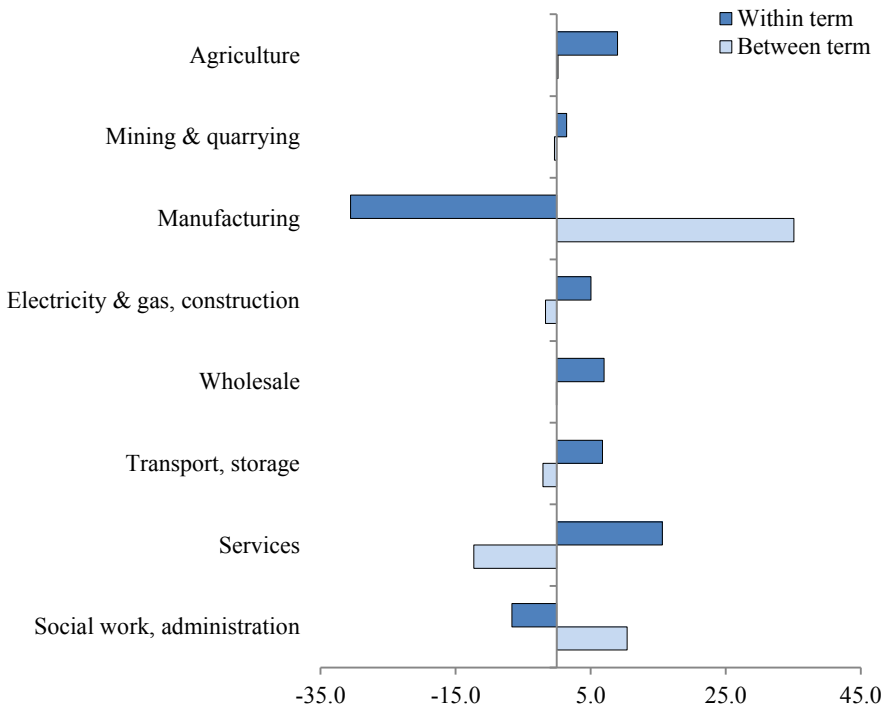


Figure A4: Breakdown of labour productivity growth, 2002-2008, per cent



Source: Data on employment are from the IAF 2002/2003, IFTRAB 2004/05 and IOF 2008/09 surveys; gross value added data by sector at constant 2003 prices - Metical is obtained from UN National Accounts database.

Table A7: Descriptive statistics of the main variables

Variables	Description	2004		2008	
		Mean	Standard Err.	Mean	Standard Err.
logearn	Log of hourly earnings	1.938	0.031	2.431	0.035
school	Number of years in schooling	7.445	0.110	8.009	0.117
exp	Potential experience	21.175	0.225	22.432	1.152
expsq	Potential experience squared	607.026	12.124	2338.865	1081.749
female	=1 if female	0.237	0.008	0.229	0.009
urban	=1 if urban areas	0.751	0.015	0.731	0.020
rural	=1 if rural areas	0.249	0.015	0.269	0.020
none_edu	=1 if no education	0.084	0.008	0.065	0.007
primary	=1 if primary education	0.531	0.012	0.483	0.015
secondary_~1	=1 if lower secondary education	0.197	0.008	0.237	0.009
secondary_~2	=1 if higher secondary education	0.138	0.008	0.145	0.008
higher	=1 if tertiary education	0.050	0.005	0.069	0.007
married	=1 if married	0.732	0.008	0.674	0.012
single	=1 if single	0.236	0.008	0.214	0.011
divorced	=1 if divorced	0.032	0.003	0.112	0.007
public	=1 if in government sector	0.308	0.012	0.285	0.012
second_active	=1 if second activity	0.111	0.007	0.188	0.012
<i>Sample size</i>		4990		4069	

Source: 2004/2005 IFTRAB and 2008/2009 IOF data.

Table A8: Returns to education in 2004: years of schooling

	All sectors	All sectors	Agriculture	Manufacturing	Mining and construction	Services
Schooling	0.2080*** (53.98)	0.2095*** (54.62)	0.0818*** (5.23)	0.1810*** (13.83)	0.1422*** (9.15)	0.2326*** (52.59)
Age	0.0561*** (17.89)	0.0561*** (17.83)	0.0421*** (4.65)	0.0652*** (6.86)	0.0628*** (5.90)	0.0530*** (14.22)
Age squared	-0.0006*** (-9.43)	-0.0006*** (-9.48)	-0.0006*** (-3.92)	-0.0008*** (-4.64)	-0.0008*** (-3.86)	-0.0004*** (-5.90)
Female		-0.1731*** (-6.99)				
Urban		-0.0539 (-1.51)				
Constant	-0.4606*** (-9.44)	-0.3765*** (-6.82)	0.4143*** (2.81)	-0.2623* (-1.67)	0.2239 (1.29)	-0.7119*** (-12.34)
<i>N</i>	4683	4683	358	574	428	3344
<i>R</i> ²	0.471	0.477	0.120	0.376	0.263	0.530

Notes: *t* statistics in parentheses * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$.
Source: Authors' calculations using data from the IFTRAB 2004/2005.

Table A9: Returns to education in 2008: years of schooling

	All sectors	All sectors	Agriculture	Manufacturing	Mining and construction	Services
Schooling	0.1556*** (28.97)	0.1531*** (28.01)	0.0736*** (3.68)	0.1155*** (7.38)	0.0903*** (5.05)	0.1802*** (27.53)
Age	0.0226*** (14.06)	0.0223*** (13.87)	0.0114** (2.44)	0.0507*** (3.71)	0.0690*** (5.50)	0.0248*** (12.62)
Age squared	-0.0000*** (-13.71)	-0.0000*** (-13.57)	-0.0000*** (-2.62)	-0.0007*** (-2.61)	-0.0009*** (-3.40)	-0.0000*** (-12.24)
Female		0.0186 (0.50)				
Urban		0.1198*** (2.64)				
Constant	0.8195*** (11.75)	0.7407*** (9.71)	1.4091*** (7.37)	0.8548*** (3.87)	1.0126*** (5.03)	0.5419*** (5.99)
<i>N</i>	3335	3335	285	423	448	2281
<i>R</i> ²	0.259	0.261	0.070	0.149	0.148	0.303

Notes: *t* statistics in parentheses * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$.

Source: Authors' calculations using data from the IOF 2008/09.

Table A10: Returns to educational levels in 2004

	All sectors	All sectors	Agriculture	Manufacturing	Mining and construction	Services
Primary	0.4082*** (8.64)	0.3872*** (8.30)	0.0494 (0.50)	0.3202*** (2.78)	0.1895 (0.88)	0.4998*** (8.37)
Secondary_ESG1	1.1570*** (22.17)	1.1426*** (22.13)	0.6664*** (4.17)	0.8785*** (6.32)	0.6829*** (2.89)	1.3338*** (20.74)
Secondary_ESG2	1.9349*** (35.35)	1.9200*** (35.22)	1.5426*** (5.47)	1.7216*** (10.32)	1.4543*** (6.19)	2.0941*** (31.43)
Tertiary	2.9071*** (42.49)	2.9002*** (42.50)	1.8202*** (19.58)	3.0511*** (14.47)	2.5682*** (9.56)	3.0626*** (38.75)
Age	0.0595*** (20.00)	0.0594*** (20.01)	0.0397*** (4.50)	0.0604*** (6.80)	0.0600*** (5.76)	0.0593*** (16.60)
Age squared	-0.0007*** (-12.93)	-0.0007*** (-13.12)	-0.0006*** (-4.07)	-0.0008*** (-5.22)	-0.0008*** (-4.25)	-0.0006*** (-9.32)
Female		-0.2125*** (-9.04)				
Urban		0.0278 (0.81)				
Constant	0.2633*** (4.68)	0.3184*** (5.22)	0.7265*** (5.08)	0.5231*** (3.33)	0.8609*** (3.62)	0.0682 (0.99)
<i>N</i>	4683	4683	358	574	428	3344
<i>R</i> ²	0.511	0.519	0.185	0.436	0.309	0.558

Notes: *t* statistics in parentheses * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$.

Source: Authors' calculations using data from IFTRAB 2004/2005.

Table A11: Returns to educational levels in 2008

	All sectors	All sectors	Agriculture	Manufacturing	Mining and construction	Services
Primary	0.2959*** (3.34)	0.2573*** (2.91)	-0.2397 (-1.47)	0.4441** (2.34)	-0.1075 (-0.43)	0.6086*** (4.90)
Secondary_ES G1	0.6981*** (7.64)	0.6524*** (7.13)	0.0799 (0.35)	0.7480*** (3.61)	0.0186 (0.07)	1.0623*** (8.38)
Secondary_ES G2	1.2927*** (13.79)	1.2423*** (13.25)	0.8711*** (3.10)	1.3304*** (5.79)	0.7142** (2.49)	1.6180*** (12.54)
Tertiary	2.0821*** (20.16)	2.0341*** (19.67)	1.6738*** (5.11)	1.8355*** (4.91)	1.7098*** (4.45)	2.4018*** (17.56)
Age	0.0195*** (12.35)	0.0190*** (12.07)	0.0070 (1.60)	0.0477*** (3.43)	0.0579*** (4.73)	0.0216*** (11.18)
Age squared	-0.0000*** (-12.45)	-0.0000*** (-12.18)	-0.0000* (-1.75)	-0.0007** (-2.58)	-0.0008*** (-3.15)	-0.0000*** (-11.11)
Female		-0.0448 (-1.23)				
Urban		0.1796*** (4.01)				
Constant	1.4957*** (15.42)	1.4026*** (13.69)	1.9669*** (10.02)	1.1604*** (4.87)	1.7942*** (6.57)	1.1341*** (8.39)
<i>N</i>	3335	3335	285	423	448	2281
<i>R</i> ²	0.289	0.293	0.154	0.156	0.212	0.319

Notes: *t* statistics in parentheses * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$.
Source: Author's calculations using data from the IOF 2008/09.

Annex B: The Mozambique education system

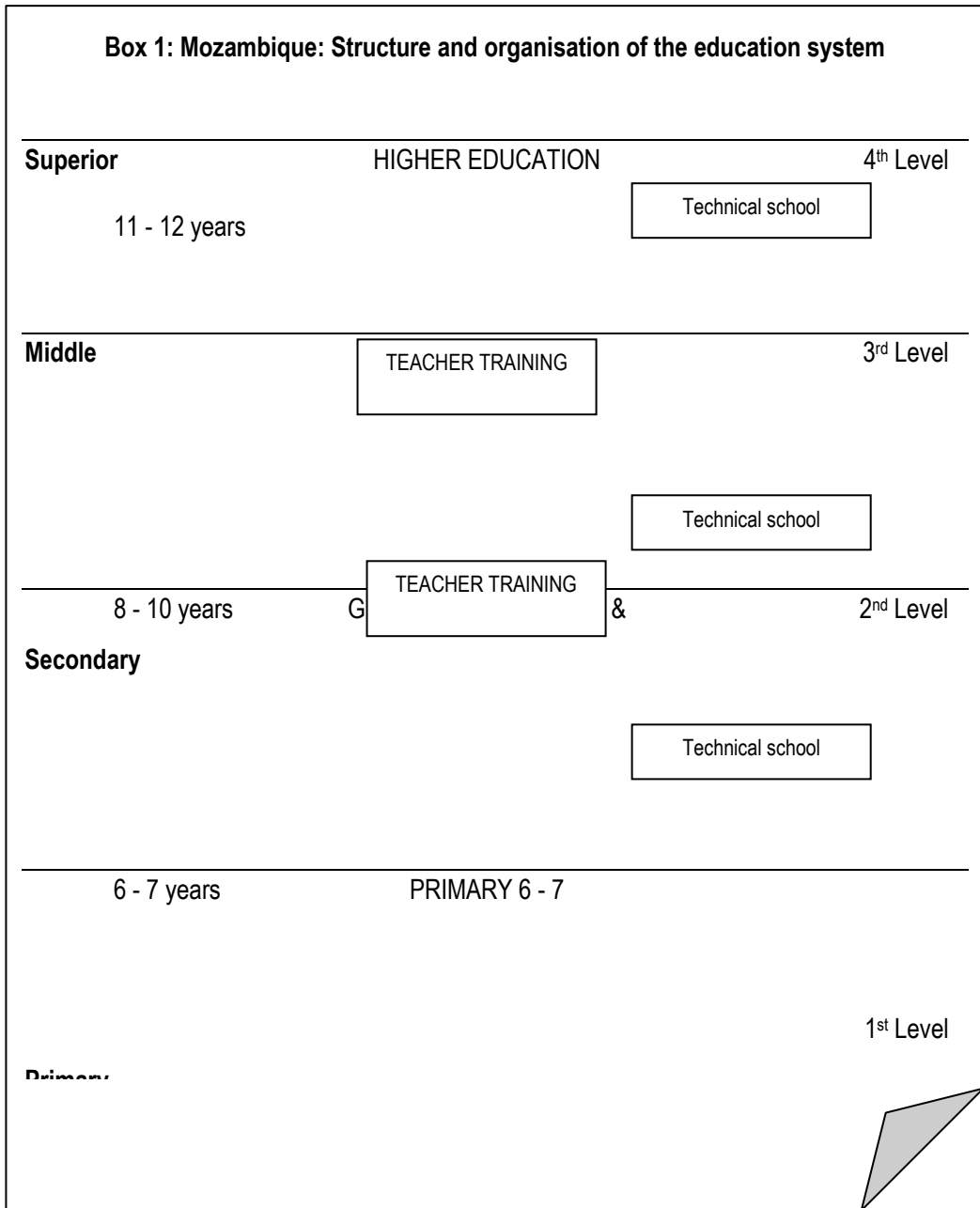
The structure of the current education system generally follows the framework introduced in 1983, when by law the National education System was established. Some changes were made in 1992 with the approval of Law No. 6/92 (*Diploma Ministerial* no. 6/92), although this law reaffirmed the same basic principles. The law acknowledges the importance of interventions of other entities in education, namely community organisations, cooperatives and the private sector. This law, however, does not determine education as being compulsory and free at all levels.²¹

The National education system in Mozambique includes pre-school education, primary education, secondary education and technical and vocational education (See Box 1 for more details). Official entry age in primary education is 6 years. Pre-school education has two levels: the first is the nursery level which covers children from birth to two years old. The second is kindergarten which takes children aged between three and five years old. With regards to school education in Mozambique, general education forms a component which is divided into two levels, primary and secondary education. Primary Education consists of seven grades and comprises two levels – the 1st level (EP1) covers grades 1 to 5 and the 2nd level (EP2) covers grades 6 and 7. Primary education is further divided into three learning cycles: the first cycle includes grades 1 and 2, the second covers grades 3, 4 and 5, and the third cycle covers grades 6 and 7.

Secondary education, the other component of school education, consists of parallel subsystems – general secondary education and secondary technical education. Secondary education has five grades divided into two learning cycles. The first cycle, ESG1, runs from grades 8 to 10, and the second cycle, ESG2, covers grades 11 and 12. Technical and vocational education is taught to students who have completed at least 7th grade. After completing secondary education, students can progress to university, polytechnic, higher institutes, colleges or academies where they can follow a variety of study programmes. Higher education is taught to students who completed the 12th grade or the Medium Technical education and lasts 3 to 4 years. Trainee teachers are required to study for four years and are trained in at least two disciplines (Gondwe, 2011).

²¹ Rather, the law assigns to the Council of Ministers the responsibility for determining the pace at which compulsory education should be introduced, taking into account socioeconomic developments in the country.

Box 1: Mozambique: Structure and organisation of the education system



Source: World Bank (2010).

Annex C: Summary of methods used in the study

C1. Breakdown of change in the employment-to-population ratio

Figure 6 provides estimates of the contribution of each sector to change in aggregate employment-to-population ratio (EPR). Change in the EPR is decomposed by using the following formula:

$$EPR_t - EPR_0 = \sum_i (EPR_{it} - EPR_{i0})$$

Where:

$EPR_t = E_t / L_t$ is EPR at time t ;

E_t is total employment;

L_t is working age population;

$EPR_{it} = E_{it} / L_t$ is the ratio of employment in sector i to working age population.

Thus, the term $EPR_{it} - EPR_{i0}$ captures the percentage point contribution of change in employment in sector i to total change in EPR. A low national EPR ratio suggests that a significant proportion of the population that could be working is not in employment. This may be due to high unemployment or inactivity (e.g., discouraged workers or students). The indicator can be disaggregated by specific population characteristics (e.g., gender and age) to provide useful insights on disparities in the access to employment opportunities.

C2. Breakdown of productivity growth

Labour productivity growth can be decomposed into the following components: a) *within sector term*, which captures the growth of productivity within given sectors and b) *between term* that captures the contribution of changes in the pattern of employment across sectors to productivity growth. Labour productivity at time t is given as:

$$A_t = \frac{Y_t}{E_t} = \sum_i \frac{Y_{i,t}}{E_t} = \sum_i \frac{Y_{i,t}}{E_{i,t}} \frac{E_{i,t}}{E_t}$$

Where Y_t is total gross value added, E_t is total employment, $Y_{i,t}$ is output of sector i and $E_{i,t}$ is employment in sector i . The growth rate of aggregate productivity can be decomposed using the following relationship:

$$(1) \frac{A_t - A_0}{A_0} = \frac{\sum_i \left(\frac{Y_{i,t} E_{i,t}}{E_{i,t} E_t} \right) - \sum_i \left(\frac{Y_{i,0} E_{i,0}}{E_{i,0} E_0} \right)}{\sum_i \left(\frac{Y_{i,0} E_{i,0}}{E_{i,0} E_0} \right)} =$$

$$(2) \frac{\sum_i \left(\frac{Y_{i,t}}{E_{i,t}} - \frac{Y_{i,0}}{E_{i,0}} \right) \frac{E_{i,t}}{E_t}}{\sum_i \left(\frac{Y_{i,0} E_{i,0}}{E_{i,0} E_0} \right)} + \frac{\sum_i \left(\frac{E_{i,t}}{E_t} - \frac{E_{i,0}}{E_0} \right) \frac{Y_{i,0}}{E_{i,0}}}{\sum_i \left(\frac{Y_{i,0} E_{i,0}}{E_{i,0} E_0} \right)}$$

Where the first term in (2) captures the within-sector effect and the second term captures the between effect. The within sector effect is due to the difference between sectoral value-added growth and employment growth (or sectoral productivity growth), weighted by the employment share of the sector which is held constant. A positive within-sector effect results when sectoral value added grows faster

than sectoral employment. The between effect is due changes in sectoral employment shares, weighted by sectoral productivity which is held constant. Positive between effect results when sectoral employment shares increase.

The United Nations (UN) Statistics Division is the source of value-added by industry data²² and household income and expenditure surveys are the source of employment data. Employment and value-added data are matched, resulting in the following sector breakdown:

1. Agriculture, hunting, forestry, fishing
2. Mining, utilities
3. Manufacturing
4. Electricity, gas, water supply
5. Wholesale and retail trade, restaurants and hotels
6. Transport, storage, communication
7. Services (financial intermediation, renting and business activities)
8. Public administration, social work, education, health.

To further facilitate comparison, the results for industry as a whole (the sum of sectors 2-4) and for the services as a whole (the sum of sectors 5-8) is presented.

C3. Breakdown of education intensity

Shift-share breakdown used for the analysis of education intensity is analogous to the method used for decomposing the growth of labour productivity. Education intensity at time t is defined as:

$$I_t^\gamma = \frac{E_t^\gamma}{E_t} = \sum_i \frac{E_{i,t}^\gamma}{E_t} = \sum_i \left(\frac{E_{i,t}^\gamma E_{i,t}}{E_{i,t} E_t} \right)$$

Where $E_t^\gamma = \sum_i E_{i,t}^\gamma$ the number of workers with is at least γ level of education, E_t is total employment, $E_{i,t}^\gamma$ is the number of workers with at least γ level of education in sector i , and $E_{i,t}$ is employment in sector i . Percentage point change in education intensity is decomposed by using the following relationship:

$$(1) \quad I_t^\gamma - I_0^\gamma =$$

$$(2) \quad \sum_i \left(\frac{E_{i,t}^\gamma E_{i,t}}{E_{i,t} E_t} \right) - \sum_i \left(\frac{E_{i,0}^\gamma E_{i,0}}{E_{i,0} E_0} \right) =$$

$$(3) \quad \sum_i \left(\frac{E_{i,t}^\gamma}{E_{i,t}} - \frac{E_{i,0}^\gamma}{E_{i,0}} \right) \frac{E_{i,t}}{E_t} - \sum_i \left(\frac{E_{i,t}}{E_t} - \frac{E_{i,0}}{E_0} \right) \frac{E_{i,0}}{E_0}$$

Where the first term in (3) captures the *within effect* and the second term captures the *between effect*.

C4. Estimating the impact of qualification mismatch on earnings

Individual earnings are modelled to identify the effect of under and over-qualification on the level of earnings, controlling for some observed individual characteristics. For this purpose, a log-linear Mincer's regression model can be extended as follows:

$$\ln Y_s = c + rS + aE + aE^2 + \sum d_i X_i + f_1 \cdot UNDER + f_2 \cdot OVER + u$$

Where X_i covers observable demographic characteristics; $UNDER$ is a dummy variable taking the value 1 if the individual is estimated to be under-qualified based on the mean statistical

²²The series based on the UN Statistics Division (current local currency unit) are deflated by using WDI Consumer Price index (2005=100).

method and 0 otherwise; *OVER* is a dummy variable taking the value 1 if the individual is estimated to be over-qualified and 0 otherwise;

C5. Returns to education

Returns to education are computed by estimating traditional Mincerian specification. In particular, a standard Ordinary Least Squares linear regression model is utilised, where the dependent variable is the natural logarithm of hourly earnings and the independent variables include full range of personal, regional and job related characteristics. Since the Mincerian earnings equation is a log-linear transformation of an exponential function, coefficients have a semi-elasticity interpretation, i.e. the percentage change of the independent variable for any percentage change of the independent variable.

Thus, we estimate an equation of the form:

$$(1) \ln(w_i) = \alpha + \beta_s S_i + X_i \delta + \varepsilon$$

Where $\ln(w_i)$ represents the natural logarithm of hourly earnings, S_i is years of obtained schooling, X_i is a vector of individual and workplace characteristics included in the analysis; β_s is the coefficient, which measures the rate of return to one additional year of schooling, and $\varepsilon \sim N(0, \sigma^2)$ is the error term. In the case of returns to different levels of schooling the model above is modified to the following:

$$(2) \ln(w_i) = \alpha + \sum_k \beta_k S_{k,i} + X_i \delta + \varepsilon$$

Where S_k is a vector of dummy variables identifying the education level k held by the individual (first level primary, second level primary, and secondary education with the base category being with no education). Hourly earnings are defined as reported monthly earnings in the main job divided by 4.34 and then divided by reported weekly hours of work. Potential experience is estimated as *age-6-years of schooling*.

Exclusion of individuals who do not report wages accounts for a substantial reduction in sample sizes. Our final working sample consists of 4,989 individuals in 2004 and 4,038 individuals in 2008. The descriptive statistics of the resulted samples are reported in Table A7. For the period 2004-2008 the percentage of working individuals with upper and higher secondary education increased, while the proportion of those with primary decreased from 53 per cent in 2004 to 48 per cent in 2008. The descriptive statistics also show that the samples are strongly male dominated. Around 77% of workers in the samples are males. Public sector employment (which includes government and public enterprises) accounted for around 31 per cent of total employment.

Annex D: Data

The analyses in this paper are carried out using data from the Mozambique Household Survey (Inquérito aos Agregados Familiares, IAF 2002/03), the Mozambique Labour Force Survey (Inquérito Integrado à Força de Trabalho, IFTRAB 2004/05) and the Household Expenditure Survey (Inquérito ao Orçamento Familiar, IOF 2008/09). The data collected in these three surveys share some common features. They indicate detailed household-level information about the labour supplied by each member – employment status, sector of activity, type of work performed, main source of income, and detailed information about household expenses. Information was collected both at household and individual level.

The IAF 2002/2003 sample covers 44,083 individuals distributed over 8,727 household, of which 4,020 are in urban areas and 4,707 in rural areas, and is based on a stratified random sample designed to be representative at national and provincial level, and by type of area (urban versus rural). The IFTRAB 2004/05 is the first post-independence labour force survey which contains detailed information on employment, unemployment, under-employment, sectors of economic activity of the labour force, earnings, number of hours worked, and also an additional section on child labour characteristics. The sample corresponds to 17,800 households, from which 17,151 households were interviewed at national level, being 8,681 in urban areas and 8,470 in rural areas (Muzima, 2007). Finally, the IOF 2008/09 is a large, nationally representative survey capturing socio-economic data for 10,832 households and 57,177 individuals. The survey was conducted between September 2008 and August 2009 across all Mozambican provinces. It is typically conducted every five years since it first started in 1997, and constitutes the official base data for monitoring and evaluation of the poverty rate in Mozambique.

Use of these surveys to derive labour market information is not without its challenges. There are some discrepancies in questionnaire design and subsequent coding among these surveys, which makes it difficult to derive consistent measures over time. In addition, many individuals in the survey reports have more than one job; results in this study are based on the main occupation of each working-age individual.

All summary statistics reported in the report are based on tabulation using survey weights provided in the data and considering the issues of stratification by different spatial regions in the country (see Muzima, 2007).

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