Jobs and Welfare in Mozambique

Country case study for the
2013 World Development Report

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world development report 2013

UNITED NATIONS UNIVERSITY

WORLD INSTITUTE FOR DEVELOPMENT ECONOMICS RESEARCH

(UNU-WIDER)

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15 August 2012

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Preface

The 2013 World Development Report (WDR13), to be launched in October 2012, will focus on jobs and development. The WDR13 will articulate a framework which places jobs at the center of development, considers the dynamic links between growth strategies and jobs, and provides analytical tools to think about policies and programs from a jobs perspective. The framework combines insights from poverty work, studies on job creation and destruction, and the social development literature to show that jobs are transformational across three important dimensions of development: living standards, productivity and social cohesion. It will in particular make the case that these three dimensions play out differently depending on a country's context and priorities, implying a diversity of jobs agendas across the developing world.

An integral part of the preparation of the WDR13 is the preparation of in-depth case studies analyzing the nature of the jobs challenges across a range of country situations. The typology considered includes: agrarian economies, conflict-affected countries, resource-rich countries, urbanizing countries, societies with high youth unemployment, formalizing countries, and aging societies. Mozambique was selected by the World Bank team to illustrate the situation of mainly agrarian economies, where progress in poverty reduction is unlikely to happen without substantial gains in agricultural productivity (and especially in smallholder farming) but where rapid growth and integration in the world economy will almost certainly involve urban jobs (and especially wage employment). Such tensions imply that the following four questions are critical:

- What are the jobs that will contribute the most to poverty reduction, productivity growth and social cohesion?

- Are there trade-offs between these transformations and if so how can they be addressed?

- What are the obstacles to the creation of more "good jobs" from a development perspective?

- Which policies could contribute to the removal of those obstacles?

In January of 2012, the Director of the WDR13 Martin Rama approached UNU-WIDER and requested that UNU-WIDER lead the preparation of the Mozambique case study. We were delighted to be able to respond positively, and it is a great pleasure to present herewith the Mozambique case study, which was prepared within the framework of the Research and Communication on Foreign Aid (ReCom) programme supported financially by Danida and Sida.

Principal thanks for collaboration in preparing this study go to Finorio Castigo, Fausto Mafambissa, Noemia Nhatsave and David Rosenfeld of the Direcção Nacional de Estudos e Análise de Políticas (DNEAP), Ministério de Planificação e Desenvolvimento (MPD), República de

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1 Introduction

This study examines the nature and functioning of the labour market in Mozambique. There is little disagreement that the country has achieved remarkable success over recent decades, particularly when viewed at the aggregate level. Over nearly 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. Future prospects for the economy are also strong due to investments and new discoveries in the natural resources sector (principally coking coal, thermal coal and natural gas). These will potentially turn Mozambique into a significant global player in these commodities over the next couple of decades.

However, the country's development record in not unblemished. In particular, there is growing evidence that macroeconomic success has not delivered unambiguous socio-economic benefits at the household level. Mozambique remains one of the poorest countries in the world, ranked on the UNDP's 2011 Human Development Index at 184 out of 187 countries, below so-called failed states such as Haiti (158), Afghanistan (172) and the Central African Republic (179). It is also increasingly recognized that Mozambique's growth has become less pro-poor over time, meaning that consumption poverty rates have remained persistently high (DNEAP, 2010; Arndt et al., 2012). This is especially true in the rural sector, suggesting a widening urban-rural gap and upward pressure on income inequality. Social tensions have also been rising, spilling over into isolated incidences of unrest, and reflecting concerns over the high cost of living in urban areas as well as a scarcity of good quality employment opportunities.

It is precisely this tension between growth and inequality that motivates a closer examination of trends in Mozambique's labour market. A key determinant of the extent to which macroeconomic growth produces gains in social welfare is the quality of jobs that an economy generates. Where productivity is increased by reallocating workers from lower to higher productivity activities, by adopting new technologies and practices in laggard sectors, or by creating new jobs in higher productivity sectors (and thus absorbing under-employed labour), we should expect growth to have a strong positive effect on individual and social welfare.

In light of the above, this study seeks to shed light on four main questions:

- What has happened to jobs (the labour market) in Mozambique over the past 15 years?

- What has been the nature of the link between jobs and (social) welfare?

- Where should Mozambican policymakers focus to create more good jobs?

- What are the risks to achieving these policy objectives?

The rest of the study is structured as follows: Section 2 addresses some preliminary issues of labour market definitions and the sources of evidence used to analyse the Mozambican labour market. Household surveys (micro-data) are the most reliable and comprehensive source and one contribution of this study is to place a series of four nationally representative household surveys on a consistent basis for the purpose of deriving coherent labour market information. Section 3 goes on to introduce the case of Mozambique with a brief review of recent economic performance. This sets the scene for Section 4, which describes broad trends in the Mozambican labour market over the period 1996-2009. We do so by presenting 10 stylized facts. These reveal that rapid macroeconomic growth has not been accompanied by transformation of the labour market. Rather, it remains dominated by (low productivity) rural agricultural workers. Put differently, the economy has failed to generate sufficient high quality jobs that effectively translate macroeconomic growth into welfare gains.

The remaining sections of the study investigate the connection between jobs and welfare more formally. The fundamental analytical question is whether the limited transformation in jobs is merely symptomatic of challenges in other domains (such as insufficient capital accumulation), or rather is a core reason for the persistence of poverty. This might be the case if labour market imperfections led to very severe factor mis-allocations. To orient the analysis, Section 5 sets out a simple theoretical framework to understand how labour market processes might condition observed welfare outcomes. Where labour market imperfections, such as rationing are at play, households can be constrained to pool all labour into single activities, despite the fact they (hypothetically) could achieve higher utility from some alternative allocation. This provides a direct link to models of labour market sorting (or selection), configured at the household level, and suggests that where labour market imperfections are at play there may be large differences in labour's marginal product between labour market segments.

The framework motivates three specific empirical questions which are taken to the data in Section 6. We classify households into discrete labour market segments (described as 'jobs portfolios') based on the type of labour activity undertaken. In turn we show these portfolios follow a clear (aggregate) welfare ranking with exclusively agricultural jobs being first-order dominated by all jobs. We then model the determinants of entry into these portfolios and the determinants of household consumption (our welfare metric), conditional on these prior labour market selection processes. The results indicate that agriculture is a residual or default choice, driven by very low household endowments and an absence of outside opportunities (demand-side effects). There are large differences in returns to human capital between labour market segments, but also evidence of very low returns to small numbers of years of schooling (sub-primary) across most activities.

Section 7 brings the analysis closer to policy, and simulates a range of stylized jobs scenarios. These show that the likely welfare benefits associated with removing labour market imperfections,

which appear to originate on the demand-side, are material but not transformational. The argument is that factor endowments are crucial to observed welfare differences and unskilled labour yields low returns across the economy. Consequently, raising returns in agriculture is a priority response, particularly given the volume of employment it represents as well as the rapid population growth that is adding more than 300,000 potential workers to the Mozambican workforce each year. Section 8 focusses explicitly on the pro-jobs policy challenges and objectives that come out of this analysis. Section 9 concludes.

2 Definitions and data

2.1 Labour market concepts

The sheer number and variety of concepts used to define the labour market and measure its constituent objects can be bewildering. This is particularly the case in developing countries where formal wage labour tends to be the exception, not the rule. Thus, before proceeding to the case of Mozambique, it is helpful to clarify some of the main concepts that will be employed in this study. At a broad level, many of these concepts are well-established and standardized definitions can be found elsewhere.[1] Nonetheless, at the country level, specific aspects of individual concepts frequently differ, and it is therefore important to be aware of these nuances so as to interpret results correctly.

An appropriate starting point in any discussion of the labour market is a definition of the active labour force or economically active population. This is a broad concept, which is somewhat easier to delimit with reference to what is excluded rather than specifically included. A first exclusion from the active labour force is members of the population that are not of working age. The working age population is defined here as all resident members of the population aged 15-64 (inclusive). These age limits are made for practical purposes, and should not be seen as overlooking the existence of child labour or the contribution of the elderly to production. Within the working age population, individuals who are neither engaged in nor seeking work are also excluded from the active labour force. What constitutes 'work' is itself not necessarily straightforward; however, a standard definition refers to labour supplied for the production of those goods and services recognised in the System of National Accounts.[2] Again this is wide-ranging, but a key exclusion is domestic activities such as childcare undertaken by (extended) family members. Therefore, working-age individuals fully and exclusively dedicated to such domestic activities fall outside the definition of economically active. Other exclusions from the active labour force are the long-term ill, the handicapped, full-time students and the 'discouraged', which refers to individuals that have ceased to actively seek employment opportunities and are presently inactive.

Table 1 provides a summary of the interrelations between some key labour market concepts. It indicates that the sub-group of labour market 'insiders' (the economically active) encompasses a wide variety of types of employment, with wage employment being one of many. Both self-employment outside the household as well as unpaid labour in productive household activities

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[1]The International Labour Organization (ILO) provides a wealth of information. For example, the definitions employed in its Key Indicators of the Labour Market (KILM) series are found here: `kilm.ilo.org/manuscript/`.

[2]For example, see the definition of economically active used in ILO's LABORSTA database: `laborsta.ilo.org/applv8/data/c1e.html`.

Table 1: Summary of labour market concepts

Labour force position	Employment type	Employment status
In the labour force (either economically active or seeking work)	Wage employed Self-employed Family / unpaid worker	Employed
	Unemployed	NEET
Out of the labour force (economically inactive and not seeking work)	Discouraged Inactive / housework	
	In education	Student

Notes: NEET refers to "Not in Employment, Education or Training".
Source: adapted from African Development Bank (2012).

such as agriculture, petty commerce or artisanship are included. All of these types of employment come under the general rubric of a 'job', used in this expansive sense hereafter. The table also suggests that a strict definition of unemployment, referring to individuals who are out of work but actively seeking employment, may represent only a narrow subgroup of the working age population. Broader definitions of unemployment have been suggested, which can be more relevant where employment is demand-constrained leading to large numbers of discouraged or involuntarily inactive individuals. One of these, shown in the table, is the NEET concept – Not in Employment, Education, or Training (see African Development Bank, 2012).

Aside from defining unemployment, for the present purposes it is arguably more useful to focus on differences in the quality of jobs. As Teal (2011); Fields (2011) *inter alia* note, in low income countries many people are just too poor not to engage in some form of work. Metrics of job quality can refer to myriad work characteristics, including the degree of contractual vulnerability, the number of hours worked, the nature and regularity of payments to labour services, as well as the real returns to these services. These characteristics are not easy to observe, and as a result tend not to be fully captured either by aggregate statistics or by detailed labour force surveys (in developing countries). Thus, without claiming to provide a robust definition of high versus low quality jobs, two simple quality-type distinctions are used herein. The first is between full- and under-employment, where the latter is defined in accordance with Mozambican official statistics, as working less than 40 hours per week. The second is between waged and unwaged jobs, where the former is generally taken to be of higher quality and located predominantly in the formal sector, yielding a greater degree of job security and better attending conditions than found elsewhere. Thus, what is labelled the informal sector is defined to be synonymous with self-employed and household jobs. This mapping from waged (unwaged, under-employed) to higher (lower) quality work is not watertight, and we appreciate that insecure, irregular and

informal forms of wage labour are found. However, as we will see for Mozambique (Section 6.1) and in keeping with evidence from other low income African countries (e.g., African Development Bank, 2012), access to waged work is strongly associated with higher welfare outcomes compared to other jobs on average.

An alternate perspective on job quality shifts attention from the private benefits of different jobs to their wider, social contribution. This view, developed in the forthcoming 2013 World Development Report, identifies three distinct domains in which jobs can yield positive externalities. These are: raising living standards for the poorest (reducing rates of poverty); raising productivity (particularly through job creation, destruction and reallocation, within and between sectors); and supporting collective values and beliefs, thereby contributing to social cohesion. A key concept is that of 'good jobs' which can be are defined as those which support increases in household expenditures over time, contribute to faster productivity growth at the aggregate level, or do more to foster social cohesion, in a particular country at a specific stage in its development process. That is, in addition to providing private benefits, good jobs can make a positive long-term social contribution and underpin an inclusive process of transformation and development. Admittedly, it may be somewhat easier to identify such good jobs in hindsight, as opposed to *ex ante*. Nonetheless the distinction between good and bad jobs provides a constructive framework to guide labour market analysis and inform policy debates.

Three final concepts used hereafter merit brief clarification. First, distinctions between different types of informal jobs are informative.[3] Particularly useful is the distinction between agricultural and non-agricultural activities which, in turn, leads us to distinguish 'non-farm household enterprises' – defined as the smallest scale of informal non-agricultural enterprise, typically operating within the confines of the household and employing one or more family members.[4] Scholarship has shown that such enterprises can constitute a crucial source of dynamism in both rural and urban areas of low income Africa (e.g., Cook, 1999; Gulyani and Talukdar, 2010; Fox and Pimhidzai, 2011), a perspective which is endorsed herein (see Section 6).

Second is the simple distinction between youth and adult members of the labour force. Following common practice, the former are represented by the 15-24 cohort, while adults are represented by the 25-64 cohort. Third, we also employ a standard distinction between aggregate economic sectors according to primary, secondary and tertiary activities. The former essentially refers to activities producing untransformed, primary goods such as in agriculture, fishing, forestry and mining. Secondary sectors refer to value-added transformative activities, principally in manufacturing and construction. The tertiary sector thus refers to a wide range of service-related activities, including transport and communications, commerce and the vast majority of public

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[3]For instance, see Fox and Kweka (2011) for a presentation and discussion of concepts used to describe the informal sector.

[4]Such enterprises also have been called (non-farm) nano- or micro-enterprises in the literature.

sector jobs.

2.2 Sources of data

The above concepts gain traction when consistently applied to reliable information about the labour force. This is a challenge in Mozambique (as elsewhere) due to data limitations. As noted in the Introduction (also see below Section 4, Stylized Fact 4), the size of the informal sector in both rural and urban areas renders official aggregate labour force statistics of limited value. Instead, it is necessary to assemble the chosen measures directly from micro-data. Survey datasets of this kind are available in Mozambique covering the period 1996 to 2009, but with gaps. Notably, however, no comprehensive or official work has been undertaken to derive consistent labour force information from these surveys over the full post-conflict period.[5] Thus, a first contribution of this study is to establish a consistent and detailed set of labour market data on Mozambique, from which key characteristics and trends can be determined.

With respect to the specific sources of micro-data, we rely primarily on the set of three nationally representative household surveys of the living standards variety. These are the two 'Inquéritos aos Agregados Familiares' (IAFs) of 1996/97 and 2002/03, and the 'Inquérito ao Orçamento Familiar' (IOF) of 2008/09. The data collected under these three surveys share some common features. They include detailed household-level information, basic information about the labour services supplied by each member (e.g., employment status, sector of activity, type of work performed), the main sources of income for the household, and detailed information about household expenses. Importantly, these surveys have also constituted the information base for Mozambique's official national poverty assessments (DNEAP, 2010) and thus enable a link to be made between jobs and welfare outcomes at the micro-level. In addition, we use the (one-off) dedicated labour force survey of 2004/05 (Inquérito à Força de Trabalho, IFTRAB) which collected more detailed information on labour force activity at the household level, but did not include complementary information on household expenses from which consumption poverty measures could be built. Despite the latter drawback, use of the IFTRAB represents a valuable cross-check on the labour market information derived from the living standards surveys, and also fills an important temporal gap in the overall micro-data series, thereby allowing us to identify trends with greater confidence.

Use of these surveys to derive labour market information is not without its challenges. Principal among these is a variety of discrepancies in questionnaire design (and subsequent coding), which makes it rather painstaking to derive consistent measures over time. In particular, the treatment

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[5]This is not to say that no labour force analysis has been undertaken in Mozambique. Examples include Fox et al. (2005); Brück and van den Broeck (2006). However, none of these studies provide the same coverage as here, either in terms of the number of household surveys or the extent of labour market information derived.

of family domestic work is problematic, in part because there is frequent straddling between domestic and productive work, especially where the household has access to agricultural assets. Suffice to say that whilst considerable effort has been made to place the surveys on a consistent footing, imperfections remain which implies non-sample error may be material in some instances. The conceptual challenge of how to deal with individuals that straddle different labour market positions is not exclusive to part-time domestic workers. Many individuals in the surveys report having more than one job. However, on grounds of practicality and simplicity, we only report results for the stated principal occupation of each working-age person. Despite these caveats, the surveys remain a rich resource.

In addition to the above, two very different sources of data are also used in the analysis. These serve to complement the assembled micro-data. The first is official annual national accounts statistics, including sector-specific measures of value added (real GDP at factor cost). These can be mapped to the derived labour force statistics, yielding aggregate measures of labour force productivity by sector over time (see Section 4, Stylized Fact 8). Such evidence on productivity is further corroborated by appealing to existing secondary sources, specifically metrics taken from analyses of (formal) enterprise and agricultural income surveys in Mozambique. Second, we use the series of AfroBarometer opinion surveys (conducted in Mozambique in 2002, 2005 and 2008) to shed light on the nature of links between jobs and social cohesion (see Section 4, Stylized Fact 10).[6] In sum, therefore, a wide range of primary and secondary evidence will be drawn upon to explore the job environment in Mozambique and how it has changed during the post-conflict period.

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[6]For an overview of the AfroBarometer surveys see Mattes (2009); also reference material can be found at www.afrobarometer.org.

3 Context

The introduction noted a tension in Mozambique's recent economic performance between aggregate success (stabilization and growth) and slowing poverty reduction. The former success story has been reviewed in detailed elsewhere (e.g., Fox et al., 2005; Jones, 2006; Arndt et al., 2007; Clement and Peiris, 2008). It can be substantiated by recourse to a set of simple graphics, based on official statistics. Figures 1 and 2 show the evolution of Mozambique's GDP over time since the beginning of the 1990s which coincided with the end of a prolonged period of conflict (a cease fire was agreed in 1992) and the first multi-party elections (held in 1994). Over this period real GDP growth averaged over 7%, which places Mozambique among the best performing countries in the world from the perspective of this single metric.

This success must be placed in context. On the one hand, Mozambique started its recovery from an incredibly low base. Based on any metric of development you may wish, conditions in the early 1990s were easily amongst the most challenging in the world. Thus, despite sustained aggregate progress, poverty remains widespread. This is shown in Table 2, which estimates population-wide consumption and asset poverty headcount rates from the series of household surveys described in Section 2. Two points can be highlighted. In 1996/97, slightly less than than 90% the population could be unambiguously classified as poor (being either asset or consumption poor). The most recent household survey puts the same figure at just above 80%, meaning that 4 out of every 5 members of the population remain poor by some metric. Second, looking at the share of the population who are poor on both metrics (the final row of the table), while this fell from 54% to 43% between 1996/97 and 2002/03, progress has slowed since then such that the difference between 2002/03 and 2008/09 is statistically negligible. As discussed at length in DNEAP (2010) (also Arndt et al., 2012, among others), a candidate explanation for this is stagnation of the smallholder agricultural sector, where most Mozambicans earn a living (see below). To give an example of the range of evidence that supports this conclusion, Figure 3 compares Mozambique's annual average maize yields (a primary staple) to that of other sub-Saharan African countries. It shows that Mozambican yields have been the lowest of the selected countries and have been without any discernible upward trend. As elaborated in later sections of this study, this represents a (if not the) major concern.

Looking to the future, it should be noted that Mozambique is presently entering a very new phase in its developmental trajectory. In large measure, initial post-conflict problems of reconstruction and stabilization have been overcome. The priority now is to ensure that economic growth not only remains robust bust also is more inclusive. Over at least the short term the former is not doubted. Multi-billion dollar investments in the natural resources sector have recently taken place (by multinationals), of which some will go to support infrastructure development (to export coal). Discoveries of large resources of natural gas also threaten to place Mozambique as

one of the top five global producers of liquefied natural gas within a decade. Thus, the principal policy challenge is to avoid a resource curse and ensure the benefits of this investment extend to non-extractive sectors and, thereby, 'good jobs' are created throughout the economy.

With this context in mind, we can now examine the present jobs landscape.

Table 2: Estimates of poverty evolution over time (% population)

	1996/97	2002/03	2008/09
Non-poor	12.83	14.75	19.32
Consumption poor (only)	14.36	11.61	14.33
Asset poor (only)	18.80	31.09	26.30
Asset and Consumption poor	54.01	42.55	40.05

Notes: consumption poverty refers to the official poverty estimates (see DNEAP, 2010), which follows a cost of basic needs approach; asset poverty is based on a multidimensional index of the Alkire and Foster (2011) type.
Source: authors' calculations from household survey series.
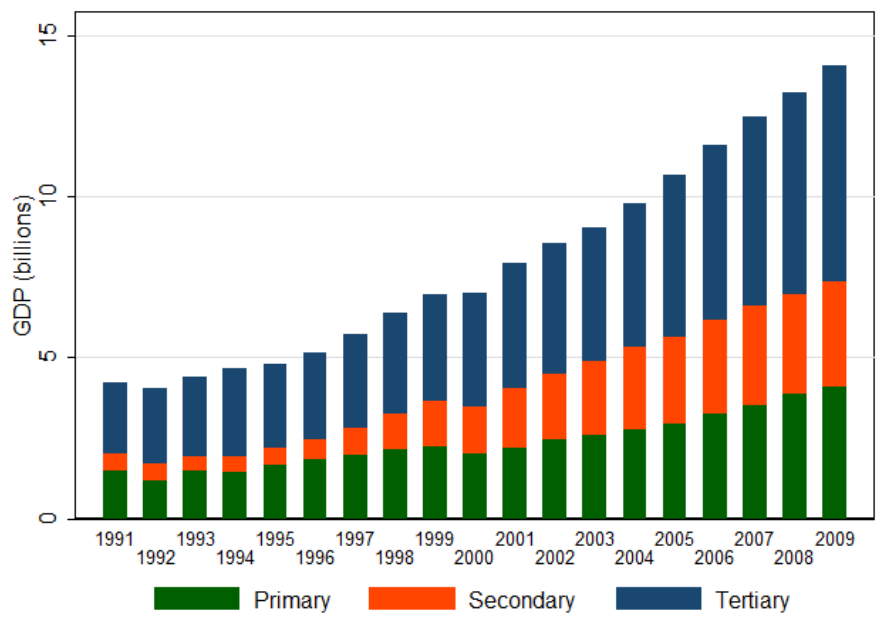
Source: authors' calculations, based on official public statistics.

Figure 1: GDP in billions of real US$, by major sector, 1991-2009
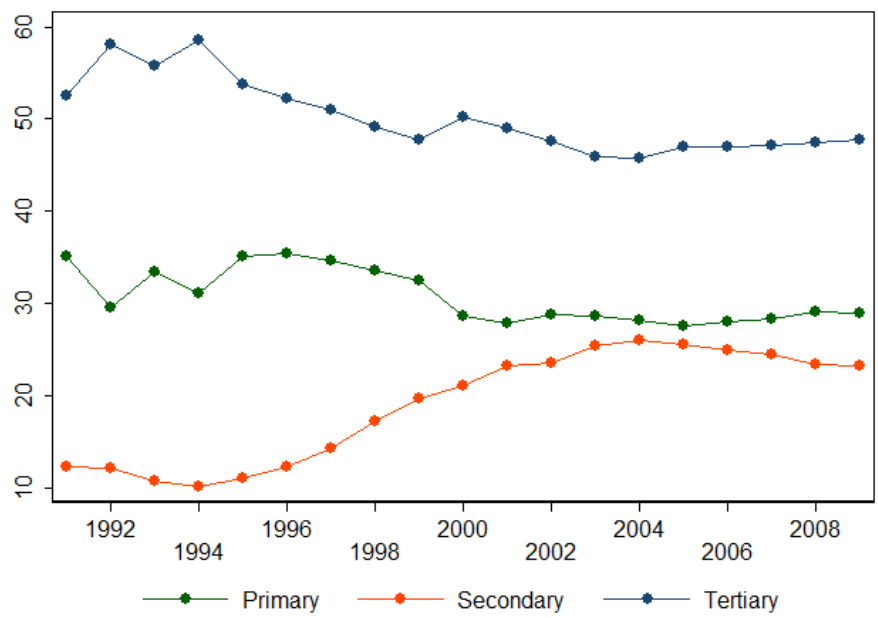
Source: authors' calculations, based on official public statistics.

Figure 2: Structure of aggregate value added (in %), by major sector, 1991-2009
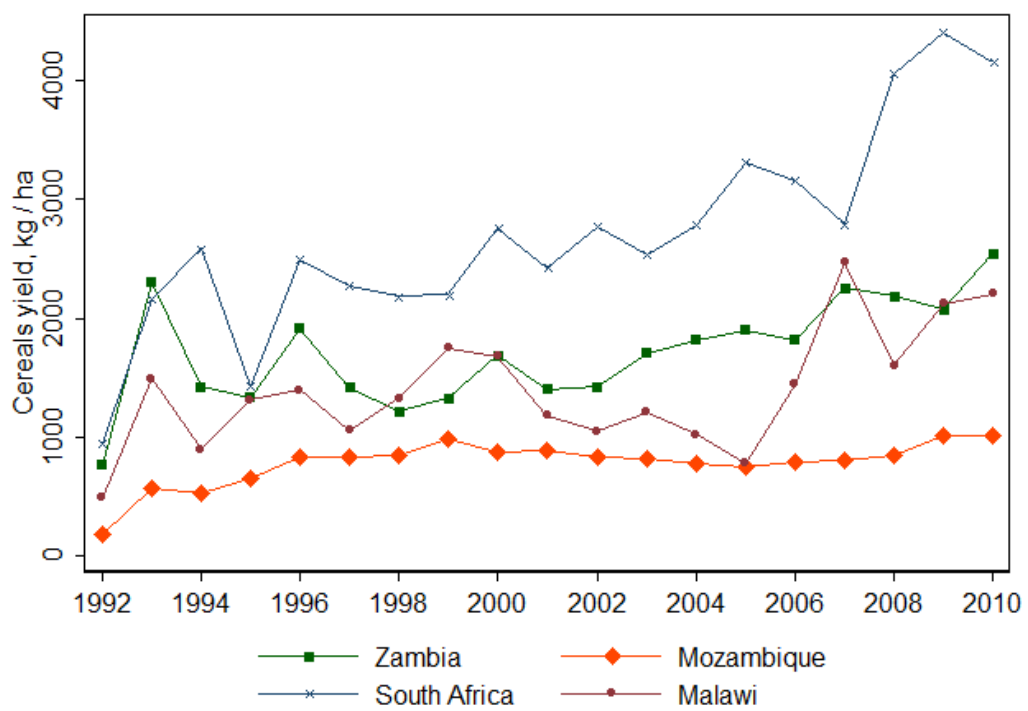
Source: World Bank, World Development Indicators (online, retrieved July 2012).

Figure 3: Yields of staple cereal crops (maize), kg/ha

4 Stylized jobs facts

The preceding tour of Mozambique's recent economic performance indicates something of a conundrum – how is it that rapid rates of economic growth have not (unambiguously) translated into sustained poverty reduction? This motivates a careful look at changes in the labour market. Thus, drawing on evidence from micro-data, the present section aims to characterise Mozambique's jobs situation starting in the early post-conflict period (1996/97) through to the most recent household survey of 2008/09. To do so, we present a set of 10 stylized facts that should be read as broad generalizations of the Mozambican labour market, which admittedly leave certain nuances and details aside.

Stylized Fact 1

> *Mozambique's population is young, rural and growing rapidly.*

A simple but fundamental starting point is the demographic structure of the work force. As Table 3 shows, presently a little under 50% of the population is of working age (but not necessarily working), meaning that there is more than one dependent to each potential worker. The population also remains largely located in rural areas, with an urbanization rate of approximately 30% which is low in global terms but not exceptional for low income African countries in which agriculture is a widespread occupation. Notably, the rate of urban growth appears to be relatively slow, meaning that the share of population residing in rural areas has remained broadly unchanged since 1996/97.[7] However, this is not because internal migration is unimportant. As the table indicates, some of the fastest growing population segments have been the urban youth and adult cohorts, evidently buoyed by in-migration from rural areas (particularly of young persons) which in turn has raised the dependency ratio in these areas to over 115%.

A critical implication of these demographic trends is that the working age population will continue to grow relatively rapidly over the next generation (30 years). Baseline simulations based on the UN's core population estimates for Mozambique indicate that the overall population growth rate is expected to be around 2.3% per annum (p.a.) over the period 2005-2050. However, the more rapid growth of the under 15 cohort that continues to take place now, in part linked to large reductions in infant mortality and improved health outcomes more generally, translates into expected increases in the working age population of approximately 2.7% p.a. over the same period. These estimates are illustrated in Figure 4. From now to 2040, Mozambique should plan for its working age population to at least double (see panel [a]). Put differently, the cohort

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[7]One reason for this may simply be due to the fact that the urban/rural classification used in the 1997 census was not updated for the 2007 census. As Cunguara et al. (2011a) note, based on an urban agglomeration index, urbanization has increased from 15 to 21 percent over the same period. Whatever the correct measure, the key point is that the degree of urbanization remains low.

Table 3: Demographic profile of Mozambique, population in '000s

		'96/97	'02/03	'04/05	'08/09	Δ/year
Urban	<15	2,101	2,520	2,516	3,069	*3.21*
	Youth	965	1,349	1,331	1,505	*3.78*
	Adult	1,376	1,847	1,893	2,245	*4.16*
	65+	93	148	98	156	*4.38*
	ALL	4,535	5,865	5,838	6,974	*3.65*
Rural	<15	5,045	6,007	6,100	7,712	*3.60*
	Youth	1,967	2,003	1,982	2,267	*1.19*
	Adult	3,654	3,990	4,042	4,794	*2.29*
	65+	309	398	225	493	*3.96*
	ALL	10,976	12,397	12,348	15,267	*2.79*
TOTAL		15,511	18,262	18,186	22,241	*3.05*
Depend. ratio (%)	Urban	93.7	83.5	81.0	86.0	*-0.72*
	Rural	95.2	106.9	105.0	116.2	*1.67*
	Total	94.8	98.7	96.6	105.7	*0.91*
Urban share (%)		29.2	32.1	32.1	31.4	*0.58*

Source: authors' estimates from household survey series.

of working age individuals will increase by 300,000 to 500,000 p.a. (on a net basis, see panel [b]). The stark policy challenge, which we come back to in Section 8, is that this mass of new entrants will need to be absorbed either by creating new jobs or by enrolments in training and education. Moreover, to the extent that growth in the working age population is skewed towards urban areas (as we find recently), urban housing and transport infrastructure will come under additional pressure.
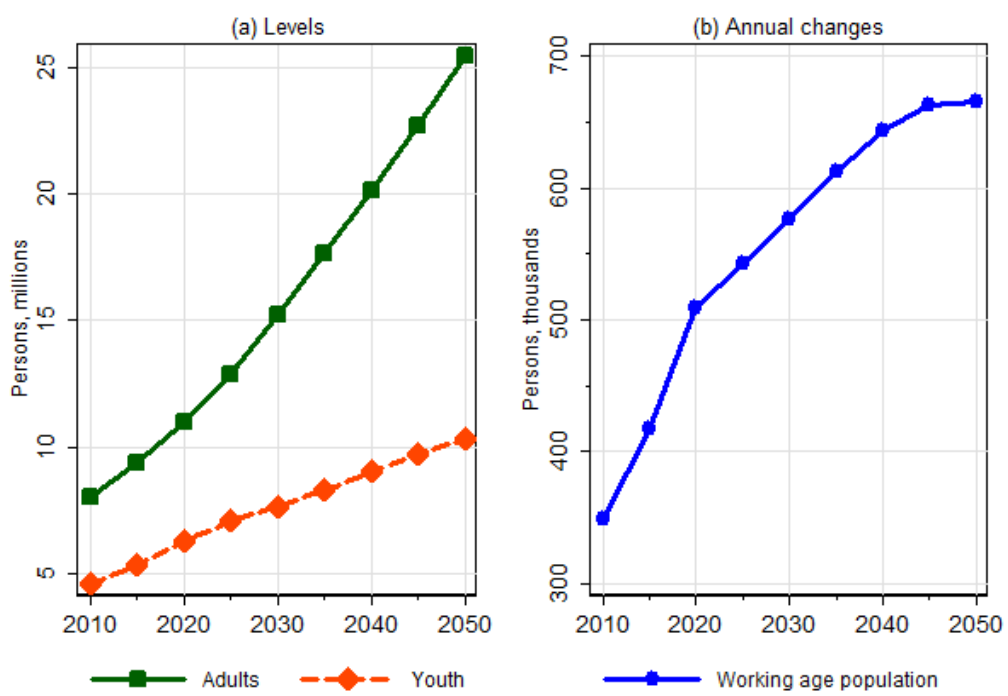
Source: authors' calculations, using Spectrum software.

Figure 4: Projected demographic trends in Mozambique, for adults (25-64) and youth (15-24) cohorts only

Stylized Fact 2

Rates of labour force participation are high; unemployment is low and principally confined to urban youths.

As is common in low income countries, where social security systems have very limited coverage, rates of labour force participation are high in Mozambique. That is, virtually everyone of working age is economically active. This can be seen from Table 4, from which three important patterns can be highlighted. The first is that participation rates are consistently higher in rural as opposed to urban areas, among both youth and adults. As also illustrated in Figure 5, only using data from the 2008 survey, this reflects both lower participation in (full-time) education, as well as almost non-existent rates of unemployment or NEET in rural areas. Second, participation rates of females are typically higher than (or at least as high as) that of males, except among adults located in urban areas which appears to be driven by domestic work rather than narrow unemployment (not shown). Nonetheless, even in urban areas around 80% of all adult women are economically active; thus, a key point is that female work is fundamental in the Mozambican labour market and even more so in rural areas. Third, while participation rates among men have remained broadly stable over the period of the surveys, female participation rates appear to have increased in urban areas. While it is possible this is driven by non-sample error in the 1996/97 survey, this pattern would be consistent with evidence of tightening livelihood conditions intimated in Section 3 and detailed further below. A final point, which refers to Figure 4, is that broad rates of unemployment are not to be ignored, particularly among urban youths where domestic work is less prevalent. This is clarified by the next fact.

Table 4: Economic activity rates, by location and gender

Age group	Survey	Urban		Rural	
		Male	Female	Male	Female
Youth	96/97	52.0	49.2	74.2	90.1
	02/03	48.5	54.3	67.7	86.2
	04/05	51.2	58.0	79.0	92.0
	08/09	50.2	57.1	77.1	89.3
Adult	96/97	91.3	74.8	96.8	97.5
	02/03	97.1	85.4	99.6	99.2
	04/05	90.5	86.5	95.8	97.7
	08/09	90.5	88.2	97.6	97.6

Source: authors' estimates from household survey series.
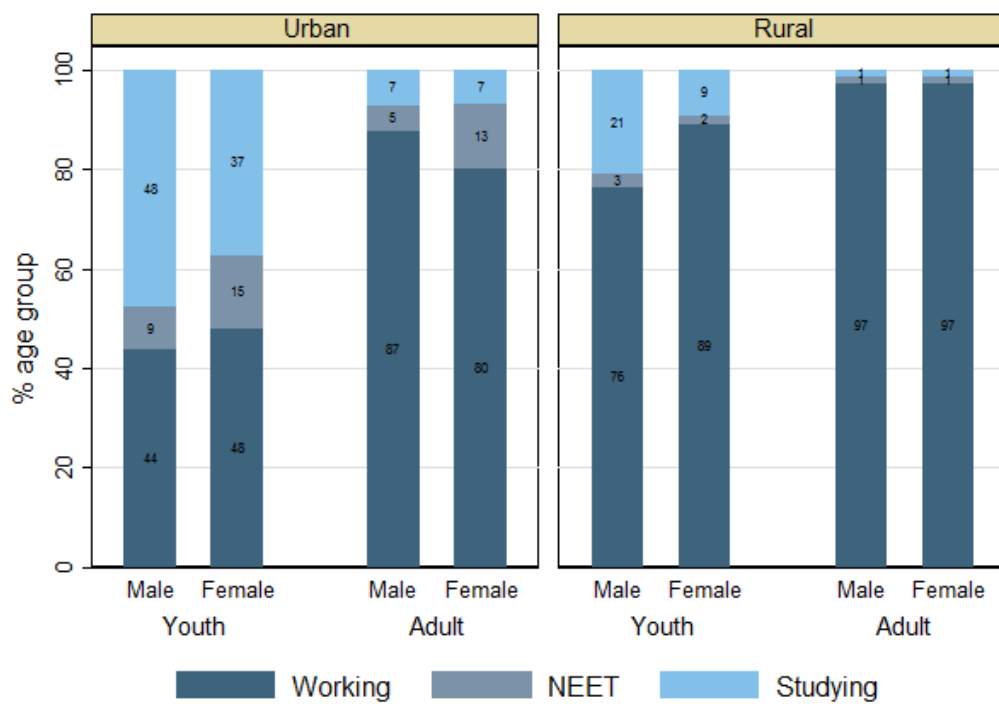
Source: authors' calculations from 2008/09 household survey.

Figure 5: Allocation of working age population by activity

Stylized Fact 3

Under-employment is rife.

Despite the fact that most of the economically active population are economically active and have some form of job, only a minority of workers are fully employed. This suggests that low productivity, low quality (or bad) jobs are prevalent. Evidence on under-employment comes from reported number of hours worked, from which a simple differentiation between the fully-, under- and un-employed can be made.[8] Data on the share of economically active persons falling into these categories for each survey is provided in Table 5. To assist interpretation, the table includes an additional category which refers to individuals who claim to be both working and studying. As the education system has seen rapid expansion during the post-conflict period, allowing many youths and adults to further their education, it is helpful to keep this group distinct from the non-studying and (thus) 'genuinely' under-employed.

Table 5 indicates that urban areas have seen minimal changes in the degree of employment over time. Around 50% of the labour force is fully employed, and narrow or open unemployment has hovered around 10%. The only significant change in the urban labour market appears to have been a shift of workers from under-employment to combining work and study, which would be consistent with individuals investing spare time to raise their skills in order to secure a higher productivity (full-time) occupation. In contrast, however, the same evidence on hours worked points to a gradual tightening of the rural labour market. Rates of underemployment have fallen from around 70% to 50% over the period and, correspondingly, full employment rates have risen from 27% to 43%. These changes would be consistent with per capita consumption gains that are driven primarily by increased hours worked rather than any significant improvement in (agricultural) productivity such as via the introduction of new technology or capital accumulation.

Finally, a gender dimension in the degree of employment should be highlighted. Although not shown in the table, the data reveals that women in urban areas show comparatively higher rates of under- and unemployment, where the latter includes those being available for as well as actively seeking work. This is not the case in rural areas, potentially suggesting that gender-based occupational discrimination is more acute in urban occupations. A related explanation is that women in urban areas often combine domestic work with productive activities (in the home), while men face fewer constraints on their availability to engage in work (outside the home).

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[8]Data on hours worked should be treated with some caution given the prevalence of the informal sector (see below) and particularly because there are numerous missing values. Even so, these results are consistent with the overall pattern in the labour market described in this section.

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Table 5: Distribution of work force by employment status

		'96/97	'02/03	'04/05	'08/09	Δ
Urban	Fully employed	52.6	42.5	46.4	49.0	*-3.5*
	Under-employed	37.5	39.5	33.1	34.5	*-3.0*
	Work + study	0.9	5.9	6.5	7.6	*6.8*
	Unemployed	9.1	12.2	13.9	8.9	*-0.2*
Rural	Fully employed	27.3	36.5	37.3	42.9	*15.7*
	Under-employed	69.4	57.7	56.1	49.2	*-20.2*
	Work + study	0.5	3.2	5.8	7.5	*7.0*
	Unemployed	2.8	2.7	0.8	0.4	*-2.4*

Notes: the final column indicates the absolute difference between 2008/09 and 1996/97.
Source: authors' estimates from household survey series.

Stylized Fact 4

> *The informal sector is large and is the principal locus of new job creation.*

The importance of the rural labour market, as well as the prevalence of under-employment (measured by hours worked), intimates that higher quality jobs may be limited in Mozambique. This is confirmed when we investigate where and to whom people sell their labour services. Figure 6 classifies workers (those with jobs) into three broad groups – those receiving a wage (*assalariados*), the self-employed with or without employees (*trabalhadores de conta própria com ou sem empregados*) and unpaid family workers (*trabalhadores familiares sem remuneração*).[9] Assuming the informal sector is broadly consistent with the latter two groups, we see that in both rural and urban areas, these are by far the most important sources of employment. In rural areas in particular, only 5% of jobs are plausibly located in the formal sector; this rises to a little over 30% in urban areas. The largest category in both locations is the self-employed, which represents approximately one half of all Mozambican workers.

At an aggregate level, the absence of wage work is perhaps more startling. Only 12% of all workers report receiving a wage, of which almost 80% are men. As the figure shows, the proportion of workers found in each of these categories has remained highly stable over time, despite rapid economic growth. This indicates there has been no particular tendency for the economy to generate new jobs in the formal sector. As wage jobs are in a clear minority, it follows that job creation has occurred predominantly in the informal sector. It is also the case that female workers are found predominantly in the informal sectors.

How do these figures compare to other economies? According to statistics compiled by Oya (2010), taken from the ILO's Key Indicator series, the small share of wage earners out of all workers found in Mozambique is broadly consistent with other low income African economies in which agriculture is a dominant occupation (e.g., Tanzania, Burkina Faso, Mali). However, it is entirely inconsistent with its richer Southern African neighbours (e.g., South Africa) where wage employment is in the majority, but also where open unemployment is a very significant concern (e.g. Kingdon et al., 2006). These comparisons are relevant from the perspective both of identifying appropriate comparators as well as to help think through plausible future jobs scenarios (see Sections 7 and 8).

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[9]We recognize that these categories are internally diverse. For instance, salaried workers includes a wide range of types and conditions of jobs, ranging from (frequently) low-paid agricultural work to higher-paid non-farm occupations.
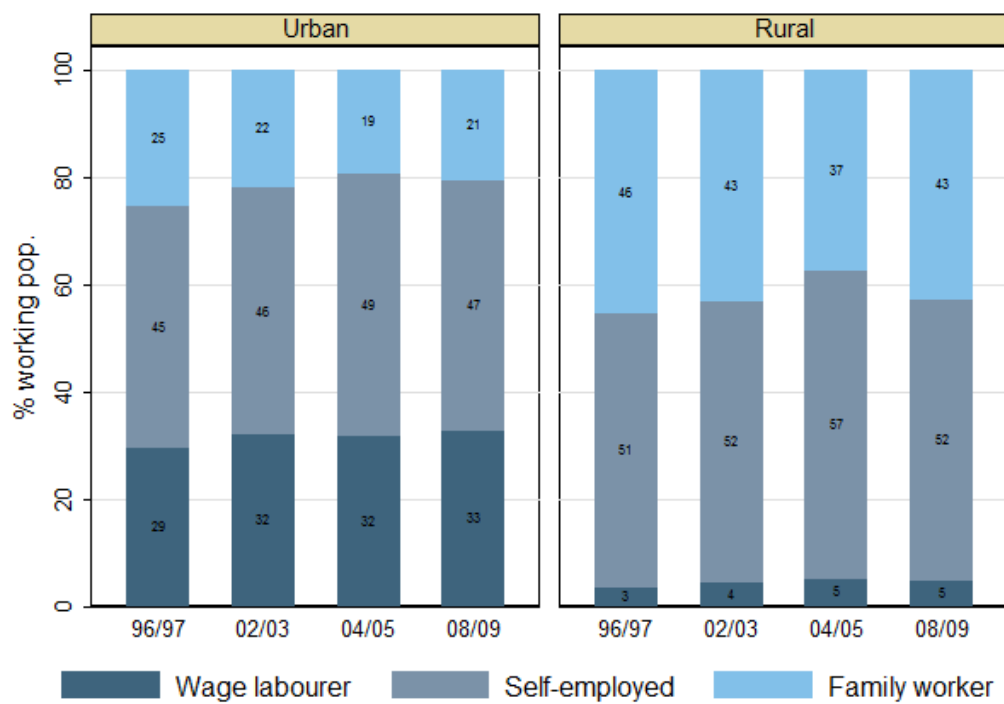
Source: authors' calculations from household survey series.

Figure 6: Distribution of workers, by type of employment

Stylized Fact 5

Levels of education (skills) remain low throughout the economy.

The consequences of Mozambique's long and bitter experience of conflict are both numerous and persistent. A major effect has been the retardation of the post-independence objective to revert the legacy of Portuguese colonialism, which left the vast majority of Mozambicans without any form of education or modern skills. During the recent post-conflict period, rehabilitation and expansion of the school system has been a major policy objective, supported by large amounts of foreign aid. As Arndt et al. (2007) document (also DNEAP, 2010), results have been impressive and enrolment rates have risen dramatically. However, aggregate measures of human capital – such as the mean years of schooling (used here) – only change slowly as education permeates through younger cohorts into the work force.

Table 6 and Figure 7 indicate how the skill level of the work force has improved over time. The former divides the working population into youth/adult and rural/urban subgroups; the latter considers skills at the sectoral level. Which ever way the data is cut, the overriding point is that while skills have clearly improved they remain low. In all of the subgroups and sectors, the average worker has less than a completed primary education (7 years of schooling). Tertiary workers, which include the majority of public servants, are the best educated in general; similarly, urban males (youth and adults) are the best educated of the subgroups shown.

Three further points can be highlighted about the distribution of skills in the work force (economy). First, Table 6 reveals a clear gender-gap whereby female workers typically have at least one year less education than males. This difference is highest and most persistent among adults, where the male-female education has risen to more than two years in both rural and urban areas. Bucking this trend are urban female youths, which appear to be (slowly) closing the education gap with their male counterparts, although more data points will be necessary to support this trend. Second, and relatedly, youths now tend to be significant better educated than adults. This is most dramatically the case among rural workers (including women). Third, there are persistent and large education gaps between sectors. Unsurprisingly, primary sector (predominantly rural) workers have the lowest average level of education at less than three years. However, it is not the case that educated workers have been drawn to occupations where average education levels are most scarce and therefore might yield higher returns. Rather, the average level of education has risen slightly more in absolute terms in secondary and tertiary sectors over the period of the surveys (see Figure 7). Thus the average tertiary worker has almost four years more education than those in the primary sector. This is pertinent as the employment aspirations of youth are likely to be conditioned by existing labour market structures and institutions.[10]

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[10]Indeed, researchers have noted a concern that: "young Africans are increasingly reluctant to pursue agriculture-based livelihoods, which could have major implications for continent-wide initiatives to revitalise the agriculture

Table 6: Distribution of work force by years of education

Age group	Survey	Urban		Rural	
		Male	Female	Male	Female
Youth	96/97	4.91	3.56	2.45	1.42
	02/03	4.69	2.36	1.65	0.77
	04/05	4.72	3.83	3.21	1.94
	08/09	6.13	5.05	4.70	3.02
	Δ	1.22	1.49	2.25	1.60
Adult	96/97	4.90	2.35	2.25	0.64
	02/03	5.21	2.29	1.59	0.34
	04/05	6.19	3.36	3.02	1.06
	08/09	6.13	3.70	3.27	1.26
	Δ	1.23	1.35	1.03	0.62
Ratio	08/09	1.00	0.73	0.70	0.42

Notes: Δ gives the absolute difference in years of education between 2008/09 and 1996/97 for each subgroup; 'Ratio' is the youth/adult years of education ratio in 2008/09.
Source: authors' estimates from household survey series.

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sector."(Future Agricultures, 2010, p.3), which has been linked to perceptions of agriculture as a low-skill, distasteful occupation. See Perry (2009) for discussion of the complex cultural issues surrounding the employment of young men in a rural Senegalese context.
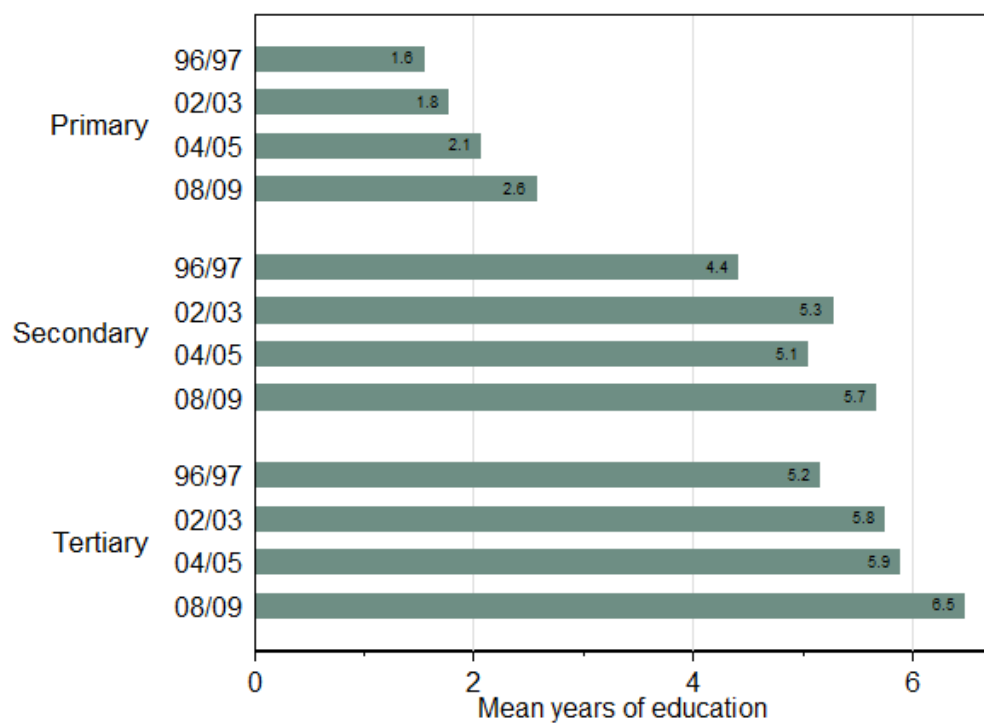
Figure 7: Mean years of education among workers, by broad economic sector

Stylized Fact 6

Structural change in the labour market has been limited.

A critical development outcome directly associated with the labour market is the sectoral distribution of employment. Indeed, a well-known characteristic of structural transformation from lower to higher aggregate income is a movement of labour out of agriculture and into industry. As Rodrik (2007) puts it, based on contemporary evidence from successful transformations, this is associated with two general patterns; namely that: (i) rapidly growing countries are those with large manufacturing sectors; and (ii) growth accelerations are associated with structural changes in the direction of manufacturing. Survey evidence from Mozambique, however, suggests that this kind of structural transformation has yet to begin. As shown in Table 7, the share of the work force in agriculture remains persistently high at over 80%, while that of manufacturing has essentially stagnated in relative terms at under 4% of all workers. This is not driven by the rural population alone. Figure 8 indicates that even in urban areas 46% of all workers in 2008/09 work in the primary sector, 42% in the tertiary sector and only 11% in the secondary sector. The small relative shift that has occurred out of agriculture therefore can be understood as largely an urban phenomenon with the preferred destination sector being some form of services, typically (petty) commerce (see Table 7).

It is worth remarking that the apparent dearth of structural change in the Mozambican labour market, despite encouraging macroeconomic performance, is not unique. In an analysis of recent growth experiences, McMillan and Rodrik (2011) argue that structural change observed in Africa and Latin America has broadly been growth-reducing. This is because labour has failed to move from lower toward higher productivity sectors; rather, labour has typically moved from low productivity rural agriculture to even lower productivity urban activities (or unemployment, job search), contributing no aggregate growth gain. Page (2012a,b) tells a similar story and further identifies the general phenomenon of de-industrialisation across Africa – specifically a decline in the size, diversity and sophistication of processed exports (including agro-industry and tradable services) – as a key challenge that has received little attention from foreign donors. As shown above (also Cunguara et al., 2011a; Page, 2012c), evidence from Mozambique is broadly consistent with these trends.

Table 7: Allocation of workers, by sector (%)

	'96/97	'02/03	'04/05	'08/09	Δ
Agriculture	85.2	79.9	80.7	80.6	*-4.6*
Mining	0.5	0.5	0.2	0.2	*-0.3*
Manufacturing	2.7	3.6	2.8	2.7	*0.0*
Construction	1.4	1.6	1.4	1.7	*0.3*
Transport	1.1	1.1	0.8	0.8	*-0.2*
Commerce	4.0	7.3	7.8	7.9	*4.0*
Services (other)	2.7	2.8	2.9	2.9	*0.2*
Education	0.8	1.6	1.6	1.7	*0.9*
Health	0.5	0.5	0.5	0.4	*-0.1*
Government	1.2	1.2	1.2	1.1	*-0.2*

Notes: Δ gives the absolute difference in sector share between 2008/09 and 1996/97; each column sums to 100.
Source: authors' estimates from household survey series.
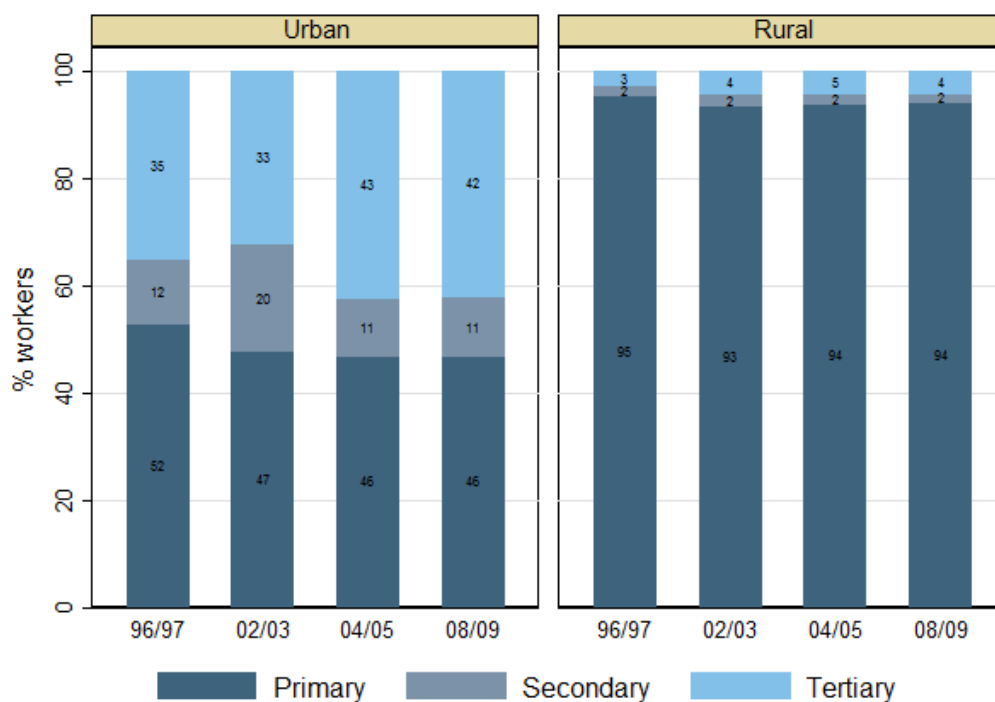
Source: authors' calculations from household survey series.

Figure 8: Distribution of workers, by broad economic sector

Stylized Fact 7

There are large spatial differences in the distribution of Mozambican labour.

Mozambique's climate and geography hold important implications for its labour markets, as well as potential links between labour and product markets. On the one hand the capital city, Maputo, is located in the far southern tip of the country, close to South Africa. Indeed, Maputo was developed by the Portuguese precisely to facilitate the export of industrial goods from its neighbour, being the closest deep water port to the Witwatersrand area. At the same time, the southern zone of Mozambique is comprised largely of arid and semi-arid agro-ecological zones, which are prone to drought and typically associated with lower soil fertility. The central and northern regions of Mozambique, which are separated from the capital city by more than 1000 km, are generally more favourable to rain-fed and irrigated crops, including cash crops such as tobacco, cotton, and coconut. As Figure 9 shows, it is precisely in the rural areas of these regions where one encounters the vast bulk of the agricultural workforce, as well as overall population. However, it is in the urban south that the bulk of all non-primary workers reside. Specifically, more than half of all urban secondary and tertiary sectors are located in the south (essentially the greater Maputo region).

This spatial variation in labour has been persistent over time, further underlining the thesis that there has been minimal positive structural change. The disconnect between the south and the rest of the country is economically important because high transport costs (distances) limit the potential for positive multiplier effects running from agriculture to cheaper urban wage goods, as well as from urban demand to agriculture. It also limits the scope for growth of agro-processing focused on domestic markets as the locus of such demand is distant from regions with the most productive potential. Indeed, the (substantially) better-off urban south has been heavily reliant on South African agricultural imports, a trend that likely has been bolstered by the recent expansion of large South African supermarket chains (e.g., Shoprite, Spar, Pick 'n' Pay, Woolworths) in the Maputo region as well as a strong real exchange rate.
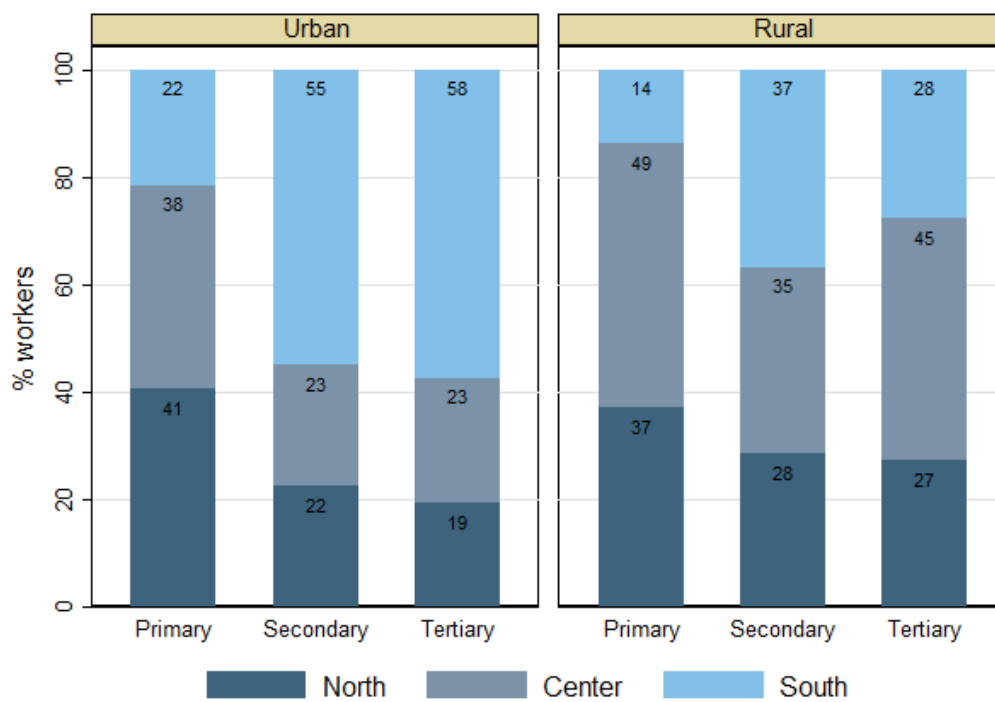
Source: authors' calculations from household survey series.

Figure 9: Spatial distribution of workers, by broad economic sector and geographical zone

Stylized Fact 8

Productivity gaps between sectors are large and widening, largely due to slow productivity growth in agriculture.

Thus far, we have found persistent differences in the average level of skills (education), spatial distribution and relative size of labour across sectors. The same goes for the productivity of labour. Mapping total hours worked, estimated from the micro-data sources, to the aggregate sectoral classification employed in the Mozambican national accounts, we derive estimates of the real productivity of labour – i.e, the mean value added contributed by one hour of labour services. Aggregated to the primary/secondary/tertiary industrial sectors, these estimates are depicted in Figure 10, stated in constant international dollars (per hour).[11] Four main points can be highlighted from these numbers. First, overall levels of productivity are low – on average Mozambican workers generate less than 1 dollar of value added per hour of work. It is interesting to compare these estimates to the statutory minimum wage rates in Mozambique (which apply across the formal sector, with different rates for different occupations). These imply a far higher average level of productivity. For instance, monthly minimum wages in the agricultural sector are set at over 2,300 Meticais per month (in nominal 2012 wage rates). This translates to around 1 international dollar per hour, which is three times higher than overall hourly labour productivity in that sector, even before separating out payments to labour and capital.

Second, there are very large productivity differences between sectors. The primary sector, which is dominated by agriculture, has the lowest labour productivity. Based on estimates from 2009, labour productivity is almost 7 times higher in the tertiary sector and 10 times higher in the secondary sector. Other sources of data support the general contention that productivity in the agricultural sector is not only especially low, but also has remained broadly stagnant over the post-conflict period. For instance, calculations in Table 8 developed from successive agricultural surveys, show that crop productivity – whether measured as calories-produced per hectare under cultivation or as calories-produced per head of rural population – has marginally fallen over the period 2002-2008. This can be traced to the persistence of extremely rudimentary technologies (.e., non-use of fertilizers, lack of access to extension information etc.), a reliance on rain-fed crops and poor rural infrastructure which in turn raises transaction costs. Indicative statistics in this regard are found in Table 9.

Third, there is no evidence of convergence in sectoral productivity. Rather, the gap between the primary and secondary sectors has widened over the period shown. This can be traced to two

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[11]We arrive at international dollars by first converting from 2003 constant values in New Mozambican Meticais (US\$ 1 = 23.7 Meticais) and then apply the PPP conversion factor of 2.5 from the International Comparison Programme (see: siteresources.worldbank.org/ICPEXT/Resources/ICP_2011.html), yielding a PPP-adjusted exchange rate of 11.8 to the dollar. The resulting story from these figures is highly consistent with alternative labour productivity measures, such as those based on the numbers of individuals working in each sector.

related phenomena – a small number of capital-intensive 'mega-projects' developed by foreign investors, such as the Mozal aluminium smelter, combined with weak employment growth in the secondary sector. Fourth, the figure shows that productivity growth in the secondary sector appears to have slowed over recent years. On a related note, firm survey evidence indicates that the productivity of Mozambique's manufacturing firms remains low in relation to its low income peers and its geographical neighbours. This is revealed in Table 9 which reports estimates of sales and value added (per worker) for a representative small food processing firm. The point to note is that despite nominal wages being at a similar level to its peers, productivity in Mozambique measured in value added terms is just over half of those in other countries.
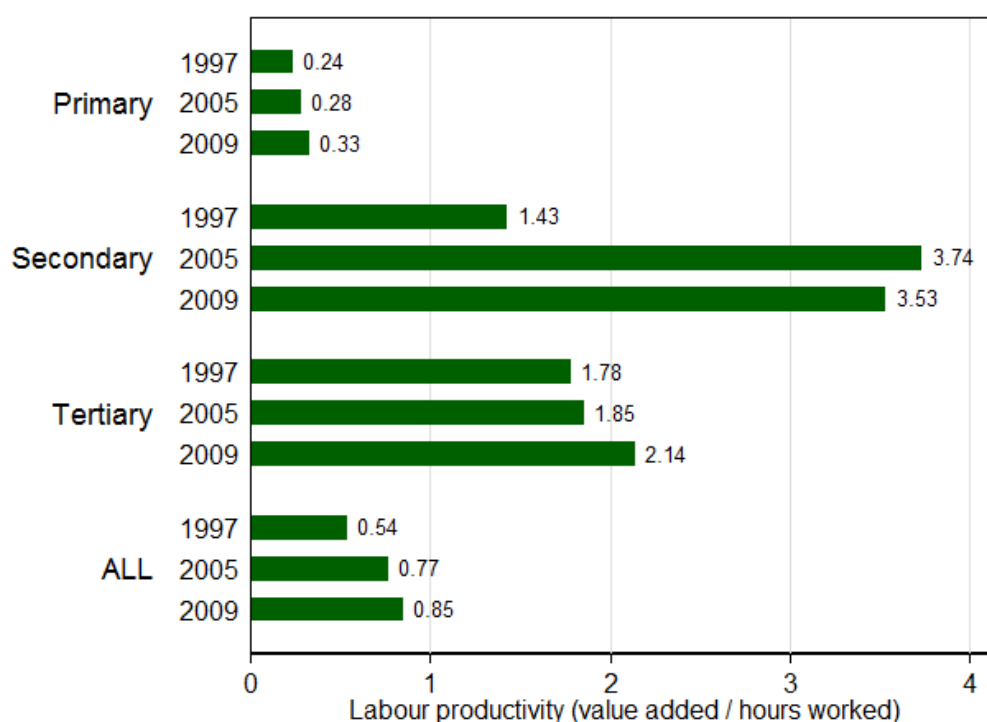
Notes: values are stated in real international dollars (2003 prices) per hour worked; see text for details.

Source: authors' calculations from household survey series.

Figure 10: Estimates of average labour productivity, by economic sector

Table 8: Crop production estimates

	Total production (index)	Productivity (kcal / ha)	Productivity (index)	Calories (person / day)
2002	100.0	2,307	100.0	2,135
2003	124.2	2,643	114.6	2,583
2005	111.3	1,935	83.9	2,103
2006	140.9	2,424	105.1	2,717
2007	128.6	2,189	94.9	2,422
2008	113.8	1,961	85.0	2,000
Δ	13.8	-15.0	-15.0	-6.3

Notes: Δ gives the absolute difference between 2008 and 2002; indexes set at 2002=100.
Source: DNEAP (2010).

Table 9: Agricultural technology adoption indicators (% farms)

	2002	2003	2005	2006	2007	2008	Δ
Receipt of extension info.	13.5	13.3	14.8	12.0	10.1	8.3	*-5.2*
Use of chemical fertilizer	3.8	2.6	3.9	4.7	4.1	4.1	*0.3*
Use of pesticides	6.8	5.3	5.6	5.5	4.2	3.8	*-3.0*
Use of irrigation	10.9	6.1	6.0	8.4	9.9	8.8	*-2.1*
Receipt of credit	-	2.9	3.5	2.9	4.7	2.6	-
Used animal traction	11.2	10.9	9.3	12.4	11.5	14.3	*3.1*
Membership of association	3.7	4.8	6.4	6.5	8.3	7.4	*3.7*
Hired permanent labor	2.2	1.9	1.8	2.2	2.6	3.0	*0.8*
Hired seasonal labor	15.5	15.3	17.6	23.8	20.8	19.6	*4.1*

Notes: Δ gives the absolute difference in each indicator between 2008 and 2002.
Source: DNEAP (2010) and authors' calculations using agricultural survey (TIA) data.

Table 10: Comparative manufacturing performance metrics (2008)

	Sales/worker (annual)	VA/worker (annual)	Wage (US$ month)
Mozambique	11,932	3,516	53
Indonesia	13,200	6,535	56
Malawi	24,686	7,754	50
Angola	24,053	8,476	139
Zambia	22,948	8,725	69
South Africa	84,373	28,653	467

Notes: numbers refer to a small company in the food industry; the estimates for each country come from different sources and thus cannot be compared directly; they are nonetheless indicative.
Source: World Bank (2009).

Stylized Fact 9

Household income sources have become more diversified over time.

A complementary symptom of Mozambique's failure to generate sufficient, higher productivity, good jobs is that households have increasingly come to diversify their jobs portfolios. Figure 11 categorises households by the number of distinct sources of income they report as receiving.[12] The figure reveals that multiple sources of income have become the norm. For workers in rural areas, around 43% of households report receiving more than one kind of income source, up from just 19% in 1996/97. An important driver of this trend is an increase in the share of rural households reporting receipt of a transfer (or rental) income, which has increased from 18% to 33% from 1996/97 to 2008/09. One interpretation is that some rural households increasingly employ internal migration and extended family networks as a livelihood survival strategy, particularly in the context of weak agricultural productivity growth. It is also notable that urban households have followed a similar pattern of pursuing multiple income sources. This may be because many jobs (such as in the informal sector) are vulnerable and generate low returns, which in turn cannot support a household. On the other hand, income diversification also could be indicative of (a tentative) movement into non-farm occupations, which can be seen as a first step in the direction of structural transformation. This theme is explored further in the next sections.

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[12]These sources are: non-wage agricultural income (excluding income from animal husbandry activities); non-wage income from animal husbandry; non-agricultural income from self-employment; wage income and transfer or rental (non-labour) income.
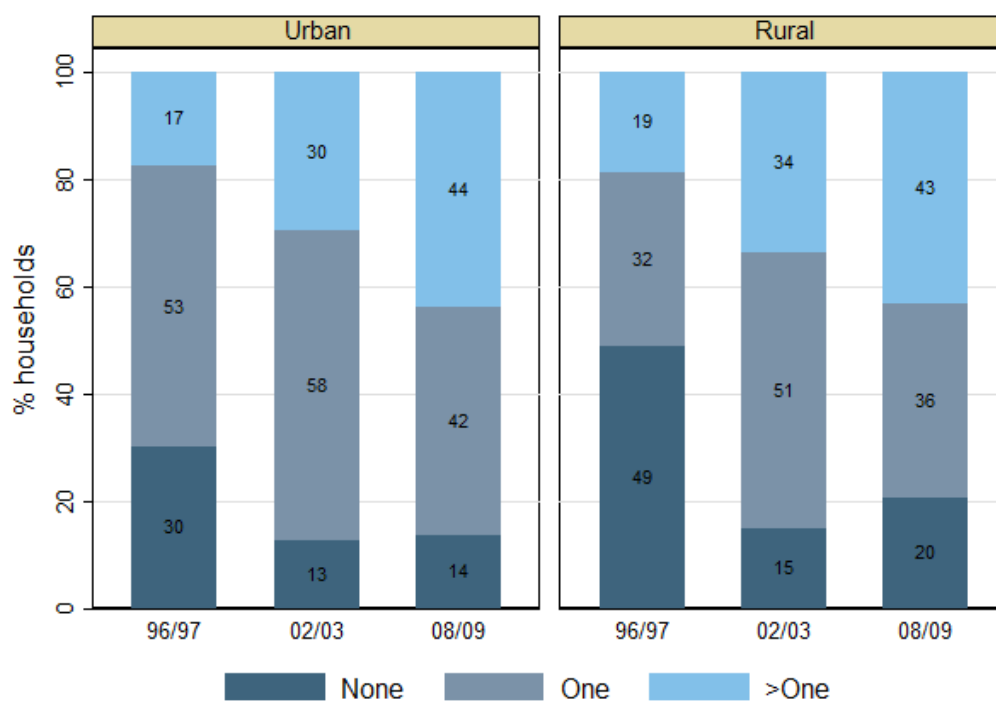
Notes: income sources are as described in the text, the maximum being four.

Source: authors' calculations from household survey series.

Figure 11: Categorization of households (in %) by number of distinct sources of income

Stylized Fact 10

Social discontent appears to be rising, particularly among the urban youth.

A vital aspect of jobs is their contribution to social cohesion (see Section 2). Where employment is scarce or vulnerable, social cohesion becomes frayed, particularly where there are sudden shocks to living standards. Over the past few years Mozambique has suffered isolated incidents of unrest of this kind. The first occurred in February 2008, largely in response to rises in the cost of collective transportation linked to fuel prices. The second occurred in September 2010, also due to rising utility, transport and food prices. However, an underlying aspect of these events is persistent poverty and perceptions of rising inequality.

What is the link between jobs and social cohesion in Mozambique? No doubt this is complex terrain, but some guidance comes from an analysis of the AfroBarometer opinion surveys, undertaken in Mozambique to (small) nationally representative samples of the adult population in 2002, 2005 and 2008. The results indicate that concerns around lack of access to employment are most acute among the urban youth. This is indicated in Figure 12, which plots the share of respondents from the 2005 and 2008 surveys at each age that consider jobs to be a key economic problem. Almost 50% of all urban adults below 45 years of age consider jobs to be a problem; however, this view is supported by less than 30% of rural respondents. A closer look at the data also shows that there seems to be rising rates of mistrust of high level authorities (as based on the perceived degree of trust of the President asked in the questionnaire) among urban youths, and particularly those that claim to receive some form of cash or wage remuneration. This is shown in Figures 13 and 14. The implication is that the most vocal concerns surrounding jobs are likely to emerge from younger urban cohorts, reflecting frustration from unmet expectations of finding stable, quality employment. Without seeking to belittle their concerns, it should be realised that this (vocal) cohort is not necessarily the most disadvantaged. Thus, urban social discontent around jobs may provide a misleading guide to policy priorities.
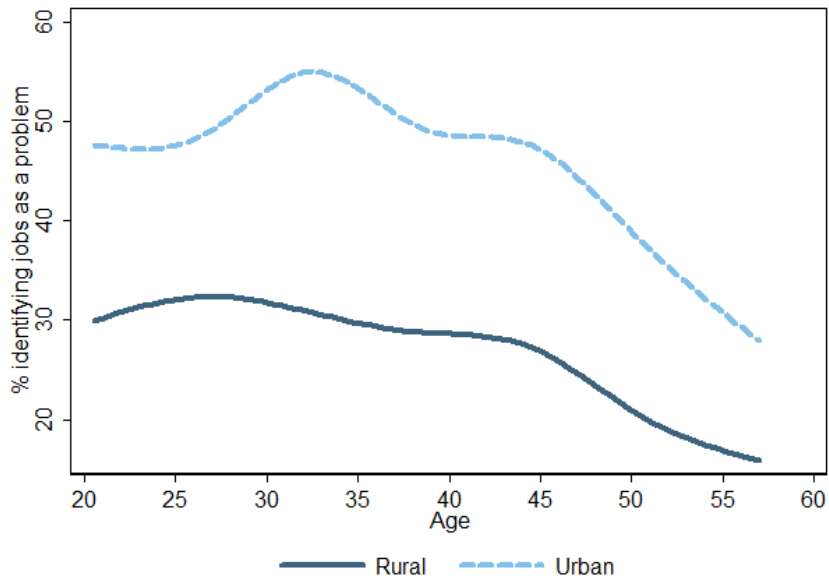
Figure 12: Proportion of adults, by age, identifying jobs as a problem
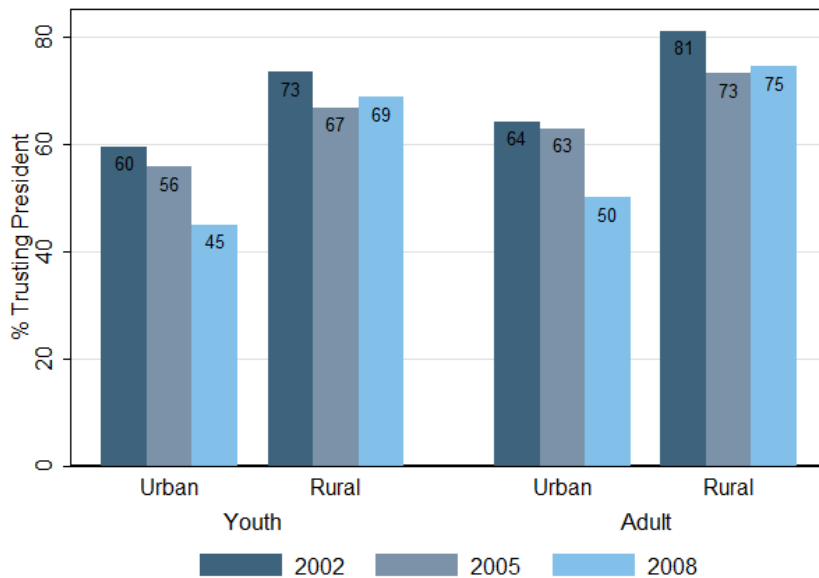
Figure 13: Share of rural/urban age cohorts trusting the President
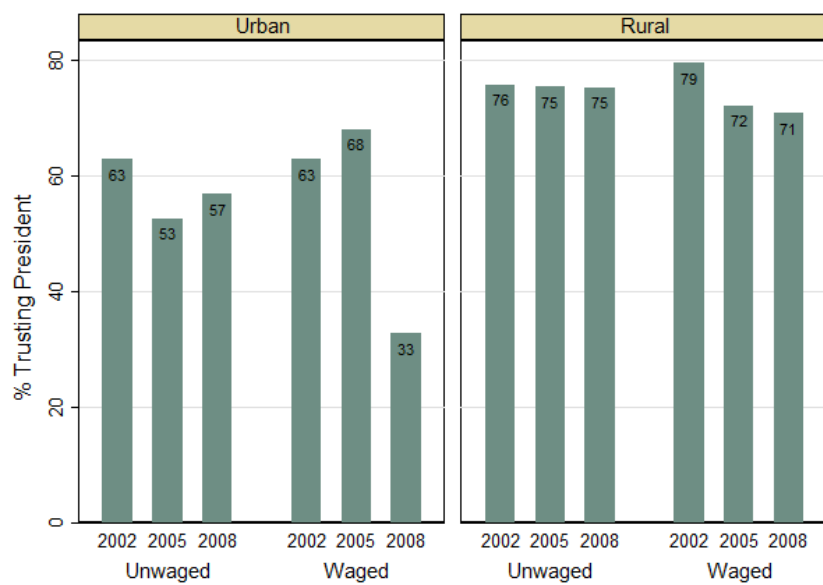
Notes: "Waged" refers to receiving some form of cash remuneration from sale of labour services.

Source: authors' calculations from AfroBarometer surveys 2002, 2005 and 2008.

Figure 14: Share of population subgroups, classified by income source, trusting the President

5 Methodology

The previous section presented evidence that, despite rapid rates of aggregate economic growth, Mozambique's labour market has undergone limited transformation. Similar to the immediate post-conflict period, the vast majority of Mozambicans are engaged in low-productivity agricultural work. Even in urban areas, informal activity is predominant and, as a share of the working population, only a small minority are formally employed. The fundamental issue, particularly for policy-makers, is how this evidence should be interpreted. Is it explained by the existence of imperfections directly associated with the labour market? Or, is it merely symptomatic of weaknesses that originate outside the labour market? Taking the latter case, it could be that labour markets operate relatively efficiently and individuals are able to select occupations or activities that maximise utility (see further below). Thus, the co-existence of (broad) labour market stagnation and persistent headcount poverty rates might principally reflect low (average) levels of technology, human and physical capital across the economy. Labour productivity differentials between sectors, equally could be explained by compensatory differentials – i.e., from differences in endowments (including technology or capital per worker), individual ability or preferences. In this case, the link between jobs and poverty outcomes reflects an accounting identity, the policy remedy being to support enhancements on the supply-side of labour and capital markets.

On the other hand, more specific mechanisms may be at play which constrain or trap individuals in lower-productivity activities. Thus, whilst in principle individuals could make a Pareto-improving movement out of one activity into another, imperfections of one sort or another (including absent or dysfunctional economic institutions) restrict their ability so to do. If this is the case, then the connection between labour markets and poverty is more direct and causal in nature. The diagnosis also would be different. Policy-makers would be advised to eliminate the sources of these market imperfections and improve the functioning of labour (and other factor) markets in order to allocate resources more efficiently across the economy.

The two opposite cases described above illustrate the importance of grasping labour market outcomes and processes (jobs) to sharpen our understanding of poverty. Whether or not labour market imperfections are an underlying explanation of persistent poverty, a jobs lens can provide substantive policy-relevant insight to questions about enhancing social welfare. As ever, the challenge is how to distinguish between these rival explanations. The remainder of this section describes our approach. First, we set up a simple theoretical framework. This provides a microeconomic foundation to the analysis, thereby avoiding the charge of pursuing 'measurement without theory' (Koopmans, 1947). Second, we examine the empirical implications of the model and identify a number of testable hypotheses that help distinguish between competing mechanisms. Third, we describe the specific empirical methods that will be used to answer these

questions.

5.1 Theoretical framework

Applying a jobs lens to the question of poverty outcomes requires a model of what determines the supply of labour to different activities – i.e., why do individuals do what they do? A useful entry point is the canonical household time allocation problem, incorporating labour market failures, which has been used extensively to study the implications of perfect versus imperfect labour market conditions in developing countries (e.g., de Janvry et al., 1991; Benjamin, 1992; Jacoby, 1993; Skoufias, 1994; Le, 2009, 2010). While this type of model has been applied most frequently to rural labour markets, in which household production is widespread, there is no *a priori* reason why it cannot be extended to cover labour supply decisions generically. Such a generalisation is particularly apposite to the case of Mozambique. As noted in Section 4, the bulk of all households in both rural and urban settings are engaged in some form of household-level production, as opposed to being engaged in an individualistic external wage labour market.

Following the above, a core assumption of the model is that the household acts as a unitary decision-maker, meaning that household endowments are pooled into a single allocation strategy and preferences are jointly defined over consumption goods. For simplicity, the present model focusses primarily on labour-related inputs and constraints, thus placing to one side the specifics of fixed and variable inputs into household production. However, the intuition and results apply generally to settings in which households face capital market constraints and/or transaction costs that limit access to non-labour production inputs.

To begin, we assume the household maximises expected utility, defined as a deterministic function of a single consumption good (C), leisure (l) and preference shifters (Z) (e.g., location and the number of children): $\mathcal{E}(U) = U(C, l; Z)$, with the usual non-satiation properties: $U_C > 0$, $U_l > 0$. Maximization is subject to budget constaints over time (labour supply) and expenditure. With regard to the former, three potential productive activities are available – household labour in agriculture (L_a), household non-farm labour (L_n) and wage labour in the market (L_m). Total time available to the household is fixed by: $T = L_a + L_n + L_m + l$. Expenditure is constrained by total income from each of the three sources of productive activity. Normalising the price of consumption goods to one and ignoring non-labour income and possible dissaving, this constraint is:

$$C = p_a Y_a(L_a, X_a, K_a) + p_n Y_n(L_n, X_n, K_n) + w(X_m)L_m \tag{1}$$

where p_i are product prices, X_i characteristics that affect marginal returns to labour in activity i (e.g., skills), and K_i fixed inputs into household production, $i \in (a, n, m)$. Y_a, Y_n represent production functions for family farm and non-farm activities respectively, net of the contribution

of variable inputs and for which we assume the 'no free lunch' condition: $Y_i(L_i = 0, \dots) = 0$. Generic labour market imperfections are captured by the following set of constraints:

$$L_a \geq 0 \tag{2}$$

$$0 \leq L_n \leq L_n^* \tag{3}$$

$$0 \leq L_m \leq L_m^* \tag{4}$$

Consequently the household problem can be summarised as:

$$\text{Max}_{L_a, L_n, L_m} U(C, T - L_a - L_n - L_m) \tag{5}$$

subject to: $(1), (2), (3), (4)$

Necessary Karush–Kuhn–Tucker (KKT) conditions for the solution of this problem yield the following optimality properties of labour's marginal product in different activities:

$$p_a Y_a' + \frac{\mu_{a1}}{\lambda} = \frac{U_l}{\lambda} \tag{6}$$

$$p_n Y_n' + \frac{\mu_{n1} - \mu_{n2}}{\lambda} = \frac{U_l}{\lambda} \tag{7}$$

$$w(X_m) + \frac{\mu_{m1} - \mu_{m2}}{\lambda} = \frac{U_l}{\lambda} \tag{8}$$

where λ is the marginal utility of income and μ_{i1}, μ_{i2} are the KKT multipliers associated with potential labour market failures, derived from the Lagrangean. These multipliers can be read as shadow prices associated with particular labour market constraints. Specifically, for $i \in (a, n, m)$, if labour does not face constraints in activity i then $0 \leq L_i \leq L_i^*$ and the complementary slackness conditions are such that $\mu_{i1} = 0, \mu_{i2} = 0$ and the marginal product of labour in i is equal to the shadow or reservation wage, defined as the (unconstrained) opportunity cost of time: $w^* = U_l/\lambda$. However, if activity is bound by a non-negativity constraint, $L_i = 0$, then $\mu_{i1} > 0, \mu_{i2} = 0$. Alternatively, if labour supply is rationed (e.g., due to demand constraints), such that $L_i = L_i^*$, then $\mu_{i1} = 0, \mu_{i2} > 0$. In the latter two cases, then, the reservation wage will not equal the marginal product of labour in activity i, and the household may find itself at a corner solution.[13]

The above model of labour time allocation under labour market distortions provides one microfoundation to models of labour market segmentation, an extreme case being the pure autarky model of Sen (1966). Although the particular source of market distortion is left open, the general theoretical point is that where labour market constraints are binding, households may be forced to allocate all labour time to a single activity. This is a rational response given the set

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[13] As noted above, other sources of market imperfection such as transaction costs can generate similar divergences in labourŠs marginal product between sectors. The focus here, however, is on labour market issues only.

of constraints and simply represents a corner solution to the optimization problem set out in equation (5). To see this more clearly, it is helpful to define the full income constraint from (1), as:

$$
\begin{aligned}
C + lw^* &= p_a Y_a + p_n Y_n + w(X_m)L_m + lw^* && (9) \\
&= (p_a Y_a - L_a w^*) + (p_n Y_n - L_n w^*) + (w(X_m) - w^*)L_m + Tw^* \\
&= \pi_a + \pi_n + \pi_m + Tw^*
\end{aligned}
$$

where the final line defines full income as the sum of shadow profits from labour activities plus total income from potential labour priced at its opportunity cost. In the (stylized) case of constant returns to labour in household production, the same definition can be simplified using equations (6) – (8) as follows:[14]

$$
C + lw^* = \left(w^* - \frac{\mu_{a1}}{\lambda}\right) L_a + \left(w^* - \frac{\mu_{n1} - \mu_{n2}}{\lambda}\right) L_n + \left(w^* - \frac{\mu_{m1} - \mu_{m2}}{\lambda}\right) L_w + lw^*
$$

By definition from the properties of the utility function and the optimization problem, expected utility must be maximized when full income $(C + lw^* = Y^*)$ is maximised at shadow prices which reflect the set of prevailing constraints. For instance, consider a case where a household only engages in family agricultural production, such that their activity profile is $A = (L_a = T - l, L_n = 0, L_m = 0)$. This solution can be optimal under two main scenarios – the first is that, at the given solution, marginal returns in family agriculture are at least as high as in all other activity profiles and are equal to the shadow wage. Alternatively, labour's marginal product is higher in other profiles and thus is higher than the prevailing shadow wage. However, binding demand-side constraints at zero $(L_n^* = L_m^* = 0)$ would mean that the household cannot allocate labour to these other profiles, although it would be beneficial so to do.

5.2 Implications

Although the model developed in the previous subsection is both simple and stylized, it has important implications. The most fundamental is that if labour market constraints are binding, then the shadow wage rate and the market wage rate generally will diverge. Two corollaries follow immediately from this insight. First, the nature and degree of labour market constraints should be reflected by the sign and magnitude of differences in labour's marginal product between segments or discrete activities, such as wage versus family labour. As the example noted above made clear, in the case of binding demand-side constraints one would expect to see the marginal

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[14]The point to note here is that full income is a function of the reserve wage and KKT multipliers. This result does not require the assumption of constant returns to labour in household production, which is assumed here simply for expository purposes.

product of labour in the chosen (corner) solution to be lower than its hypothetical value in other segments.

The second corollary is that labour supply decisions are not separable from household preferences and, thus, cannot be modelled as unique functions of a given market wage rate and fixed household endowments. Consequently, empirical estimates of labour supply decisions must take into account all terms that enter the household's utility function. Continuing to assume the existence of discrete labour market segments, this suggests that household labour supply decisions can be characterised in a generalized Roy framework (see French and Taber, 2011). To do so, it is helpful to re-express the expected utility function according to the full income constraint, thereby making the effects of labour market imperfections explicit via the shadow wage rate. That is, define expected utility as:

$$U(\pi_a + \pi_n + \pi_m + (T - l)w^*, l; Z) \tag{10}$$

Therefore, the core idea is that we observe labour is supplied to segment $i \in P$ when $\forall j \in P$, $U_i \geq U_j$, $i \neq j$; and where U_i refers to the level of utility that would under be hypothetically obtained by choosing labour segment i.

With these general implications in mind, the next step is to identify specific, empirical tests that can shed light on whether labour market constraints are at play and, if so, what form they take.[15] Unfortunately, as Leontaridi (1998) conclude (echoing the earlier conclusion of Heckman and Hotz, 1986), existing empirical tests for labour market segmentation are subject to substantial ambiguity. In particular, there are difficulties in distinguishing between potential segments prior to testing for their actual separation, as well as doubts over the correct empirical specification for labour's marginal product (e.g., the correct functional relationship between earnings and education). Similar difficulties trouble tests for the separability between household production and consumption decisions (e.g., Le, 2010). Thus, there is no unique, decisive test (no *experimentum crucis*) that will unambiguously deliver the desired insight. This is especially valid given the nature of data available – e.g., we do not have experimental data, we do not follow the same individuals over time, and information about labour market conditions at both the household and local levels is limited.

Mindful of the limitations of any single test, it is appropriate to investigate the link between labour markets and welfare outcomes from different perspectives. Specifically, we ask three complementary empirical questions to the data. The first is straightforward and asks whether there is any *a priori* evidence of labour market segmentation. Hereafter referring to the

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[15]Recall, the fundamental issue is whether the coexistence of poverty and labour market stagnation is attributable to labour market imperfections, as opposed to being symptomatic of other weaknesses, such as low levels of human capital.

household's labour allocation profile as its labour portfolio, suggestive evidence in favour of a segmentation hypothesis would be a combination of: (i) marked bunching of households into corner solutions (single activities); and (ii) a clear welfare ranking of households compared across these corner portfolios. Thus the key contribution is to use the observed labour time allocation of households (categorised into distinct portfolios) to define potential labour market segments. This is in contrast to defining segments according to an outcome such as income, which has been common in the literature (and a source of controversy).

The second step is to use the utility specification, as per equation (10), to consider the determinants of entry into different portfolios, which are now taken to represent potential labour market segments. Following Abowd and Killingsworth (1984) and others, the key question is whether observable household endowments (and preferences) consistently explain the choice of portfolio, as might be expected in a well-functioning labour market. Alternatively a range of external factors, including proxies for external labour market conditions, may be critical to explaining portfolio choices. Indeed, a wide literature (e.g., Stifel, 2010; Brown et al., 2006; Cunguara et al., 2011b) investigates jobs or livelihoods selection propensities to shed light on the principal push and pull factors that underpin observed labour market patterns. Further details of how this is implemented can be found in the next subsection.

Third, we look at the determinants of household consumption (household earnings-type equations) across different household portfolio types. A comparison of the estimated coefficients across potential segments, as well as their relative explanatory power, provides insights into what is likely to be driving observed differences in welfare outcomes. Of particular interest is the degree to which (marginal) returns to household endowments are equalised across portfolios, which one would expect under a perfect labour markets scenario. As discussed extensively elsewhere (e.g., Heckman and Hotz, 1986), the magnitude and sign of differences in returns to human capital (education and experience) across portfolios can shed light on the kind of labour market imperfections that may be at play (if any).

5.3 Empirical strategy

Based on the above set of testable questions, we now discuss more specific details of empirical implementation. With respect to the delineation of potential portfolios, the starting point is to identify the main types of labour activity undertaken by households. Following the discussion of Section 5.2, we isolate the following four broad types of activity: (AH) Family agriculture; (NH) Non-farm household or self-employed labour; (AW) Agricultural wage labour; and (NW) Non-farm wage labour. For each activity, a household is given the value of one if at least one economically active member (of working age, defined as between 15 and 64) is engaged in this

activity as their primary occupation, and zero otherwise. At the extremes, a household that is not employed in any activity receives a series of four zeros; at the other extreme, at least one family member is engaged in every type of activity.[16] Based on an enumeration of all possible activity combinations, yielding ($n = 2^4$) unique categories, each household is then allocated to one of these portfolios. This provides a basis to analyse the prevalence of corner solutions, as well as their comparative welfare ranking.

In order to model the determinants of entry into alternative portfolios (identified in the previous step), assumptions must be made as to the form of equation (10) and the distribution of error terms. A standard approach is to adopt a linear approximation; thus, for each portfolio ($i \in P$) the latent utility index can be empirically specified as:

$$U_i \approx x'\alpha_i + z'\beta_i + v'\gamma_i + \eta_i \tag{11}$$

where x is a vector of household productive assets, including human and physical capital endowments, z a vector of household characteristics (such as its available supply of labour and demographic composition) and v a vector of variables reflecting proxies for labour market conditions. Under the assumption that $\forall i \in P$ each respective η_i is normal and identically Gumbel-distributed, the above specification can be estimated via a multinomial logit model, which focuses on estimating the contribution of these variables to the overall probability of observing a given household in each portfolio (for further details see Bourguignon et al., 2007).

Turning to the specific variables that enter on the RHS of equation (11), the vector of household productive assets includes measures of human capital and durable assets that plausibly enter affect household production or wage rates. As the attributes of durable productive assets are not measured in a consistent way across the surveys, we only use dummy variables reflecting ownership (access to) agricultural land for crop or other form of cultivation, livestock, means of transport, and communications technology (telephone, radio, TV). As the estimates are undertaken at the household level, choices must be made as regards how the human capital variables are specified. A variety of approaches are found in the literature; nonetheless we opt for the average work experience and years of education of all members of the household that are currently working. Work experience for each individual is estimated as their reported age minus their years of schooling minus 7. To capture possible non-linearities in these inputs (at the household level), we include their square; also, to reflect the effect of differences in the intra-household distribution of these assets (e.g., a single very educated member), we include their standard deviation (which takes a value of zero if there is only one working household member). In order to capture the importance of the household head, who may be the primary

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[16]Note that we do not weight these different activities according to labour hours or numbers of household members. This would add substantial complexity to the analysis and is questionable given the quality of data available. Moreover, as discussed in Section 6, this is somewhat redundant given the prevalence of corner solutions.

earner of the household, we include variables capturing his/her the age, gender and literacy.

The variables included to capture the demographic composition of the household are as follows: the (logarithm of the) number of actual workers; their gender composition, measured as shares of the household work force; the (logarithm of the) number of potential workers (i.e., anyone aged 7 and above who is not working); the (logarithm of the) number of children aged under 7; and the overall dependency rate. It is important to note that these variables do not only reflect taste shifters (preferences) over work, but those variables which refer to the number and type of workers in the household also are directly related to the household's productive capacity.

With respect to the vector of proxies for local conditions, we include three sets of measures. The first seek to capture differences in local productive conditions, such as infrastructure and transaction costs. To do so, we construct average measures of access to electricity, communications technology and other public goods at the regional level. As we do not have separate community-level characteristics (for both rural and urban areas), these are generated from the (unweighted) average of relevant household asset dummy variables for each primary sampling unit (PSU) in the survey (e.g., does the household use electricity?), from which we then calculate the average for all the PSUs in a given region. As the sample frame is representative at the regional level, these variables thus reflect proxies for regional averages of access to or penetration of these goods and services.

The second set seeks to capture the diversity and thickness of the local labour market, including the availability of opportunities across the jobs portfolios we have defined. To do so, we calculate the proportion of households engaged in each of the four portfolios at the regional level. These averages are included directly in the specification (with 'Ag' excluded to avoid collinearity). From these average shares we also construct a Herfindahl concentration index, which takes a value of one if all households in the region adopt the same portfolio. This can be read as a metric of the degree of labour market specialization in the region in which the household resides. The third set includes additional proxies for regional effects, namely the median wage rate and level of consumption. These are included simply to reflect differences in overall living standards and costs that are likely to map into differences in labour market conditions including on the labour demand-side. It is important to note that all the above regional variables are time-varying across the surveys, but would be absorbed by regional fixed effects if the analysis were undertaken for each survey individually. Indeed, one advantage of pooling the surveys is that we can distinguish between these time-varying and 'pure' fixed effects. Thus, we also include dummy variables for the regions employed, as well as dummy variables for each survey (in all cases excluding a base category).

Turing to the determinants of household consumption (welfare), an implication of the framework developed herein is that, assuming households are sorted into unique labour market segments, the

income/consumption function for each household takes a different form for each portfolio. For instance, if a household is exclusively active in family agriculture, then the income/consumption function can be seen as a household agricultural production function. However, if a household is exclusively active in wage labour, then the income/consumption function can be interpreted as a wage equation (of the Mincer sort). This underlines the relevance of investigating welfare determinants separately for each portfolio. However, as per the second step, it must be recognised that selection into each portfolios reflects a Roy-type sorting process which is not fully observed. In other words, welfare determinants must be investigated taking due account that they are pre-conditioned on labour market choices and possible imperfections, such as rationing.

Empirically, therefore, it is necessary to model the determinants of consumption in each of these portfolios, correcting for potential selection bias. We do so by the semi-parametric generalization of the Heckman correction proposed by Dahl (2002). This involves running the following empirical specification for each portfolio (i):

$$\log W_i = \log(C_i/Z) = x'\alpha_i + z_1'\beta_i + v_1'\gamma_i + \mu(p_{j \in P}) + \varepsilon_i \tag{12}$$

where W represents the welfare ratio aggregated to the household level (total household nominal consumption C, divided by the poverty line, Z), z_1 and v_1 are subsets of the vectors in (11), thereby providing non-parametric identification of the model, and $\mu(p_{j \in P})$ is an approximation to the expected value of the error term in the (uncorrected) consumption equation conditional on the prior selection process. The approximation we use is a polynomial series expansion of fitted probabilities from the multinomial logit step.[17]

Before proceeding to results, it is worth remarking on the choice of the household rather than the individual as the unit of analysis. Whilst labour market analysis in developed country contexts tends to be individualistic in nature, households tend to take centre stage in developing countries. This is for two principal reasons. First, as shown in Section 3 for Mozambique, a substantial portion of production is undertaken by household units, either on small farms or in informal household (micro) enterprises. In these cases, labour services are managed jointly by the household rather than by the individual in a market. Indeed, the latter tends to be the special case. Second, due to potential labour market imperfections (as discussed above) separability between production and consumption decisions should not be assumed *a priori*. Again, this points to focussing on pooled household-level decisions, rather taking individuals as independent decision-makers.

Finally, the subsequent analysis is based on estimates from a single pooled cross-section of the three surveys, including rural and urban areas. That is, we do not seek to provide survey- or

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[17]Further details available on request from the authors.

area-specific estimates. While the pooling assumption may be debatable, the Stylized Facts indicate broad stagnation in the labour market over time. Also, as the data is noisy and potentially subject to year-specific shocks, the larger number of observations helps more precise identification of parameters. Correspondingly, then, the estimates should be considered as parameter averages covering the past 15 years rather than being specifically relevant to any single point in time. However, to absorb time-invariant fixed effects, region- and survey-specific dummy variables are included in all regressions (not shown).

6 Results

6.1 A typology of jobs portfolios

Taking the three household living standards surveys together (i.e., pooled), we start by enumerating all possible household jobs portfolios based on four distinct types of activity (AH; NH; AW; NW; see Section 5.3), the relevance of which can be ascertained from the earlier descriptive analysis. The results are summarised in Table 11, which places the portfolios in order from most to least prevalent and provides summary statistics of consumption and asset poverty rates for households in each unique category (combination of activities).[18]

Two main points can be taken from the table. First, the vast majority of households are active in only one type of activity. That is, they appear to have adopted a corner solution in the portfolio space. By far the predominant portfolio is family agriculture, representing almost 53% of all households in the surveys (unweighted). Together such corner solutions, or single-activity portfolios, are pursued by 68% of households. Whilst the remaining households are active in more than one activity, it remains the case that less than 2% of households are engaged in 3 or more activities. Second, large welfare differences are associated with alternative portfolio choices. The starkest difference is between a pure family agriculture portfolio (first row) and a pure non-agricultural wage portfolio (third row). On both metrics, a household adopting the latter portfolio is at least half as likely to be poor. Similarly, non-farm household work also performs considerably better in welfare terms compared to pure family agriculture. This combination of: (i) a substantial concentration of households in single-activity jobs portfolios; and (ii) a clear welfare ranking of such portfolios, is potentially consistent with the conceptual framework developed in Section 5, whereby labour market distortions ration households out of preferred labour market choices. However, this is not the only plausible explanation. For example, differences in household endowments, such as education, may well be driving the observed sorting process such that it is not labour market imperfections *per se* that play a critical explanatory role.[19]

On this basis, it is appropriate to continue to the next step of the analysis. To do so it is helpful to simplify (collapse) the portfolio space from 16 to a smaller number of distinct jobs portfolios. We select four, reported in the final column of Table 11, which are denoted by the following

---

[18]Consumption poverty rates are the official national poverty numbers calculated from the same surveys; Asset poverty is a multidimensional index on the form of Alkire and Foster (2011) where a household is deemed poor it is deprived in more than 5 of 7 dimensions, which cover human and physical asset ownership at the household level.

[19]Imagine that household's choose to undertake wage labour at a rate that reflects their productive capacity. If these productive capacities are very low, the corresponding wage offer may also be very low, meaning that they are indifferent between wage labour and (low-productivity) household agricultural production. In this case, then, the observed sorting pattern would substantially reflect low levels of human capital (e.g., in the rural economy).

Table 11: Enumeration of household jobs portfolios, based on four activity types

| % obs. | Activities | Activity types | | | | Poverty rates | | Portfolio |
		AH	NH	AW	NW	Consump.	Asset	
52.66	1	1	0	0	0	63.8	87.5	Ag
13.43	2	1	1	0	0	57.1	74.9	AgNf
9.28	1	0	1	0	0	51.6	55.7	NfE
7.13	2	1	0	0	1	56.4	47.2	AgNf
6.19	1	0	0	0	1	37.1	16.2	NfW
4.23	2	0	1	0	1	44.5	19.2	NfE
3.10	0	0	0	0	0	49.3	57.8	-
1.41	2	1	0	1	0	68.0	76.8	Ag
1.31	3	1	1	0	1	56.3	39.9	AgNf
0.38	3	1	1	1	0	66.1	56.8	AgNf
0.29	1	0	0	1	0	58.5	56.1	Ag
0.24	2	0	1	1	0	45.9	47.4	AgNf
0.13	3	1	0	1	1	41.0	34.3	AgNf
0.08	4	1	1	1	1	34.0	31.7	AgNf
0.07	3	0	1	1	1	53.2	60.9	AgNf
0.06	2	0	0	1	1	64.3	9.5	AgNf

Notes: activity types are household (family) agriculture (AH), household non-farm occupations (NH), wage labour in agriculture (AW), and non-farm wage labour (NW); '% obs.' gives the proportion of households from the pooled series of household surveys (1996/97, 2002/03 and 2008/09) which correspond to the specific combination of activities enumerated in each row; 'Activities' indicates the number of unique activities in which the household is engaged, ranging from zero to four; consumption and asset poverty rates for each group of households are reported in the third- and second-to-last columns; 'Portfolio' maps each unique combination of activities to a summary category (see text for description).
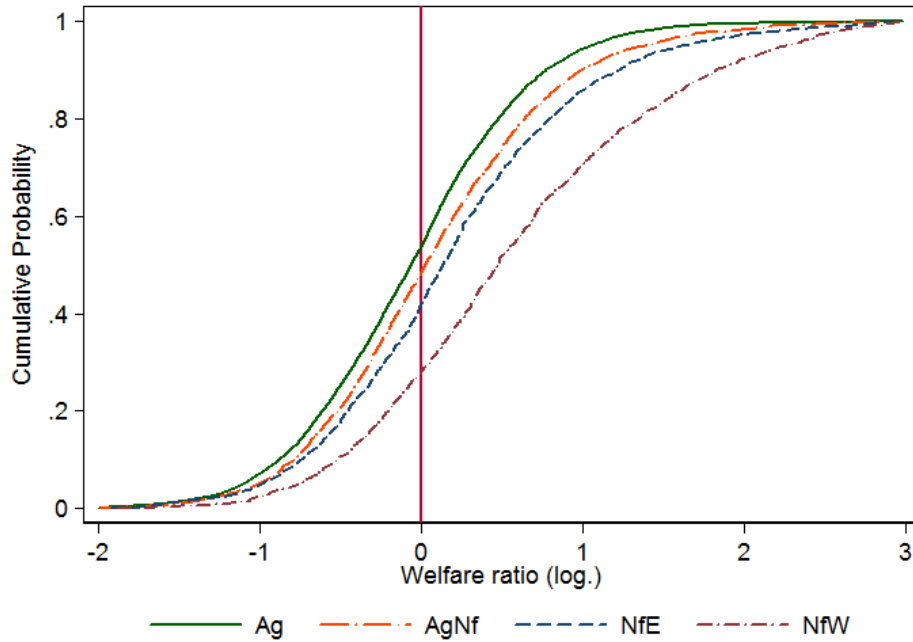
Source: authors' calculations from household survey series.

abbreviations hereafter: "Ag" - households active only in agriculture (either through family or wage labour); "AgNf" - households that mix agriculture and any non-farm activity;[20] "NfE" - households that contain a non-farm enterprise *and* no agriculture, some (but not all) household members may also be engaged in non-farm wage labour; "NfW" - all household workers are wage labourers in non-farm activities. We discard the single portfolio in which there are no working household members. These are not immaterial, as around 6% of all households fall into this category, but they are a special case because they must receive all income from non-labour activities (or savings). Thus, to simplify the analysis we focus only on working households.

Reflecting the welfare differences between the original 16 portfolios, the four 'collapsed' jobs portfolios can also be ranked according to standard welfare metrics. This is shown in Figure 15 which plots the cumulative distribution of the natural logarithm of consumption per capita normalised by the poverty line (otherwise known as the welfare ratio), meaning households with values above zero are considered non-poor on a headcount poverty measure. Visual examination of the figure indicates that the portfolios observe first order stochastic dominance conditions. That is, portfolio NfW stochastically dominates portfolio NfE, which stochastically dominates portfolio AgNf, which in turn stochastically dominates portfolio Ag. More simply, at any given percentile $0 < X < 100$, the poorest $X\%$ of households with a wage labour portfolio (NfW) are on average better off than the poorest $X\%$ of the non-farm household enterprises (NfE), and so on. Thus, the Ag portfolio yields lower expected welfare outcomes than any of the other portfolios. At the same time, there is considerable variance in outcomes in all of the portfolios. All portfolios contain both poor- and non-poor households; therefore, there are agricultural households (Ag) with welfare outcomes that are superior to wage labouring households. Thus, a wage labour portfolio does not unconditionally guarantee higher welfare outcomes. A corollary is that there are many comparatively highly productive informal sector jobs, particularly in the non-farm enterprise sector.

Before proceeding, given that the results in Table 11 refer to the pooled household survey dataset, it is informative to examine whether the prevalence of different portfolios has changed over time. This is indicated in Table 12, which distinguishes between rural and urban locations. Three points standout. The first is that the exclusive wage labour portfolio (NfW) has remained stable as a share of households over time across all locations. Second, possibly reflecting a more dynamic process of rural change than was revealed in Section 4, there has been a shift of household out of pure household agriculture and into non-farm (non-wage) activities. Thus, non-farm household enterprises have grown from 0.7% to 13.2% of rural households over the 1996/97 - 2008/09 period. Third, similar but somewhat slower growth of non-farm household

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[20]Note that the definition of non-farm activity includes commercial livestock farming - i.e., selling either animal produce or live animals in the market. Strictly this could be considered agriculture, but the data reveals this is a higher value activity and it is therefore helpful to introduce this distinction to provide more nuanced differentiation between households, particularly in rural areas.

Notes: jobs portfolios are Ag, AgNf, NfE, & NfW as defined in the text; CDFs estimated using a Gaussian kernel; figure excludes extreme values; observations above zero (x-axis) indicate non-poor households.

Source: authors' calculations from household survey series.

Figure 15: Estimated cumulative distribution functions of (per capita) welfare ratio, by jobs portfolio

Table 12: Prevalence of household jobs portfolios, by survey and location

	Survey	Ag	AgNf	NfE	NfW
Urban	96/97	26.5	32.1	22.1	19.3
	02/03	26.2	28.8	25.8	19.2
	08/09	25.5	24.2	30.6	19.8
	Δ	-1.0	-8.0	8.5	0.5
Rural	96/97	77.0	21.7	0.7	0.5
	02/03	69.8	20.3	9.2	0.6
	08/09	63.0	22.8	13.2	0.9
	Δ	-14.0	1.1	12.5	0.4

Notes: portfolios are derived from Table 12; Δ gives the absolute change between 2008/09 and 1996/97 for each portfolio (in each location).
Source: authors' calculations from household survey series.

enterprises also has been registered in urban areas, meaning they now represent the portfolio of choice for almost a third of all urban households. This underpins the importance of discarding the view that the informal sector is only comprised of homogenous, low-productivity activities but rather can be an important source of growth and dynamism.

6.2   Selection into jobs portfolios

Retaining the focus on the four main jobs portfolios (potential segments) retained in the previous section, we perform the multinomial logit analysis based on the latent utility specification in equation (11). Motivated by the simulation-type approaches employed elsewhere (e.g., Abowd and Killingsworth, 1984), we estimate alternative models, applying different restrictions on the set of included explanatory variables. This helps to gauge which sets of explanatory variables drive changes in the estimated probability of a household choosing a specific portfolio. Specifically, we build-up sequentially to the full model and estimate portfolio selection propensities for the model: (I) including specific taste shifters, rural/urban location and survey dummy variables;[21] (II) adding human capital variables (experience and education); (III) adding household physical capital assets; (IV) adding the full set of demographic composition variables (number of workers and gender ratios); and (V) adding the set of external conditions including location dummies, thereby giving the full model.[22]

For each of these models (I)-(V), Table 13 reports the share of households in each segment that are allocated correctly, meaning that the portfolio given the highest probability under the model corresponds to the household's actually observed segment (and this probability is at least 50%). The results from this exercise are highly informative. The first point to note is that even the most restrictive model correctly allocates virtually all ($\approx 90\%$) pure agricultural households (Ag) to the correct labour market portfolio. This is hardly surprising – this portfolio is the most prevalent in the data (in each survey), and is especially dominant in rural areas. However, the fact that the inclusion of other variables (models II onwards) does not alter the goodness of fit for this category, but does for the portfolios, indicates that allocating all labour to agriculture essentially amounts to a residual or default strategy. This is would imply that household agriculture remains a low-productivity, low-returns activity and is one which households prefer to exit if they can accumulate human and physical capital assets to engage in off-farm work.

Turning to the other portfolios, the fundamental insight from the table is that the inclusion

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[21]These taste shifters are access to non-labour income, the number of children under 7, and the dependency rate.

[22]Note that the results from this procedure are sensitive to the order in which the variables are added. Nonetheless, the order of inclusion is motivated by our interest in identifying whether household endowments (and preferences) are sufficient to explain observed portfolio choices, or whether external constraints are also important. Thus, the latter variables enter last.

of human capital variables (model II) is most informative for the choice of (pure) wage labour portfolio, yielding a large jump in the goodness of fit measure for this category (from 28% to 54%). That is, education or experience represent critical pre-conditions for securing wage work. In contrast, ownership of specific productive assets (model III) appears to be a more critical precondition for both of the household enterprise portfolios that include non-farm activities (AgNf and NfW). This may be symptomatic of the existence of asset accumulation traps, whereby (Ag) households are simply unable to generate sufficient savings (or gain access to credit) that enable them to purchase productive equipment and move into higher-returns non-farm work. Addition of the remaining variables (models IV and V) generates minimal changes in all categories, the exception being the addition of demographic variables for the pure wage portfolio. Overall, this suggests that observable household endowments explain the bulk of labour market sorting patterns in Mozambique. This does not discount the existence of labour market challenges, but in the minimum suggests that any such challenges are correlated with average endowments in different portfolios. A candidate example would be the restriction of (new) wage labour opportunities to those above specific education thresholds (discussed further below).

Table 13: Goodness of fit estimates for alternative utility function specifications (models), by portfolio

| | Model | | | | |
Portfolio	I	II	III	IV	V
Ag	88.4	91.7	88.9	89.1	89.8
AgNf	19.3	26.4	38.6	40.3	42.1
NfE	21.9	17.0	36.0	38.8	43.8
NfW	27.9	54.1	53.4	63.8	63.0
ALL	59.4	63.9	67.7	69.2	70.7
F-stat.	89.0	87.9	87.3	72.0	52.5
prob.	0.00	0.00	0.00	0.00	0.00

Notes: portfolios are as described in the text, see Table 11; for each portfolio (and all households), cells indicate the proportion of households observed to have selected that portfolio that are predicted to do so by a given multinomial logit model (columns I-V); multinomial logit models build-up the specification sequentially; column (I) includes only specific taste shifters, rural/urban location and survey dummy variables; col. (II) adds human capital variables; col. (III) adds household physical capital assets; col. (IV) adds the full set of demographic composition variables; and col. (V) adds the set of external conditions including location dummies, yielding a full model; final two rows report overall model summary statistics.
Source: authors' calculations from household survey series.

The results from the preceding analysis can be refined by a more detailed review of the results from the full model (V). These are summarised in Table 14, showing only a selection of the

Table 14: Summary of multinomial logit estimates, by portfolio

	Rural				Urban			
	Ag	AgNf	NfE	NfW	Ag	AgNf	NfE	NfW
Household head female	-0.02	-0.04***	0.05***	0.01***	-0.02***	-0.07***	0.03*	0.06***
Household head literate	-0.04***	0.03***	0.01	0.00***	-0.03***	0.01	-0.03*	0.05***
Log working members	-0.02	0.06	-0.01	-0.02***	0.01	0.10***	0.15***	-0.27***
Log non-workers (>6)	-0.09***	0.08***	0.02	0.00	-0.06***	0.06***	0.02	-0.02
Adult males (% workers)	-0.15***	-0.01	0.14***	0.02***	-0.14***	-0.11***	0.06	0.18***
Young males (% workers)	-0.12***	-0.06**	0.16***	0.02***	-0.12***	-0.15***	0.11***	0.16***
Adult females (% workers)	0.01	-0.05**	0.04**	0.00	0.00	-0.07***	0.06*	0.00
Experience	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Experience squared	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Education	-0.02***	0.02***	0.00***	0.00	-0.02***	0.02***	-0.01	0.01
Education squared	-0.00*	0.00	0.00	0.00***	-0.00**	-0.00*	0.00	0.00***
Asset: radio	-0.03***	0.02***	0.00	0.00	-0.02***	0.02*	0.00	0.01
Asset: telephone	-0.05***	0.01	0.04***	0.00***	-0.04***	-0.01	0.03*	0.03***
Asset: land	-0.03	0.09***	-0.06***	-0.00**	-0.01	0.11***	-0.08***	-0.02
Asset: livestock	-0.40***	0.17***	0.23***	0.00**	-0.29***	0.03***	0.30***	-0.04**
Asset: transport	-0.04***	0.06***	-0.02**	-0.00***	-0.02***	0.06***	-0.01	-0.03***
Non-labour income	0.00	0.00	0.01	-0.00***	0.00	0.00	0.03**	-0.04***
Region: access to transport	0.10	-0.02	-0.08	0.00	0.07	0.01	-0.16	0.08
Region: access to electricity	-0.42**	0.18	0.25**	0.00	-0.30**	0.06	0.39**	-0.15
Region: access to radio	-0.02	-0.13	0.16**	-0.01	-0.02	-0.16*	0.33***	-0.15**
Region: % AgNf households	-0.62***	0.68***	-0.08	0.02**	-0.41***	0.56***	-0.36*	0.22**
Region: % NfE households	-0.81***	0.18	0.63***	0.00	-0.60***	-0.13	0.89***	-0.16
Region: % NfW households	-0.19	0.31**	-0.15	0.04***	-0.16	0.24	-0.56**	0.48***
Region: specialization	0.04	0.14	-0.19**	0.01	0.04	0.18*	-0.39***	0.17*
Rural (dummy variable)	-0.05	0.00	0.06*	-0.00*	-0.03	-0.02	0.13***	-0.08**
Obs. (AME)	5,256	5,256	5,256	5,256	4,682	4,682	4,682	4,682

Notes: the table reports average marginal effects (AMEs) calculated for urban and rural subgroups separately, based on the same underlying regression estimates; for each jobs portfolio indicated (columns), only households included in the 2008/09 survey are employed to calculate the AMEs; selected coefficients shown; standard errors account for survey design (e.g., clustering etc.).
Source: authors' calculations from household survey series.

coefficients.[23] To aid interpretation, the table reports average marginal effects (AMEs), which are the sample average of individual marginal effects for chosen subgroups. In the present case, the subgroups we choose are distinguished between rural and urban locations (thus reported separately). Also, for each portfolio and location, we focus only on households in the sample from the latest survey round.

What do these results tell us? Consistent with earlier results, as well as the welfare ranking of portfolios (Section 6.1), a key finding is that there are few factors that pull households into the agriculture portfolio (Ag) in the sense of making it an attractive, positive choice. Rather, ownership of assets (e.g., education, livestock, telephone, transport) reduces the propensity of households to choose pure agriculture. We also see that larger households, and particularly those with more male workers (either adult or youth), are less likely to prefer to adopt this portfolio. A new insight is that the proxies for local labour market conditions appear to exert a comparatively strong influence on the likelihood of choosing an agricultural portfolio. Small increases in the proportion of households engaged in other portfolios, which can be interpreted as proxying an increase in the availability of outside opportunities, drives down the propensity to choose a pure agriculture portfolio. For example, a 10% point increase in the proportion of households engaged in a non-farm enterprise reduces the propensity to select the Ag portfolio by around 8% points in rural areas, and 6% points in urban areas. This again indicates that the Ag portfolio often is a default or residual choice, driven both by low levels of asset accumulation but also by a scarcity of outside options including low levels of local economic diversification.

As expected with respect to the other portfolios, the greater the share of households in the region that are observed in a given portfolio, the higher the propensity for any given household to choose the same. This is consistent with spatial concentration of labour (see Stylized Fact 7) as well as with peer-effects such as imitation and social learning. Interactions between portfolios are also relevant. For example, in urban areas the more wage jobs there are, the lower is the propensity for households to run a household enterprise. This suggests that the latter may be a constrained response where wage work is scarce. External factors are also material in the guise of local productive conditions (regional measures of access to transport etc.). These exert a strong positive effect on the propensity to select the NfE portfolio, suggesting that there can be particularly large benefits to household enterprises from (higher quality) public infrastructure such as electricity and communications.

Concerning the results for the other portfolios, a few points can be highlighted. Gender and demographic variables affect the propensity to select *all* the portfolios, in both rural and urban areas, but in a relatively complex way. In urban areas, having a larger household works in favour of selecting either the AgNf or NfE portfolios but works against selecting against the NfW

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[23]Full details available on request from the authors.

portfolio. This could be indicative of various mechanisms including high urban transport and housing costs that push larger families out of the urban core (where wage opportunities are more prevalent) and into the urban periphery, but also that access to a high quality wage job can allow extended, multi-generation households to split into their respective core family units rather than pool their labour and household costs. With respect to gender, there is a clear tendency of young males to prefer non-farm work, particularly in urban areas where wage work (and other non-farm) opportunities appear to be strongly skewed towards men. One explanation for this effect is that as household duties such as childcare tend to fall exclusively on Mozambican women, this can limit their availability to pursue fulltime work outside the home (unless they can afford to hire-in a child carer, which is very common among better-off households).

Human capital also affects the portfolio choice propensities in different ways. For the (higher welfare) NfE and NfW portfolios, education tends to exhibit a profile that is convex to the origin, meaning that the value of an additional year of education is larger the more education the household already has (on average). More straightforwardly, low levels of education have a small positive effect on the propensity to select a non-farm portfolio. Due to the non-linearity in these estimates, it is only at higher levels of education that these propensities are more substantial, which is indicative of entry-thresholds as well as higher technological requirements in these portfolios. Experience, in contrast, has no effect on portfolio choices.

The evidence of this section leads to two main conclusions. First, observed household endowments of human and physical capital play a fundamental role in observed labour market sorting patterns. Accumulation of human and and physical capital assets are key predictors of engagement in non-farm work. Thus, we cannot ascribe Mozambique's absence of labour market transformation purely to labour market distortions. However, and second, external labour market conditions do matter. In particular, there is evidence that opportunities to pursue non-farm work are limited by scarce outside options and a lack of access to public goods. This close linkage between (low productivity) agriculture, weak external conditions and persistent poverty is indicative of the operation of poverty trap mechanisms of some kind.

6.3 Conditional determinants of welfare

The previous subsection considered the determinants of selection into different labour market segments. The next step is to investigate whether these choices have material welfare implications. Following the methodology outlined in Section 5, observed welfare outcomes are determined on labour market choices which may or may not be subject to constraints. Thus, due account must be made of (unobserved) and prior labour market sorting processes. To do so, we run separate regressions of the determinants of welfare for each of the four portfolios, where the dependent

variable is the natural logarithm of the welfare ratio (total household consumption divided by the poverty line).[24] To address selection bias we include a polynomial expansion of fitted probabilities from the multinomial logit analysis (a type of first stage regression) as additional explanatory variables. Non-parametric identification of the model is achieved by excluding a small number of variables used in the first stage from this second or outcome stage regression. The variables excluded are explicitly chosen as they are expected to uniquely affect the prior choice of labour allocation (jobs portfolio) but should not have a direct effect on household returns. Specifically, variables excluded from the second stage regression are certain household characteristics regarding non-workers (specifically, the number of children aged under 7 and the dependency ratio) as well as the second and third sets of the labour market conditions proxies. However, we include the Herfindahl concentration index, as there may be pecuniary externalities associated with the extent of labour market specialization.

The results of these regressions are reported in Table 15, which again focuses only on selected coefficients.[25] As suggested from the previous step, demographic composition matters. As expected, additional household workers directly increase household consumption. The coefficients on 'log working members' in fact provide direct estimates of productivity differences between alternative portfolios, holding all other effects fixed – being approximately equivalent to the effect of a young female member of the family with no education or prior labour market experience entering the work force. We see that for the agriculture portfolio (Ag), the addition of one more worker increases the log welfare ratio by 0.17 points, which is the lowest of all portfolios; the highest contribution is in non-farm household enterprises (NfE) where the log welfare ratio is expected to increase by 0.56 points (these coefficients are also the elasticity of consumption with respect to workers in different portfolios). However, with the exception of Ag, there is in fact no statistical difference between the coefficients on the number of workers across the remaining portfolios. This would suggest that there is no unconditional benefit from choosing the wage labour portfolio relative to other non-farm portfolios. Put differently, informal activities *can be* equally productive as wage labour.

Other demographic effects are relevant. The contributions of non-working members, which can be interpreted either as a time effect on existing workers or a direct (unpaid) contribution of these members, is positive in most cases, but generally lower than the contribution of working members. The exception is the Ag portfolio where the two effects are approximately the same (statistically speaking), which is again indicative of low returns in agriculture per se. We also see a negative effect of a larger share of young men in the household work force (relative to a

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[24]In order to clearly model the relationship between demographic composition (e.g., number of workers) and household consumption, we do not normalise household consumption by household size *ex ante*. Rather, we let the data speak for itself. However, for *ex post* poverty calculations we adjust for household size by dividing total estimated household consumption by the number of household members.

[25]Full results are available from the authors on request.

Table 15: Selection-bias corrected analysis of welfare determinants, by jobs portfolio

| | Ag | AgNf | NfE | NfW |
	I	II	III	IV
Household head female	-0.04	-0.10**	0.07	0.04
	(0.02)	(0.04)	(0.05)	(0.07)
Household head literate	0.05**	0.05	0.17***	0.27***
	(0.02)	(0.04)	(0.05)	(0.07)
Log working members	0.17***	0.48***	0.56***	0.51**
	(0.06)	(0.09)	(0.08)	(0.21)
Log non-workers (>6)	0.28***	0.34***	0.31***	0.17***
	(0.02)	(0.04)	(0.04)	(0.04)
Young males (% workers)	-0.28***	-0.23**	0.09	-0.00
	(0.06)	(0.11)	(0.09)	(0.13)
Experience	0.00	0.01*	0.03***	0.02**
	(0.01)	(0.01)	(0.01)	(0.01)
Experience squared	-0.00	-0.00	-0.00	-0.00
	(0.00)	(0.00)	(0.00)	(0.00)
Education	-0.01	0.06***	0.03	0.03
	(0.01)	(0.02)	(0.02)	(0.03)
Education squared	0.00	0.00	0.01***	0.00***
	(0.00)	(0.00)	(0.00)	(0.00)
Asset: radio	0.13***	0.19***	0.07	0.02
	(0.02)	(0.03)	(0.04)	(0.04)
Asset: telephone	0.31***	0.47***	0.58***	0.48***
	(0.05)	(0.05)	(0.04)	(0.05)
Asset: transport	0.20***	0.26***	0.27***	0.40***
	(0.03)	(0.03)	(0.04)	(0.05)
Region: access to transport	1.28***	0.90***	0.56	0.18
	(0.18)	(0.28)	(0.38)	(0.44)
Region: access to electricity	0.01	-0.97*	0.06	1.41***
	(0.42)	(0.52)	(0.47)	(0.54)
Region: specialization	-0.45**	-0.29	0.46	1.30***
	(0.22)	(0.29)	(0.31)	(0.40)
Obs.	13,632	5,358	3,968	2,828
F-stat.	50.56	33.57	34.22	30.97
R2	0.29	0.37	0.48	0.49
Human capital terms (prob.)	0.00	0.00	0.00	-
Selection bias terms (prob.)	0.00	0.01	0.10	0.03

Notes: columns report selected coefficients from separate OLS regressions for determinants of the log. welfare ratio (total nominal household consumption / poverty line) for each observed household jobs portfolio; selection bias terms, generated from results in Table 14, are included but not shown; however, their joint significance is reported in the final row; standard errors in parentheses reflect the survey design.

Source: authors' calculations from household survey series.

base case that all workers are young women), but this occurs only in the portfolios involving agricultural work (Ag and AgNf). This is consistent with evidence found elsewhere in Africa of an absence of role models for young men in agriculture, meaning it is frequently perceived as a low status, undesirable occupation (reflecting its low average level of productivity) in turn leading to a low labour contribution – e.g., as they search for other jobs elsewhere.

Additionally, returns to durable assets and local (public) goods vary across the portfolios, reflecting their differential relevance. Notably, access to transport generates substantial returns in the agricultural portfolios – indicative of the key role of rural infrastructure to address low agricultural productivity. However, returns to electricity are highest in wage jobs, which may be due to the location of higher quality wage jobs in locations with better infrastructure. Similarly, there are agglomeration benefits in wage work. This is revealed by the positive coefficient on the Herfindahl concentration index. Given the considerable spatial concentration in jobs portfolios (see Stylized Fact 7), an interpretation is that where there is a thicker wage labour market, average real wages tend to be higher. On the contrary, in agriculture (Ag), the greater the concentration in portfolios (i.e., of other Ag households) the lower the average returns. Again, this is indicative of low productivity, (spatial) poverty trap processes in rural areas.

Returning to the hypothesis of labour market segmentation (see Section 5), it is helpful to test for the equality of coefficients on the core human capital variables across the portfolios. Taking the wage portfolio as the reference (recall that the under a null hypothesis of no segmentation, the shadow price of labour is equal to the market wage), the penultimate row of Table 15 reports joint Wald tests for coefficient equality on the human capital terms.[26] The differences are statistically highly significantly, indicating that labour's marginal product is not equalised across portfolios or that labour market constraints are likely to operate in some form. Looking more closely, the pure agricultural portfolio shows zero returns to experience *and* zero returns to education. In the mixed agricultural and non-farm portfolio (AgNf), we find relatively robust linear returns to education (6% increase in household consumption for each additional average year of education among the household's workers) and experience. Among non-farm household enterprises, there returns to experience are higher (and linear), but returns to education are concave. For wage labour, we also find (slightly lower) concave returns to education but also linear returns to experience.

To get a better sense of these differences with respect to education, Figure 16 plots the resulting profile of returns to education for each of the different portfolios based on the estimated coefficients (statistically insignificant coefficients are given a zero). Importantly, this takes into account any trade-off between experience and education, as per the definition of experience described in Section 5.3. Specifically, then, the incremental return to years of schooling (s) in

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[26]These are the number of workers, their gender composition and the experience and education terms).

portfolio i is calculated as:

$$r_i = \alpha_{1i}s + \alpha_{2i}s^2 + \beta_{1i}(7-s) + \beta_{2i}(7-s)^2 \qquad (13)$$

and where the parameters are taken from the corresponding regression estimates and the final two terms assume potential labour market experience of 7 years (before schooling). At zero years of schooling the difference between the portfolios thus represent pure differences in returns to experience – these are small but are zero for the agricultural portfolio. Moving along the x-axis simulates the expected impact from additional years of education and thus fewer years of accumulated experience. The flat profile of most portfolios in the figure at low levels of education (less than around 7 years, or a full primary education), thus indicates that effective returns to an additional year of education are close to zero. Alternatively, there is no trade-off between schooling and experience at these levels. Equally, fixing all other coefficients to be the same, there is no particular advantage for an agricultural household with a relatively low level of education to adopt the wage portfolio. The exception is the AgNf portfolio – its linear returns schedule in schooling and low returns to experience ensures that even small investments in education payoff. However, at higher levels of education, the exclusively non-farm portfolios become superior; and non-farm enterprises yield the highest returns after approximately the conclusion of secondary school. This supports the view that not all informal activities generate low returns; nonetheless, outside of agriculture, more substantial welfare benefits only tend to accrue beyond primary school.[27]

Finally, it is worth remarking that the estimates on the variables included to address selection bias are (jointly) significant for all portfolios excluding NfE. This is reported in the final row of Table 15, also based on a joint Wald test. In the three cases where they are significant, coefficients on the remaining variables are not equivalent in regressions including and excluding the selection bias terms. Overall, therefore this analysis supports the conclusion that Mozambique faces significant challenges in the structure of its labour markets. On the one hand, the majority of labour is found in low-productivity, low-returns agriculture. This is explained both by low levels of accumulation of human and physical assets, but also by the absence of wage offers to unskilled labour. That is, the evidence is strongly suggestive of labour market sorting according to education and productive asset thresholds (which enable access to non-farm activities). On the other hand, where they are available, non-farm informal jobs are crucial sources of dynamism and growth.

The findings of this section therefore echo those of Section 6.2. On the one hand, material differences in expected welfare outcomes between households can be traced to differences in

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[27]The finding of low returns to schooling in low productivity sectors, such as agriculture, is not new and accords with previous research for low income countries, including those in Africa. See, for example Gurgand (1997); Pritchett (2001); Weir and Knight (2007).
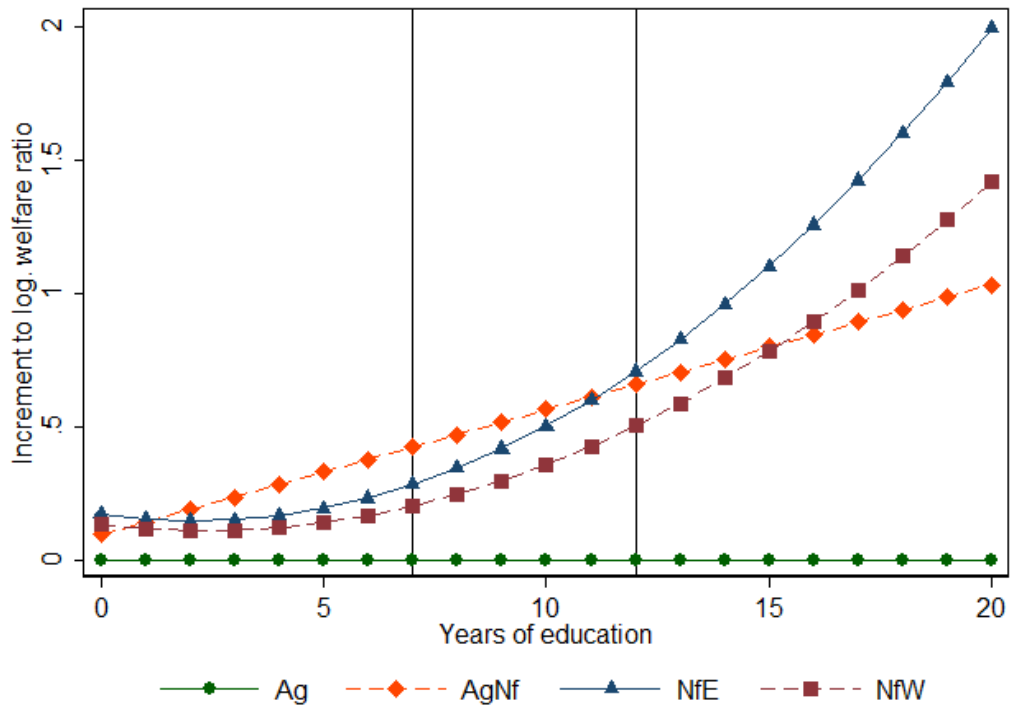
Notes: jobs portfolios are Ag, AgNf, NfE, & NfW as defined in the text; estimates based on the education and experience regression coefficients shown in Table 15 for the mean working age in the sample; statistically insignificant coefficients valued at zero; dependent variable is the log welfare ratio; vertical lines represent the conclusion of primary and secondary schools (7 and 12 years respectively).

Source: authors' calculations from household survey series.

Figure 16: Estimated incremental returns to education, by jobs portfolio

their endowments (correcting for selection bias). Very low levels of education in particular limit the ability of households to gain from any kind of activity. Thus, inefficiencies in factor allocation cannot explain the persistence of poverty in Mozambique. On the other hand, labour's marginal product is not equalised across activities and external labour market conditions matter. Demand-side constraints appear to be most material, which is consistent with the findings of a very low marginal product of labour in agricultural activities relative to other activities. Additionally, the evidence here underlines the existence of productive and dynamic informal sector jobs, particularly in non-farm enterprises, where returns to education can be very high.

7 Jobs simulations

7.1 Methodology

To provide additional guidance as to the policy implications of our analysis, we now move to a simple set of simulations. These are useful because the regression coefficients estimated in Section 6.3 do not (directly) indicate the expected aggregate welfare impacts associated with either individual or joint changes in the explanatory variables (e.g., changes in endowments or returns to these endowments). Put differently, the regression analysis does not indicate the welfare costs associated with labour market imperfections that we see in the data, such as demand-side constraints. Consequently, simulations can be useful to think through the implications for welfare of loosening some of these labour market imperfections, albeit in a highly stylized fashion. In other words, such simulations allow us to answer the important question: if households were (freely) able to sort into that jobs portfolio which yielded the highest economic returns, what would be the first-order effect on social welfare?[28]

In order to implement these simulations we proceed as follows: first, for each household in the sample, we predict the expected value of the log welfare ratio under each alternative jobs portfolio (including the observed portfolio). These are just the predictions from the estimated welfare outcome regressions, based solely on their deterministic terms corrected for selection bias. Next, we compare these expected values across portfolios. If the highest value is associated with the household's observed portfolio, then we conclude the household has no incentive to switch jobs. However, if the largest expected value is significantly greater than the expected value under the observed portfolio (i.e., taking into account variation in the estimated regression coefficients), we say that the household would prefer to move to this alternative portfolio.[29] On this basis we can calculate aggregate welfare in three alternative regimes. Under the first regime the household is allocated the predicted value from the regression associated with its observed regime, (the in-sample predictions), which corresponds to labour market imperfections remaining fixed. Under a second regime we take the expected value of consumption permitting all households to switch who wish to do so (as per the above conditions) – this is denoted 'flexible' and can be read as an upper limit on the potential benefits that may accrue to addressing labour market constraints.[30] Finally, as a middle ground, we allow 20% of households who wish to switch to do

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[28]The effects are first-order in nature as they do not take into account general equilibrium effects, such as changes in the returns to different activities, which would be expected to move with shifts in labour supply.

[29]The underlying assumption here is that preferences for leisure are unchanged such that we assume there is no change in the household composition or allocation of members to work/non-work under different portfolios. Consequently, under standard properties of a general utility function, more consumption is preferred to less and utility is strictly increasing in consumption. A further assumption is that households do not factor in any changes in aggregate labour market conditions (i.e., general equilibrium effects), such that observed returns in other portfolios are assumed to hold.

[30]Households which prefer not to switch are allocated the expected consumption under the fixed regime.

so, selected as those with the greatest distance between expected consumption under the fixed and flexible regimes (thereby having the highest incentives to switch). To each expected value (in each regime) we add a white noise error term to reflect unexpected, stochastic determinants of household consumption such as health or weather shocks. These are based on the standard deviation of the in-sample residuals from the original outcome regressions. From these total fitted values we can calculate a variety of welfare metrics, including headcount poverty rates as well as inequality measures. For simplicity, we focus only on the headcount poverty rate here.

The above simulations refer to changes in labour market conditions and, specifically, the ability of households to adopt potentially welfare-improving jobs portfolios. As a complement, we also include a set of more specific policy measures aimed directly at the agricultural sector where, as we have seen, welfare generally is lowest. In each case the policy scenarios are implemented either by making alterations to household characteristics, or by fixing the regression coefficients at (preferred) values. Based on these changes, alternative predicted values for the welfare measure are generated. Four different policy scenarios are run, these are: (1) "baseline" – no changes to household characteristics or regression coefficients; (2) "Education" – we increase the average years of education by 5 years for a random selection of rural households with an average education level below 7 years and also increase the returns to education in agriculture to 5% per year (linear); (3) "Infrastructure" – we improve access to transport, electricity and communications infrastructure for a random selection of rural PSUs, we raise returns to the same electricity and news communications infrastructures, and set the agglomeration effects to zero (from negative) for households selecting the Ag portfolio; and (4) "Combined" – is the combination of the second and third packages.

7.2 Results

Table 16 presents the principal results from the four scenarios under each of the three labour market regimes (fixed, rationed, flexible), and where the predicted headcount poverty rate is calculated separately for rural and urban households.[31] The baseline scenario essentially represents an approximation to the current situation in which there are no specific policy changes and households are retained in their observed jobs portfolios. The approximation is good, as there is no statistical difference between actually observed (final row) and predicted poverty rates in this case. Horizontal movements across the table capture the effects of loosening labour market imperfections in the current environment. Movements vertically down the table entail shifts between the different policy scenarios.

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[31]To enhance their current relevance, only households from the 2002/03 and 2008/09 surveys are employed within these simulations.

A principal finding is that the welfare implications of addressing labour market imperfections are significant but not transformative. In the baseline policy scenario, if a fifth of households who wish to switch to welfare-improving portfolios are able to do so, then the rural poverty rate would fall by around 7 percentage points and 11 points under the flexible scenario (where all can shift if they so wish). The expected reductions in poverty are of a similar absolute magnitude for urban households, and remain consistent (but somewhat smaller) across the different policy scenarios. The conclusion is that labour market segmentation, which may prevent households from shifting to welfare-enhancing jobs, explains a small share of observed poverty, but not its bulk. This accords with the previous section which highlighted the low level of human and physical capital across the economy, especially in rural areas. The point is that taking the scarcity of productive endowments as given, simply enabling households to select other jobs is unlikely to lead to dramatic welfare improvements.

Turning to differences between the various rural policy packages (vertically), gains from any individual package are moderate but compare favourably with the effects of loosening labour market constraints. The education package, for example, would generate a 9 percentage point fall in the predicted poverty rate. This comes about through both an increase in the stock of education as well as a corresponding increment in returns to education, for example through access to new technology. Larger gains obtain from the infrastructure package, and combining the two packages yields a predicted reduction in the poverty rate of around 22 percentage points leaving labour market distortions unchanged.

We now move on to reflect on the policy implications of these results.

Table 16: Predicted household consumption poverty headcount rates under alternative labour market scenarios

Portfolio choice constraints →	Fixed		Rationed		Flexible	
Policy scenario ↓	Rural	Urban	Rural	Urban	Rural	Urban
Baseline	56.1	49.5	49.1	42.9	44.5	38.6
	(0.75)	(1.01)	(0.79)	(1.02)	(0.84)	(1.08)
Education	46.8	46.8	41.7	42.3	38.5	37.1
	(0.86)	(0.98)	(0.80)	(0.88)	(0.81)	(0.89)
Infrastructure	39.3	42.1	33.7	40.0	30.0	34.6
	(0.86)	(1.03)	(0.89)	(0.98)	(0.88)	(0.91)
Combined	33.9	43.1	28.8	41.7	25.6	34.1
	(0.77)	(0.95)	(0.72)	(0.95)	(0.68)	(0.86)
Observed poverty headcount	56.3	50.5	-	-	-	-
	(1.23)	(1.42)				

 Notes: cells report estimated consumption poverty rates and corresponding standard errors (in parentheses) based on the regression estimates in Table 15; 'Portfolio choice constraints' refer to the degree to which household are constrained in selecting welfare-improving alternative jobs portfolios; policy scenarios apply alternative hypothetical policy packages focusing on the rural sector (see text for details).
 Source: authors' calculations from household survey series.

8 Policy implications

8.1 Challenges and trade-offs

The empirical analysis has provided a number of insights about the functioning of the Mozambican labour market. Four principal conclusions can be drawn, each of which maps to a specific jobs challenge. First, there is a consistent association between low-productivity agriculture, viewed often as a default jobs portfolio, and persistent poverty. This can be traced to weak household endowments, demand-side weaknesses and threshold effects (entry barriers) to higher-return, non-farm occupations. From a policy perspective, careful interpretation must be given to these findings. Despite the importance of supply-side weaknesses, it must be recognised that policies aimed at strengthening household endowments (e.g., adding years of schooling) not only tend to deliver aggregate results over long time frames but also may not yield large returns in isolation. A rather more pointed focus for policy is how to raise returns to unskilled labour, especially in rural areas. Indeed, a fundamental part of the reason why addressing labour market distortions is unlikely to be transformative is because *given* current technologies and economic structures, unskilled labour delivers low returns everywhere. An appropriate response is to raise returns in low productivity activities, especially agriculture where the majority of jobs are found, rather than aim for some kind of mass movement into (currently) higher productivity activities as household endowments strengthen.

This point gains substantive force in the context of rapid population growth and a small existing wage labour (formal employment) sector. Figure 17 takes the demographic projections from Figure 4, and estimates the absolute and relative size of the informal sector (principally agriculture) under alternative hypothetical rates of growth in the number of formal employment positions. The basic assumption for the figure is that the informal sector absorbs all residual new entrants to the labour market that are unable to find formal sector jobs. Thus if the size of the formal sector remained stagnant in absolute terms, then the informal sector is assumed to absorb all growth in the work force, such that it would grow according to the demographic projections in panel (b) of Figure 4. Historically, however, the growth rate of the formal sector has been positive but below 5%, and appears to have slowed to around 3% over the most recent period (2002/03 - 2008/09), which is consistent with a stagnant *relative* size of the formal sector in total employment. Figure 17 shows that if these historically observed growth rates continue, the informal sector will grow rapidly in absolute terms. In the 'worst case' 3% scenario, the informal sector doubles in size in about 25 years (2010-2035); at the (hardly pessimistic) 5% growth rate, the informal sector would be double its present size in 40 years (2010-2050) and would still be growing in 2050. The optimistic scenario of an 8% sustained growth rate in wage employment would not lead to an immediate decline in the absolute size of the informal sector;
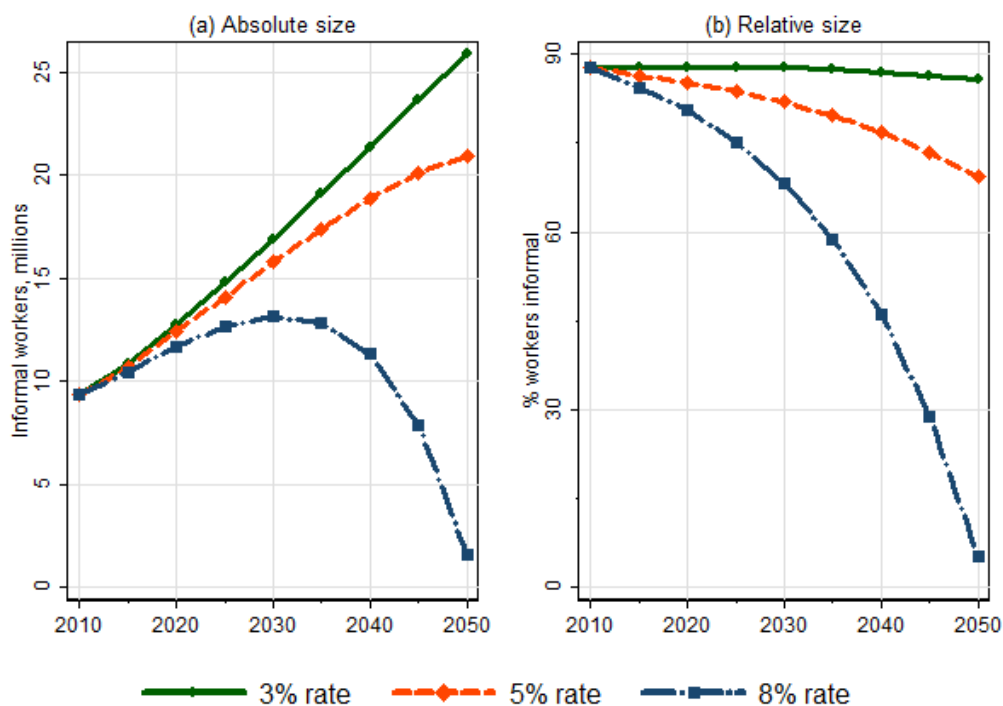
Notes: the figure shows relative and absolute projected size of the informal sector (non-wage employment) based on hypothetical growth rates of wage employment; underlying demographic projections are based on those of Figure 4.

Source: authors' calculations.

Figure 17: Demographic simulations of formal sector growth

however, over the simulated time frame it would be sufficient to largely formalise the productive economy.

The fundamental implication of these projections is that, over the next generation, the vast majority of all new jobs will be created in the informal sector. It is therefore unrealistic to presume that any feasible solution to the present set of jobs challenges lies uniquely in the modern sector, to the exclusion of rural agriculture. Addressing the jobs challenges now, which are pressing, thus must involve promoting good jobs within the informal sector. That being said, due to the presently low level of agricultural productivity, even moderate improvements in that sector are unlikely to have a transformative impact on the economy at large, such as significantly raising aggregate productivity levels. This suggests that while there is clear scope to achieve transformation in the agricultural sector, through (*inter alia*) the introduction of more productive technologies, agriculture should not be the sole focus of jobs-based policy initiatives.

Second, our analysis has shown that the informal sector is not homogeneous and cannot be fully understood as referring only to low productivity activities. Recall that the highest returns to

education, as well as certain public sector goods, are located in the household enterprise sector. Following the previous point, it is therefore reasonable to assume that the latter portion of the informal sector will also remain a key source of employment and poverty reduction. Thus, a policy challenge is how to nurture these enterprises such that they represent sources of entrepreneurial dynamism and innovation, thereby contributing more significantly to productivity growth. This policy challenge is important in Mozambique as the current urban policy stance, if any clear position can be identified, tends to view household enterprises as a problem and source of 'bad' competition with the formal sector. This tension has already led to overt conflict in some instances as government attempts to control (and contain) the household enterprise sector have been resisted. A policy rethink in this area is necessary.

Third, returns to human capital vary across occupations (jobs portfolios) – whilst they are lowest in agricultural activities, such returns remain low across most activities at sub-primary levels of education. This casts doubt on the specific economic effectiveness of certain 'standard' policy responses to rural disadvantages, such as expanding primary education, undertaken in the absence of complementary policies that raise returns to education for lower skilled workers. If anything, it reveals that the jobs challenge is complex and demands a nuanced response that takes due account of underlying labour market characteristics. A further implication is that returns to specific investments in other aspects of human capital and household assets, such as vocational skills and access to training in the use of appropriate technologies, may be critical. There are other reasons to promote education beyond its narrow economic impact. Also, an additional explanation for low returns in education is that primary schooling is of a low quality. The point is that careful evaluation of the cost-effectiveness of expansion of primary education vis-à-vis other potential interventions is essential.

Fourth, complex gender and age-related dimensions to jobs must be given due attention. We have seen that the propensity of young males to contribute (more) productively in the agricultural sector tends to be low. Additionally, it appears that women face greater difficulties in pursuing (higher quality) wage labour positions, likely because they principally bear the load of domestic responsibilities. This is relevant because recent expansion of the education system has been relatively gender-neutral, meaning that among young cohorts women are much less educationally disadvantaged than older generations. Changing expectations about what constitute good jobs thus is an additional challenge to which policy must be sensitive.

Finally, it should be recognised that labour market policies can have profound effects on the balance of incentives between the rural and urban sectors. Policies that might appear (superficially) supportive of the urban informal sector, particularly more vocal cohorts of urban youths, may have negative long term consequences, especially if they stimulate rural-urban

migration and reduce incentives for investment in smallholder agriculture.[32] This is particularly the case for broad-based (poorly targeted) palliative social policies such as transfers or subsidies that fail to raise informal-sector productivity.[33] However, effective urban and rural sector policies focused on the informal sector are inherently difficult to implement and are unlikely to yield immediate improvements in well-being. Where social cohesion is under stress, short term palliative responses may be favoured. The challenge, therefore, is that jobs policies must be pursued strategically and within a long term vision; the trade-off is that these may only yield pay-offs over long time horizons.

8.2 Jobs priorities

Moving from the reporting of research findings to the making of specific policy recommendations is rarely straightforward. It is all the more so here because (whether or not based on rigorous analysis), Mozambique faces a plethora of suggestions regarding the policy reforms expected to induce more and better growth. The present study does not seek to provide another list of such suggestions. Rather, we focus on where we believe the strategic priorities should lie, leaving detailed recommendations to one side.

At an overall level, the key objective must be to leverage forthcoming natural resource revenues to stimulate a pro-jobs structural transformation of the economy. A policy focus on creating good jobs is fundamental precisely because of the economic shift Mozambique is presently starting to experience toward capital intensive natural resource extraction. Both international and local experience shows that mega-projects generate few sustained employment posts and, in the absence of countervailing policy measures tend to appreciate the real exchange rate.[34] On the other hand, the opportunity of this economic shift is that, where managed appropriately (see below), it will loosen immediate budget constraints and place economic governance firmly in the hands of the government. Thus, there should be financial capital and policy space to make large, long-term, credible public investments and policy commitments.

Based on our empirical analysis, we recommend that three principal, complementary objectives be adopted as cornerstones of a pro-jobs policy agenda. These are to:

1. achieve a step-increase in agricultural productivity across the rural sector (comprising both small family farms and larger commercial operations);

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[32]Note that rural-urban migration has not yet proved to be a major policy challenge in Mozambique.

[33]This is not to dismiss the role of social safety nets or redistributive policies *per se*. The point is that these must be targeted and, ideally, combine a productive component such as training or access to new technology.

[34]This is shown by evidence of employment generated by foreign investment projects in Mozambique over the past 10 years. Rosenfeld (2012), for instance, estimates that massive investments in the coal sector will generate around 7,500 jobs for Mozambicans over the long-run.

2. foster the non-farm informal sector as a source of dynamism and entrepreneurship; and

3. aggressively support the growth of labour intensive secondary and tertiary industries with export potential

The following sub-sections justify the selection of these objectives and, without claiming to be comprehensive, suggest a number of areas where payoffs to specific policy interventions are likely to be high.

8.2.1 Getting agriculture going

The choice of agriculture as a policy priority follows directly from the findings and discussion of this study (e.g., Section 6), as well as a significant volume of prior scholarship on Mozambique (e.g., Heltberg and Tarp, 2002; Tarp et al., 2002; Arndt et al., 2012; Cunguara et al., 2011a). Support to agriculture can also be justified on the grounds that many productive investments in this sector have important public goods characteristics (e.g., indivisibility). In Mozambique, taking the perspective of 'good jobs' (Section 2), a main reason to focus on enhancing agricultural jobs is simply to raise living standards. Recall from Table 11 that 64% of all households engaged exclusively in household agricultural work are consumption poor and 87% are asset poor. Also, given the sheer weight of this sector in the volume of employment (plus the limited endowments of these households), only over the very long term is it conceivable to expect large numbers of existing (or future) households to accumulate sufficient human and physical assets to engage in higher-productivity non-farm work. Put bluntly, to make progress on poverty reduction, progress must be made in transforming agricultural jobs.

To do so, a starting point is to recognise past failings in policy coherence and policy implementation toward the sector. To date, it is difficult to argue that a clear and coherent set of policy priorities are in place. On the one hand, the government approved in May 2011 a strategic plan for the sector (*Plano Estratégico para o Desenvolvimento do Sector Agrário* 2011-2020, PEDSA). This made almost no reference to the role of large-scale (foreign) investments in a range of agricultural activities, including bio-fuels and cattle ranches that have been and continue to take place. Nonetheless, the latest priority idea (according to the Prime Minister's office) is 'ProSavana', an abbreviation for the Programme of Triangular Cooperation for Developing Agriculture in the Tropical Savannas of Mozambique. Although details are sketchy, the principal idea is to allocate large tracts of savanna land in the North of the country to Brazilian commercial farmers for the produce of soya and other commercial crops. These dual intentions to support smallholders and encourage foreign investment in agriculture are not necessarily contradictory if they are carefully planned and conflicts over land and the distribution of benefits are managed. Indeed, a

number of experiences in smallholder out-grower schemes in cash crops in Mozambique, such as tobacco, cotton and sugar, suggest that a combination of foreign investment (bringing know-how, provision of inputs, and access to markets) *can be* highly productive (Benfica et al., 2002; Benfica, 2007; Boughton et al., 2007). However, presently, this linkage is only encouraged, there is not a clear policy direction as regards the role of large scale land concessions (agri-businesses) and there also is no explicit set of incentives or regulatory regime which might pro-actively support and protect the development of modern contract grower schemes (see Jones and Gibbon, 2011, for a discussion of such schemes in the context of organic farming). Thus, clarifying and consistently supporting a coherent set of agricultural policies is fundamental. Additionally, a transparent regulatory structure for the sector which addresses the links between smaller and larger farmers is necessary.

Another critical area to address is how public funds are allocated. A number of reviews have identified that despite numerous public commitments, not only has the overall volume of public funds to agriculture fallen far short of what is required, but also the majority of such funds tend to be spent on central administration rather than on core functions such as extension, research, or productive investments (World Bank, 2011; Zavale et al., 2011). Equally, there is minimal coordination along agricultural value chains which means that bottlenecks frequently develop that undermine individual (isolated) investments. Thus, more coherent and transparent planning is required.

In addition to the above, we would suggest further measures to support agriculture. The first is to undertake large scale investments in rural infrastructure, including water storage, water management (e.g., irrigation), transport and electrification; these are fundamental to stimulate productive value chains (in new and old crops) and have been frequently identified as key constraints at the local level (see also Section 6). Second, recognising the present scarcity of access to extension services and modern inputs in the smallholder rural sector, the government must draw-in private sector energy and creativity, not least to allow a sustainable exit from support of the sector over the longer term. Targeted public-private partnerships (PPPs), (e.g., using performance-based subsidies), to deliver open pollinated high yielding seed varieties represent just one example of a range of possible schemes that are likely to bring large welfare gains at a relatively low cost. A key policy challenge is to design appropriate economic governance structures for such PPPs in agriculture, which reward genuine outcomes whilst recognising that these initiatives are inherently risky and some will fail. Consequently, an experimental mind-set is necessary to deal with the complexity of designing and implementing effective rural sector policies.[35] Third, we would recommend interventions on the demand-side

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[35]This is underlined by Kajisa and Payongayong (2011) who provide a detailed analysis of the potential for a Green Revolution in low-land rice farming in the Chokwe irrigation scheme in southern Mozambique. In particular they note the need to carefully nurture local land and factor markets, taking account of specific constraints such as labour shortages in peak (harvesting) season and costly access to inputs. The point is that challenges

to loosen cash constraints (poverty traps) and open-up opportunities for diversification into small-scale processing and non-farm activities.[36] To an extent, public programmes do exist that seek to achieve such outcomes (e.g., the *Fundo Distrital de Desenvolvimento*). However, this has been beset by implementation problems, has been prone to capture by local elites, and has frequently funded non-productive activities such as petty commerce and housing. In the minimum, a redesign of the latter scheme would be appropriate, taking account of lessons learnt.

8.2.2 Enhancing productive informality

A consistent theme of this study is the dynamic role that informal enterprises can play. Given the absence of widespread opportunities in the wage labour market (not least due to its limited size), non-farm informal enterprises both are and must continue to be a key source of 'good jobs'. As such they can make three vital contributions. They can: (i) provide a stepping stone from very low productivity agriculture to higher returns activities, thereby contributing to positive welfare-enhancing structural transformation in the sense of Fox and Pimhidzai (2011); (ii) support higher living standards in rural and urban locations; and (iii) provide a means to assuage social tensions to the extent that these activities are seen as credible, reliable and profitable.

What can be done to support the emergence of higher returns informal enterprises? In the case of Mozambique, a first step would be for the government to recognise the contribution of these enterprises, rather than treating them as a scourge. A corollary is for this sector to be included in the government's policy and institutional framework. To do so effectively, more specific research is required that can help identify the main constraints and opportunities, thus shedding light on the most suitable public policy interventions. Evidence both from this study and other countries (e.g., Fox and Kweka, 2011), however, indicates that ensuring affordable access to public infrastructure such as electricity, communications and transport is vital. Removing obstacles to access to land and improving access to credit for productive investments are also likely to yield high returns, particularly as higher-productivity household enterprises typically fall between very small-scale micro-finance (which often only fund petty commerce) and formal bank finance. Finally, targeted work experience and training programmes should be considered, especially for the urban youth. These can serve a dual purpose as a social safety net and build skills to contribute more productively in informal enterprises.

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differ hugely across the country and no grand plan is likely to be effective (for further discussion of technology transfer in Africa see Otsuka and Kijima, 2010).

[36]We recognize that interventions in these areas are complex. Thus, further research and rigorous evaluation of potential interventions is recommended.

8.2.3 Stimulating labour-intensive exports

Finally, although the informal sector will remain a key source of jobs over the medium term at least, formal jobs cannot be ignored. Given the advantages associated with formal sector employment, including enhanced stability and legal protection, these should be a key source of new jobs creation. Critically, in part due to the link with foreign investment and know-how, these jobs also are a main locus of higher value added activities and aggregate productivity expansion. They are therefore essential for long-term growth, especially in the secondary and tertiary sectors. At the same time, given the scale of the jobs challenge, it is desirable that incentives are created to promote labour- as opposed to capital-intensive enterprise growth. Also, for the dual reasons that domestic demand is limited by the size of the market and that export industries have enhanced incentives to reach the technological frontier, export-oriented activities must be given specific support.[37]

With respect to how these activities should be stimulated, a range of sensible suggestions can be found in Page (2012c). A key recommendation is to pursue spatial industrial policy, which refers to measures that stimulate the agglomeration of specific types of industries and tasks in particular geographical areas. This goes beyond a generic 'Doing Business' agenda, which tends to focus on the formal content of regulations, but rather places emphasis on putting in hard and soft infrastructure necessary for the private sector to compete at an international level. Thus, a leap forward in logistics capacity, transport links, customs administration and reliability of core public services such as electricity and water in specific areas are required. Importantly, it is unlikely that any kind of detailed national blueprint of what is necessary here is possible. Rather, devolved authority that is willing and able to learn *how* best to do spatial industrial policy is needed. In this light, a constructive focus of critical infrastructure investments should be around the needs of specific export value chains (from farm gate to ship) where Mozambique has comparative advantage.

Three other areas merit attention. The first are mechanisms to quality-certify and coordinate small and medium sized firms, such that they can effectively link to larger firms particularly but not exclusively in the natural resources sector. These are core public goods that no individual operator has any interest in supplying. Second, the current tax system remains overly complex and riddled with tax exemptions, particularly for capital investments, which tend to favour large (foreign) firms relative to smaller local operators (Byiers et al., 2010). The greater budget space that is likely to appear from the exploration of natural resources could be leveraged to level the tax playing field and strengthen the social compact between public authorities and small local firms.[38] Third, significant investments in technical skills are vital to ensure that firms face

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[37]See Feder (1983) (also Alvarez and López, 2008) for further reasons to explicitly support the export sector.

[38]See Rosenfeld (2012) for discussion of revenue implications of recent coal mining investments. A conservative

a sufficiently large pool of competent workers that are able to quickly add value in technical occupations.[39]

8.3 Risks and obstacles

Before concluding, it is worth reflecting on factors that may jeopardise the effective advancement of a jobs agenda. Most of these refer to the management of natural resources, which has been problematic in many lower income countries to date. A principal risk is that poor management of these resources, either during their development or exploration phases, leads to excess fiscal and macroeconomic volatility and a loss of aggregate competitiveness. The latter can occur through various channels, such as directly raising the real price of exports through exchange rate appreciation, as well as indirectly by raising the cost of labour and inputs due to competition from natural resource operators. As Mozambique has a weak and limited industrial base, and minimal macroeconomic management tools, there are good reasons to "go slow" with the development of natural resources in order not to overwhelm the economy as well as to foster skills and capacity over time. While some exchange rate appreciation is likely to be inevitable, any negative long-run effects on economic competitiveness can be more than offset by effective supply-side investments of the sort suggested in the previous section.

A related risk is that as natural resources flow into the public purse, public spending increases but does so in an inefficient and unsustainable way. Unproductive subsidies, inefficient investment, and a rising public wage bill are concrete examples of such effects which would likely further undermine incentives to generate good jobs throughout the economy. At the same time, if gains from natural resources are perceived to be unequally distributed, or simply not visible, social and political cohesion may be placed under stress. This is particularly the case because natural resource development is occurring far from the national capital in locations where support of the current ruling party (Frelimo) has been historically weaker. So, as noted previously, the risk is that palliative measures are employed so as to suppress conflict, but these have a negative effect on long term (good) jobs creation.

A fourth risk is that failure to raise the low level of smallholder agricultural productivity leads to a widening rural-urban gap and increased incentives to migrate into urban areas. This will likely place greater stress on the latter, including land, transport, housing, and social cohesion, and may quicken the kind of negative structural transformation seen in both Mozambique and other countries in Africa where labour is absorbed into an increasingly unproductive urban informal

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estimate is that these will generate around US$ 12 billion of government revenues from now to 2030. Large reserves of natural gas are also likely to even larger revenues over the longer term.

[39]The benefits of agglomeration economies and investments in training are not only relevant for formal sector jobs but also for those in the informal sector, directly and indirectly via spillovers.

sector. It would also make developing a framework that supports productivity increases in the household enterprise sector even more challenging.

What can be done to address these risks? Up front it must be recognised that there are no simple answers, and that in the ultimate instance effective management of natural resources comes down to a question of politics (governance). However, there are three simple instruments that can play a highly constructive role in fostering an environment that is conducive to higher quality management of natural resources. The first is monitoring and transparency, both at the level of the resource flows and of the economy more generally. Setting up an autonomous fund (or fiscal pot) to collect natural resource revenues and publishing detailed data about that fund (who pays in, how much goes out, and to where etc.) must be a priority. At the same time, there is need for better quality and more regular data to follow developments in the real economy, including of the labour market, exports, enterprises, farms and individual welfare. This leads to the second instrument, which is establishment of an independent national commission or panel to report on the country's state of macroeconomic competitiveness as well as on social cohesion and inequality. The idea is for this to be a credible, local exercise that can promote constructive debate about appropriate policy responses.

Third, there are large advantages to enacting a (detailed) set of fiscal rules into law which govern how natural resources revenues are to be spent. Such rules should not only set out clear rules on saving/spending from a natural resources fund, but also should assure that spending from the fund conforms to agreed principles such as investment in infrastructure, agriculture, specific regional allocations etc. Also, fiscal rules can stipulate that spending over a given size must be accompanied by (public) *ex ante* due diligence and *ex post* monitoring, thereby supporting a more transparent and effective public investment portfolio.

None of the above suggestions are guaranteed to be effective and, in themselves, they depend both on high–level political commitment as well as effective leadership. Thus, delivering on the jobs agenda in Mozambique will hinge on developing robust economic governance structures that are sensitive to macroeconomic competitiveness and supportive of positive structural transformation in the real economy.

9   Conclusions

Mozambique faces a number of acute jobs challenges. Impressive aggregate economic growth over the past twenty years has not been accompanied by sustained, rapid improvements in welfare at the household level. The majority of Mozambicans earn a living from smallholder agriculture, and the low productivity of these activities is a key reason why poverty (measured either by assets or by consumption) remains high. At the same time, population growth remains robust, which means that over the medium term more than 300,000 individuals will enter the labour market each year potentially increasing to 500,000 by 2025 (see Figure 4). Moreover, Mozambique's economic structure is shifting. Capital intensive natural resource extraction is becoming a dominant target of investment and export growth. As is well known, this entails large socio-economic risks and must be carefully managed to avoid a resource curse scenario, in particular, that of constricting growth in other sectors of the economy.

In light of these challenges, this paper aimed to take a close look at the Mozambican labour market and understand how jobs condition welfare outcomes. Employing survey micro-data as our information base, we started by setting out a set of 10 stylized facts about jobs in Mozambique, covering the period 1996 to 2009. These painted a gloomy picture, although one that is not uncommon to other low income African countries (e.g., see African Development Bank, 2012). There is no evidence of a positive process of structural transformation in the employment landscape; rather, underemployment is rife, education levels remain extremely low across the workforce and levels of labour productivity remain extremely divergent across sectors. In particular, we presented evidence of the state of agriculture, highlighting stagnant crop productivity (in terms of caloric production per person) and very limited access to modern inputs or technologies (e.g., less than 5% of farms use fertilizer or pesticide).

Reflecting on these stylized facts, the fundamental question is whether it is labour market imperfections that explain these outcomes, or whether these outcomes are symptomatic of deeper challenges that lie elsewhere. This motivates applying a jobs lens to the study of poverty. To do so, we elaborated a simple theoretical model. This showed that various of forms of labour market segmentation would be consistent with two empirical regularities: (i) the pooling of household labour into single activity portfolios (corner solutions); and (ii) differences in the marginal product of labour between these portfolios (labour market segments). Taking these empirical questions to the series of Mozambican household surveys, we find strong evidence of marked welfare differences between jobs portfolios and in particular that an exclusively agricultural portfolio is first-order dominated by all other portfolios (which contain a non-farm element; see Figure 15). More careful analysis, however, based both on the propensity to select into these portfolios and the determinants of consumption (correcting for labour market selection effects) reveal that a principal explanation for these labour market patterns is factor accumulation.

Households with low levels of human and physical capital are expected to receive low returns across all activities. This is not to say that the labour market operates efficiently, and we find some evidence of demand-side rationing. Nonetheless these distortions are simply not sufficient to fully account for the jobs challenges we observe.

These findings are confirmed by a set of policy scenario simulations (Section 7). They show that given current household endowments and the structure of returns to different activities, hypothetically allowing all households to select that labour portfolio which would yield the highest expected income would lead to roughly a 10 percentage point fall in the observed headcount poverty rate (from around 54% now). This is material but not transformational. Alternatively, targetted policies aimed at enhancing levels of rural education, returns to education and local infrastructure would generate poverty reductions of over 20% in rural areas (keeping labour market imperfections fixed).

Our analysis of the Mozambican labour market points to three jobs priorities. Arguably the most important is to address low levels of agricultural productivity. The rationale is simple – to make progress on poverty reduction, progress must be made in transforming agricultural jobs. This is also urgent. Given the sheer weight of this sector in the volume of employment (plus the limited endowments of these households), only over the very long term would it be conceivable to expect large numbers of existing (or future) households to accumulate sufficient assets to lift themselves into non-farm work and out of poverty.

However, jobs policy cannot limit itself only to the agricultural sector. Even substantial increases in agricultural productivity are unlikely to generate any form of stepwise increment in aggregate productivity. Also, there is a large informal urban sector which could represent a source of social tension if the productivity of these enterprises remains low, and access to urban employment remains limited, especially for youth cohorts. Thus, two other priorities need to be addressed simultaneously. The first is to foster the non-farm informal sector as a source of dynamism and entrepreneurship. Indeed, our analysis has shown that many non-farm jobs can be highly profitable and generate returns in excess of those available in formal wage employment. Good jobs are not just formal sector jobs. However, the government currently tends to see these firms as a source of unhealthy competition to the formal sector and thus they face serious difficulties of expansion and access to finance. A change of attitude and policy stance is required. Second, we recommend that government aggressively supports the growth of labour intensive secondary and tertiary industries with export. These are essential to aggregate productivity expansion and long-term growth. Spatial industrial policy and leveraging of natural resource revenues to substantially improve infrastructure and logistics services along key value chains need to be given attention. Thus, the jobs challenge in Mozambique is acute; but there are definite opportunities to pursue a developmental trajectory that addresses these challenges head on.

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