

Labor Mobility, Economic Shocks, and Jobless Growth

Evidence from Panel Data in Morocco

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Middle East and North Africa Region
Poverty Reduction and Economic Management Department
March 2014



Abstract

During the past 20 years, Morocco has implemented a wide range of macroeconomic, social, and labor market reforms that have delivered in terms of growth of gross domestic product and household welfare. Yet, these positive developments are not reflected by the main labor market indicators, a phenomenon observed elsewhere in developed and developing economies alike and labeled as “jobless growth.” For the first time for Morocco, this paper uses quarterly panel data to investigate the question of labor mobility in an effort to determine whether

people have moved to better sectors and jobs. The results point to significant labor mobility between labor statuses with quite distinct features across population groups. All groups experience some form of labor market mobility every quarter and women are as mobile as men. However, the transitions that women experience are very different from the transitions than men experience and women’s performance is worse than men’s performance in almost all aspects of labor mobility.

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Labor Mobility, Economic Shocks, and Jobless Growth

Evidence from Panel Data in Morocco¹

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JEL: F66, J01, J08, J16, J21, J42

Keywords: Labor market, unemployment, employment, labor force participation

Sector board: Poverty Reduction (POV)

¹ The paper has been prepared by a joint team from the High Commission for the Plan of Morocco and the World Bank. We are grateful for detailed comments to Tara Vishwanath, David Robalino, Diego Angel-Urdinola and participants to seminars held in Rabat and Washington where the paper was presented.

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1. Introduction

Starting from the late 1980s, Morocco has embarked on an unprecedented set of economic and social reforms that deeply changed the institutional and economic framework of the country. These comprehensive sets of reforms have contributed to deliver in terms of GDP growth and household welfare. The economy enjoyed sustained growth estimated at around 5% on average per year between 2000 and 2010 and there is evidence that GDP growth trickled down to households reducing poverty from 15.3% in 2001 to 8.9% in 2007 (Doudiuch et al, 2013). These improvements also occurred in a global context characterized by two major financial crises in 2001 and 2007 and rising food and commodities prices.

Yet, these positive economic developments seem inconsistent with the changes depicted by the Employment Rate (ER) and the Labor Force Participation Rate (LFPR), which have been both rather stable despite large differences across space and gender. The phenomenon of GDP growth combined with employment stagnation has been observed elsewhere in developing and developed economies alike and labelled as “jobless growth” (Bhalotra, 1998, Verme, 2006, Wolnicki, 2006). Explanations of this phenomenon vary from pure demographic factors related to the growing size of the working age population to purely economic factors such as sharp increases in productivity due to technological changes. Irrespective of these determinants, it is nevertheless odd that an economy that grows at 5% per year does not exhibit a ‘buoyant’ labor market with labor reallocation from less productive to more productive sectors and movements from poor jobs to better jobs.

This paper asks the question of whether, behind the main labor market aggregates, jobless growth has been accompanied by patterns of labor mobility that would point to positive changes in the labor market. Have people been mobile? Have they improved labor market status? Have they moved to better jobs? This paper delves into labor mobility in Morocco to unpack labor market dynamics in an effort to answer these questions. For the first time in Morocco, the paper uses the panel component of the Moroccan Labor Force Survey (MLFS), a nationally and regionally representative quarterly survey of 15,000 households accounting for approximately 65,000 individuals. Markov transition matrixes are used as the sole instrument of analysis and applied to 16 quarter to quarter periods of one year each covering the period 2007–2011. The period selected is also particularly interesting as it follows the 2007 global financial and economic crisis while it captures an exceptional agricultural year in 2009, two major shocks to the economy that are expected to generate increased labor movements.

Results point to high labor mobility across labor categories and a clearly segmented labor market along urban and rural areas and gender lines. About a quarter of the population experienced some form of labor market mobility during each of the years considered and mobility is high for both men and women. For men, transitions are across all statuses and jobs and transitions from worse to better statuses and jobs prevail. For women, transitions are mostly from inactivity to informality and unpaid work and there are few movements towards better statuses and jobs. It is also clear that the single group that suffers the most in the labor market is women living in rural areas. The paper points to a gender asymmetry in how the labor market reacts to economic shocks and calls for policy makers to pay more attention to this fact.

The paper is organized as follows. In the next section we outline the policy context and most important reforms undertaken by the Government of Morocco during the past twenty years as well as the economic shocks and outcomes. Section 3 introduces data and methods used for the analysis and section 4 illustrates results on labor mobility covering labor mobility across multiple labor market dimensions. This is done by looking at a wide range of labor statuses including employment, unemployment and inactivity, economic

sectors, public and private sectors, formal and informal employment, pay status and work time status. The analysis is carried out separately for the four groups defined by gender and urban rural location. Section 5 attempts to answer the main questions addressed by the paper and discusses the policy implications.

2. Economic reforms and outcomes

Starting from the late 1980s, Morocco has embarked on an unprecedented set of economic and social reforms that deeply changed the institutional and economic framework of the country. Macroeconomic policies included regulatory and institutional improvements to attract foreign investments, price liberalizations, privatization, better competition laws, a better framework for SME development and a progressive opening of the economy to global trade. Some of the reforms that have been recognized to promote growth included: elaboration and implementation of a charter of investment which provides many incentives and advantages for investors; Establishment of a National Agency for Investment Promotion; Creation of Regional Centers for Investments; Modernization of the legal environment of business with the adoption of the Commercial Code; Reform of the companies law and the competition and freedom of pricing law; Adoption of legislation on protection of intellectual and industrial property in order to encourage creativity; Establishment of guarantee funds for financing investment and upgrading of SMEs; Construction of new industrial areas for complex businesses; Simplification of the tax system and reduction of corporate and personal income taxes; Adoption of a new budgetary approach based on performance; Reform of the banking law in order to facilitate access to credits; Modernization of the Casablanca Stock Exchange and implementation of the privatization program.

In an effort to increase the integration of Morocco into the global economy, the country also joined the WTO and signed bilateral trade agreements with the US, EU and several Mediterranean countries. Stabilization policies aimed at controlling inflation, reducing the debt/GDP ratio and reaching a competitive real exchange rate were also central to the government agenda and the country is credited for largely achieving these objectives. A large program of infrastructure development accompanied these reforms with the aim of closing the gap between urban and rural areas and developing the growth potential of more remote areas.

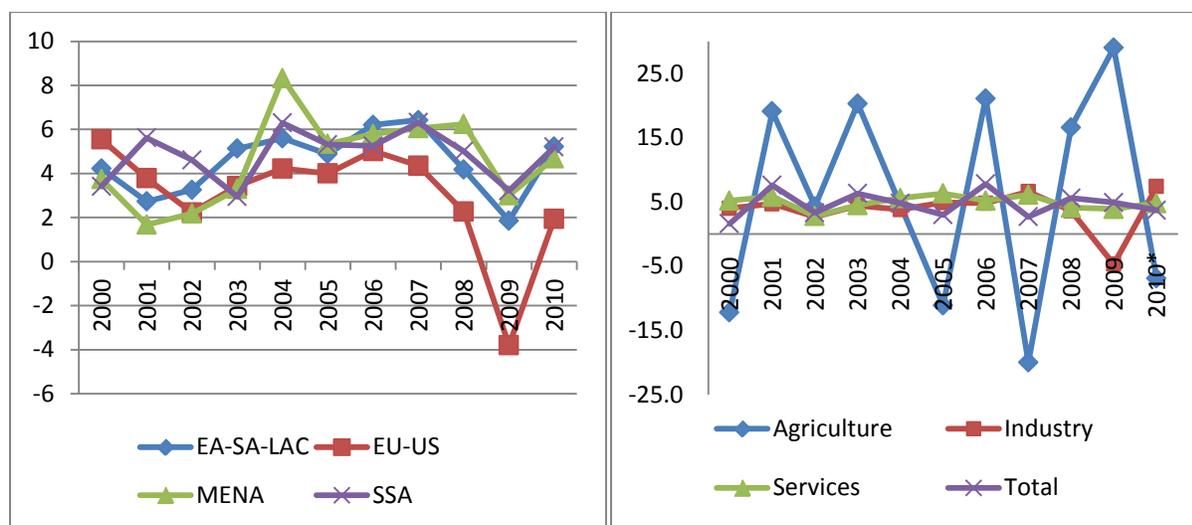
On the social and microeconomic side, programs included the 2000-2004 development plan, the fund for the fight against droughts and desertification, the fight against illiteracy, the work of the foundation Mohamed V for solidarity, the work of the agency for social development and the national agency for employment and skills promotion, several initiatives for microcredits promotion and the national charts for education and health. In addition, the launch of the National Initiative for Human Development (NIHD) in 2005 – an ambitious national plan to develop the poorest areas of the country – marked an important step forward in addressing the wider spectrum of deprivation. The government of Morocco has also been reforming Labor Market Policies (LMPs). Perhaps the most significant change introduced was the adoption of a new labor code and new rules for the tripartite agreements. These institutional reforms have been accompanied by the launching of various programs including the Idmaj (insertion contracts), Taehil (training and re-training) and the Moukawalati (promotion of self-employment and small enterprises) programs. In essence, Morocco has been one of the most vibrant countries in the MENA region in terms of policy reforms and today the institutional setting of the country is substantially different from the one that the country had ten or twenty years ago.

Have these policies translated into growth and prosperity for the population at large? If we want to understand the performance of the Moroccan economy and labor market in recent years, we need to

understand first the global and domestic economic context. As shown in Figure 1 (left panel), at the outset of the decade, world growth rates were around 5% on average with relatively small differences between developed and emerging economies. The 2001 financial crisis determined the first visible decline in world output affecting all groups of countries and reducing average growth rates by about 2-3 percentage points. We then see an exceptional period between 2001 and 2007 where all groups of countries enjoy increasing growth rates. During this period, it is also evident a diverging trend between developed and emerging economies with the emerging economies clearly outpacing developed economies. The Euro zone, which includes some of the major trade partners of Morocco, was the worst performer among the group of countries considered in terms of average growth during and after the crises.

During the same period, Morocco experienced significant annual changes in GDP growth but remained in line with world growth overall, with a growth rate hovering around 4-5% a year (Figure 1, right panel). The significant annual fluctuations of the Moroccan economy are explained by the performance of the agricultural sector, which affects the trend in GDP growth despite accounting for only about 15% of GDP. In particular, Morocco has been able to counter balance the effects of the 2001 and 2007-2009 world crises thanks to exceptional agricultural years that happened in conjunction or following the two global crises. As shown in Figure 1, the performance of the agricultural sector in 2001, 2008 and 2009 was very good.

Figure 1 - World and Morocco GDP growth 2000-2010



Source: World Bank Open Data and Morocco National Accounts, HCP (2000-2010). EA=East Asia ; SA-South-Asia ; LAC=Latin America and Caribbean ; EU=EUrope and Central Asia ; US=United States ; MENA=Middle East and North Africa ; SSA=Sub-Saharan Africa

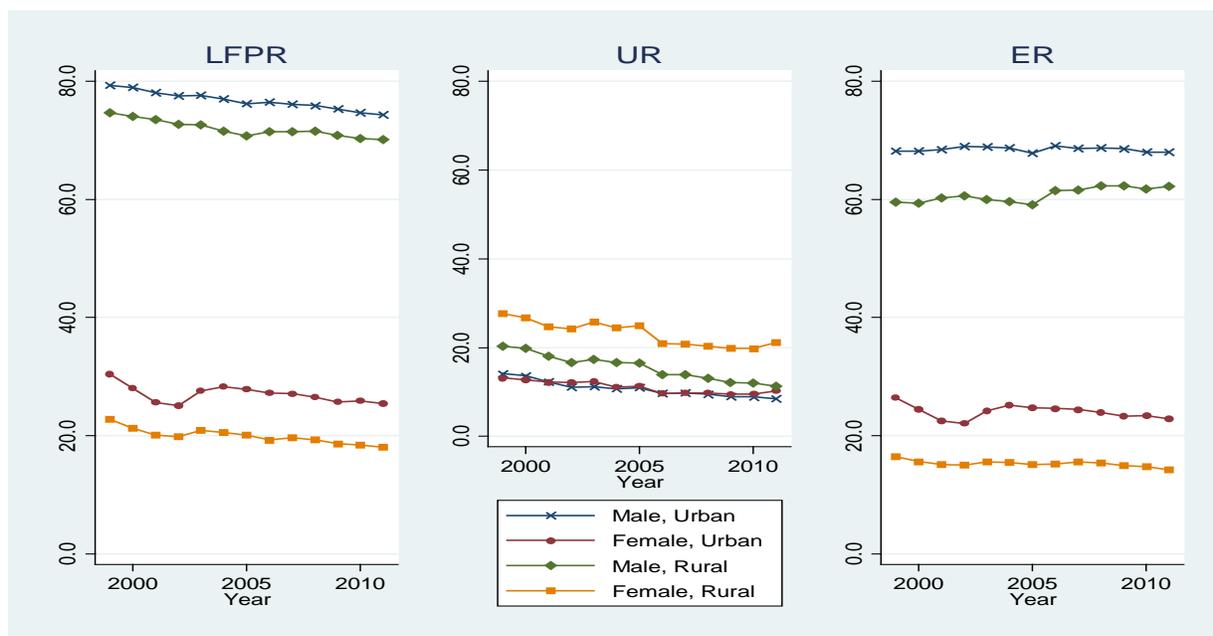
Macro and micro indicators concord in determining that GDP growth has trickled down to households. Household final consumption growth has closely followed the evolution of GDP growth (HCP 2000-2010). This macro picture is also supported by micro data. The HCP (2010) estimates that household consumption in real terms has increased at an average rate of 2.8 percent a year between 1999 and 2007 as compared to -1.8 percent of the previous decade. And the poverty rate has declined at an annual rate of -7.3 percent as compared to a growth rate of +2.8 percent of the previous decade. Comparing the 2001 and 2007 household consumption surveys shows that the poverty rate has declined from 15.3% to 8.9% and this has resulted in an effective reduction in the number of the poor, from 3.4 m. in 2001 to 2.7 m. in 2007. These positive

developments have been pro-poor, pro-rural areas and also multidimensional determining an inversion of trend vis-à-vis the previous decade.

Have these positive economic outcomes been accompanied by visible changes in the structure and performance of the labor market? One of the problems that have been affecting developed and developing economies alike during the past decade is the question of jobless growth. Most emerging economies grow at significant annual rates and many of these economies also deliver in terms of population welfare but this seems to occur with no real growth in employment (Bhalotra, 1998, Verme, 2006, Wolnicki, 2006).

Morocco has experienced a similar path of jobless growth. Key indicators of the labor market are on a downward trend since 2000. The Labor Force Participation Rate (LFPR) at the national level fell from 54.5% in the late 1990s to 49.2% in 2011, a decrease of 5 percentage points over the period. The Employment Rate (ER) follows the same trend, especially in rural areas. At the national level, it declined from 46.9% in 1999 to 44.8% in 2011, representing a decline of almost two percentage points over a period of more than ten years. A more positive picture is conveyed by the Unemployment Rate (UR), which declined persistently throughout the decade from 13.8% in 1999 to 8.9% in 2011. However, the unemployment rate remains a poor indicator of the labor market performance in a country like Morocco characterized by a very large informal sector. And, given the decline in the LFPR, the decline in the unemployment rate may be explained by a growth of the discouraged unemployed.

Figure 2 – Main Labor Market Indicators 2000-2011



Source: Authors' estimations from LFSs 1999-2011.

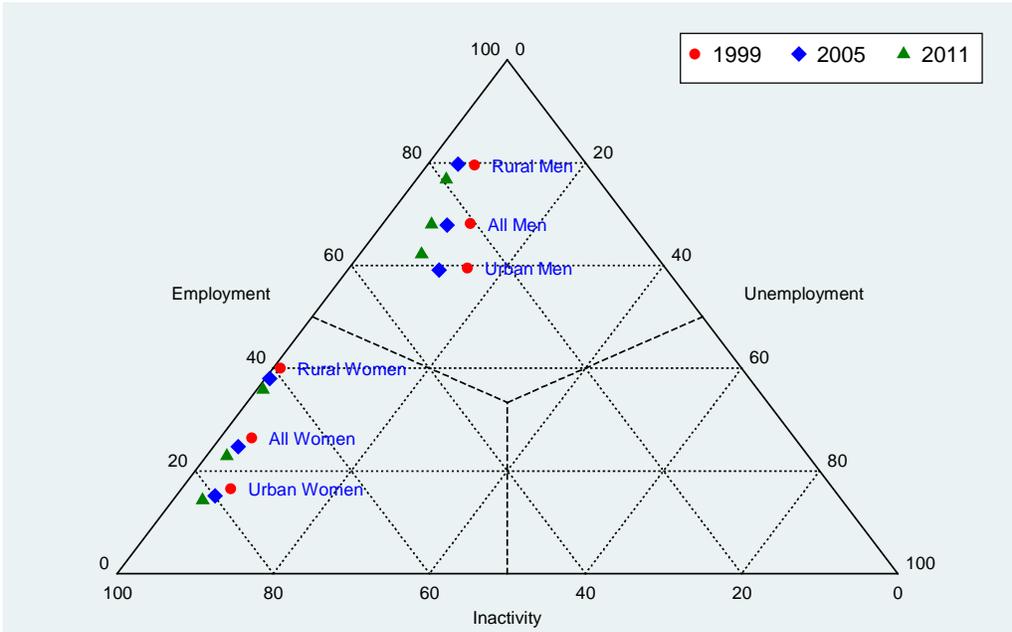
To better appreciate the relative changes of employment (E), unemployment (U) and inactivity (I), we plotted in the figure below each labor market status on one side of the triangle and normalize the sum of the three labor market statuses (WAP) to 100. Each point in the triangle represents a particular E-U-I structure in one particular year. We plotted these points for three years (1999, 2005 and 2011) and for different population groups constructed along gender and location lines.

The analysis of the figure below shows three clear characteristics of the Moroccan labor market. The first characteristic is that the level of inactivity has increased relatively to employment and unemployment and for all groups between 1999 and 2011. This is visible by looking at the dots that move over time towards West and South-West of the figure. The second is that the labor market is clearly segmented along gender and location lines. Urban and rural men and women occupy a very distinct position on the graph with rural men being on the North-West extreme and urban women being on the South-West extreme. And the third characteristic is that the four groups maintain this distinct position throughout the decade considered with small movements and no overlaps with other groups.

More in detail, for men, the dominant position is employment. More than 60% of men aged 15 and above are employed in both urban and rural areas. In urban areas, the share of employment is stable and fluctuates around 60%, the unemployment share decreases while that of inactivity increases. In rural areas, the share of employment is higher (around 80%) and decreased slightly over the period, the unemployment share is stable while that of inactivity increased. This suggests that in this area, the decline in the LFPR and the employment rate for men is due to job losses.

For women, the situation is entirely different with inactivity being the most relevant status. At least 60% of working age women are inactive regardless of the place of residence (80% urban and 60% rural). Moreover, this situation is exacerbated by the changing structure over the whole period. Indeed, whatever the place of residence, the share of inactivity is increasing, mostly to the detriment of employment, the share of unemployment being stable. This shows that there are strong barriers to the participation of women in economic activity, especially in urban areas, and that women have not been able to join the labor force in greater shares.

Figure 3 – Structure of the working age population (1999-2011)



Source: Authors' estimations from LFSs 1999-2011.

Beyond these mostly negative labor market trends, has the labor market been buoyant and can we observe positive developments that could point to a structural transformation of the economy setting the conditions for further growth? The period observed could be a period of economic restructuring with declines in employment and participation explained by increases in productivity and competitiveness. A simple decomposition of GDP growth into productivity, employment and population growth shows indeed that productivity growth is the single factor that explains better GDP growth followed by the growth in the working age population while changes in employment had a negative effect on growth (Table 1). This decomposition helps to explain the jobless growth story. Morocco has moved in the right direction in terms of growth policies and has become a more modern economy but these positive developments have not been able to be sufficiently strong to outweigh the growing working age population or sufficiently inclusive to expand employment.

Table 1 – GDP Growth decomposition into productivity, employment and working age population (2006-2010)

	Percent of total change in per capita value added growth
Total Growth in per capita GDP (value added)	100
Growth linked to output per worker	97.17
Growth linked to changes employment rate	-23.53
Growth linked to changes in the share of population of working Age	26.36

Source: Authors' calculations based on the Job Generation and Growth (JoGG) decomposition tool (World Bank) and HCP (2000-2010).

The question we want to address in the rest of the paper is whether this particular development pattern has resulted effectively in better occupations and better jobs and whether these changes have been homogeneous across population groups or rather unequal with winners and losers resulting, as a consequence, in a more segmented labor market.

3. Data, tools and framework

The paper uses the panel component of the Moroccan Labor Force Survey (MLFS). The MLFS is a household survey covering all residents on the national territory. The sample size is 60,000 households, 40,000 urban and 20,000 rural, and contains information on all household members, approximately 270,000 individuals every year. This sample is divided into four equal independent sub-samples of 15,000 households each interviewed quarterly. Each sub-sample is representative at the regional level and by urban and rural areas. Sampling is a random three-stage process.

Starting from 2006, half the households are re-interviewed every quarter, which makes the survey a quarterly panel survey with one time lag of one year. And since 2007, interviews are conducted all year long by means

of a computerized system where data input occurs with Personal Digital Assistance (PDA) devices and data input verification is carried out both automatically with a special software and with controllers in real time. Given the introduction of the new panel component in 2006 and the introduction of the PDA assisted survey in 2007, this paper will focus on the period 2007-2011, which accounts for a total of 20 points in time and 16 panel groups of one year in length.

Labor mobility is measured using panel data and by means of Markov chain or transition probabilities matrixes. The probability of transitioning from state i to state j is defined as $P_{i,j} = \Pr(j|i)$ and the percentage sum of probabilities is $\sum_i P_{i,j} = 100$. Our data allow for only one transition step over a period of one year and for each quarter of the year. Let i and j be two mutually exclusive sectors with $i \neq j$, N the total finite sample of individuals, $n_{i,j}$ the number of sample individuals moving from sector i to sector j , W the total population weight and $w_{i,j}$ the weight which accounts for both the population weight (number of individuals in the population) and sample weight (inverse of the probability of being selected in the sample) for the group moving from sector i to sector j . With $nw_{i,j}$ representing the population moving from sector i to sector j , then the transition probability matrix for the population can be described as in the table below.

Table 2 – Transitions formulae

	Sector i	Sector j	Total
Sector i	$nw_{i,i}/NW$	$nw_{i,j}/NW$	$(nw_{i,i} + nw_{i,j})/NW$
Sector j	$nw_{j,i}/NW$	$nw_{j,j}/NW$	$(nw_{j,i} + nw_{j,j})/NW$
Total	$(nw_{i,i} + nw_{j,i})/NW$	$(nw_{i,j} + nw_{j,j})/NW$	NW

We can also define $nw_{i,j}$ and $nw_{j,i}$ as the “movers” and $nw_{i,i}$ and $nw_{j,j}$ as the “stayers”. Our focus throughout the paper is on the movers and to simplify exposition we will mostly report statistics on the movers with the total of movers equal to 100.⁶ By design, transition matrixes require the observation of individuals in both the initial and final period. This forcibly excludes new labor market entrants who are present in the sample in the final period but not in the initial period. We will see that this is an important consideration when we wish to relate labor mobility with labor market statistics such as the participation rate. The technical annex discusses the problems related to the estimation of the transition matrixes and the solutions applied to the Moroccan data.

We consider labor market mobility across labor market statuses, economic sectors or contractual arrangements (sectors for short) arranged as multinomial variables and including employed/unemployed/inactive, agriculture/industry-services sectors, private/public sectors, paid/unpaid work, full-time/part-time work and formal/ informal employment. It is possible to provide in this way a tentative normative classification of sectors from the standpoint of the social planner so that we can classify sectors in “better” and “worse” and identify *upward* and *downward* mobility. Such normative classification does

⁶ In the results section, transition probabilities matrixes are estimated in STATA using the `xttrans2` command.

not reflect individual taste for labor market status or for contractual arrangements but simply the interest of the social planner for maximizing production and productivity.

Figure 4 below shows our normative classifications and how we capture downward and upward mobility. It can be argued that, from the standpoint of the social planner who wants to maximize production and productivity, employment is better than unemployment and inactivity while private employment is better than public employment. We can also argue that services and industry are better than agriculture in that these sectors are generally characterized by higher value added and productivity. This is not always the case of course. But it is known that, during the historical and structural transformation of societies, agriculture is the first sector to shrink during periods of industrialization while the service sector is the last sector to expand as societies move from agriculture to industry and into the knowledge era. Such classification may help to capture advancements in the structural transformation of a society. Based on the same principles, we also categorize paid and unpaid employment, full-time and part-time employment and formal and informal sectors in this order.

Figure 4 – Labor Market Mobility Across Sectors



It is known that labor mobility occurs mostly within sectors rather than across sectors and that net cross-sector mobility tends to be close to zero as bilateral flows tend to cancel each other out (Jovanovic and Moffitt, 1990). The framework presented above will allow us to clearly see whether cross-sector mobility has occurred, to what extent and in which direction.

4. Labor mobility

We follow the same structure presented in Figure 4 and look at transitions estimated as percentages of total transitions, focusing therefore on the “movers” rather than the “stayers”. However, all tables will also provide the share of “movers” over the total population in each group considered while Table A1 in the annex provides the population shares of each group considered. The analysis is carried out separately by gender and location so that we can compare outcomes for four groups: urban men, urban women, rural men and rural women. Such categorization is a natural choice that derives from the description of the Moroccan economy and labor market that we provided in section 2 where we remarked the extraordinary segmentation of the Moroccan labor market into these four groups.

Employed, Unemployed, Inactive. Taking the sum of the bilateral flows between the active and inactive population equal to 100, we can calculate the percentage of people who moved from inactivity to activity for the period 2007–2011 and by year. Table 3 shows the results. Given that the flows from inactivity to activity are all above 50%, it is clear that participation to the labor market has increased for all groups (men and women in urban and rural areas) and for all years (2007–2011). This is a positive result overall that concerns the panel sample, the population that was in working age at the beginning and at the end of each period. Therefore, the negative LFPR trend observed in Figure 2 for the period 2007–2011 is explained by the new labor market entrants, those turning 15 who are out of school or those older than 15 who leave school.

Transitions into activity are higher for men as compared to women and this is true in urban and rural areas and for all years considered. With one exception, transitions into activity are higher in rural than in urban areas for both men and women. There is a difference between urban and rural areas in terms of response to the 2007–2008 global crisis as rural areas have increased transitions into activity in 2008-2009 as compared to urban areas where transitions have declined. As already mentioned, this can be explained by the exceptional agricultural production in 2009.

Table 3 – Transitions from inactivity to activity (% of total transitions)

	Urban		Rural	
	Men	Women	Men	Women
2007-2008	58.2	52.0	61.9	51.0
2008-2009	54.3	50.9	62.1	52.4
2009-2010	55.0	52.2	59.5	55.4
2010-2011	56.0	51.7	57.2	54.3

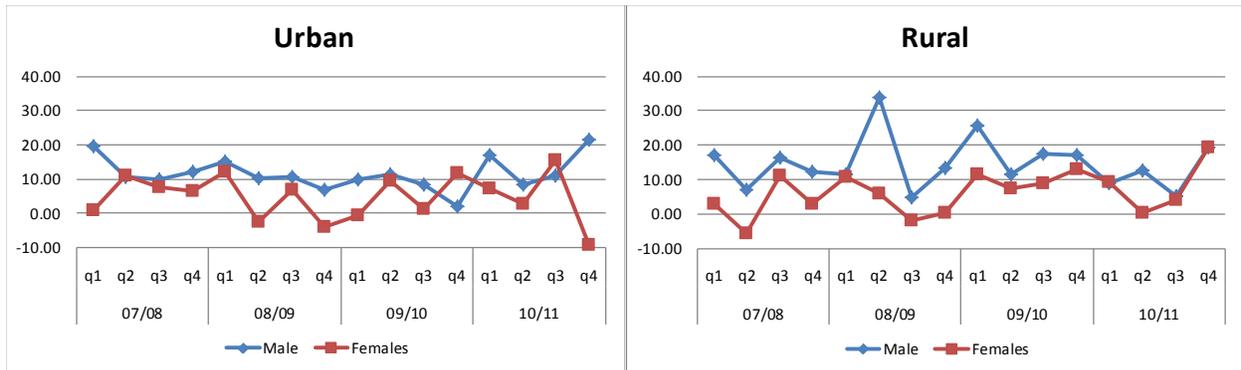
Source: Authors' estimations from LFSs 2007-2011.

If we look at the quarter to quarter transitions, we find different trends for urban and rural areas and also different trends for men and women. Figure 5 shows the net upward transitions for the four groups.⁷ In Urban areas, men's upward transitions are always positive indicating constant increases in labor force participation but for women there are several negative spells so that net participation varies depending on the quarter considered. Overall, the gender gap in urban areas is small but men outperform women throughout the period with the exception of a couple of quarters.

In rural areas, both genders manage to increase participation throughout the period with the exception of two quarters for women. The gender gap seems a bit larger in rural areas as compared to urban areas with men clearly outperforming women throughout the period. Also, the female and male trends in rural areas seem to be pro-cyclical, a phenomenon less clear in urban areas. Therefore, in rural areas, seasonality and shocks (good or bad agricultural seasons) drive the quarterly performance while in urban areas these factors are less important in explaining the gender gap. One possible explanation of this phenomenon is rural-urban migration which cannot be captured by the transition matrixes. A good agricultural season may attract more workers to agricultural areas (males and females) but has also a positive impact on urban areas via commercial and production activities.

⁷ The net upward transitions are the difference between the sum of upward movements and the sum of downward movements across the statuses considered.

Figure 5 – Net Quarterly Upward Transitions between Employment, Unemployment and Inactivity (% of total transitions)

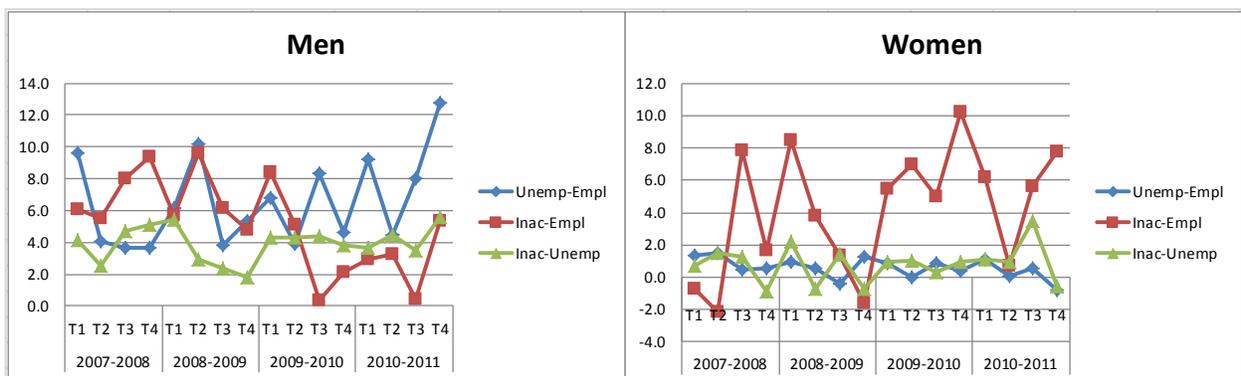


Source: Authors’ estimations from LFSs 2007-2011.

If we bring unemployment into the picture, we can appreciate how changes in unemployment are determined. Figure 6 shows the net bilateral transitions between employed, unemployed and inactive. For example, a 10% net flow between unemployment and employment indicates that the flow from unemployment to employment has been larger than the reverse flow from employment to unemployment. Thus, positive values indicate positive developments and negative values indicate negative developments.

We can see that the net flows are all positive for men while for women there are negative quarterly spells for all flows. In particular, for men the best performance is shown by people moving from unemployment into employment while for women the best performance is from inactivity to employment over the period. Therefore, when the economy performs relatively well, women are attracted into employment directly from inactivity while they are pushed back into inactivity when the economy performs less well. In essence, women, especially rural women, do not pass through unemployment when joining or leaving employment and downward mobility dominates for women as opposed to men where upward mobility dominates.

Figure 6 – Net Quarterly Flows between Employment, Unemployment and Inactivity (% of total transitions)



Source: Authors’ estimations from LFSs 2007-2011.

Economic sectors. Following the scheme in Figure 4, we look now at mobility from agriculture to non-agriculture (industry and services) also considering unemployment and inactivity so as to have a complete set of transition flows. Table 4 presents the results for the four groups urban men, urban female, rural men and rural female. The largest flows are highlighted in grey by group.

Overall mobility has decreased for all groups between 2007 and 2011 (last row, Table 4). Men are more mobile than women in urban areas and the opposite is true for rural areas. The latter is mainly explained by the transitions between inactivity and agricultural activities in both directions. The top flows (highlighted in grey) are consistent across years for each group and they are all upwards, although they are very different across groups. In urban areas, the top flow for males is from unemployment to non-agricultural activities (industry and services) while it is from inactivity to non-agricultural activities for women. In rural areas, the top flow for men is from agricultural to non-agricultural activities while it is from inactivity to agricultural activity for women. Upwards flows account for over 50% of flows for all four groups but the rates are higher for men as compared to women for all four groups considered. All groups have done well but less well over time and men have done better than women.

Table 4 – Transition flows between agriculture, non-agriculture and inactivity (% of total transitions)

	Urban								Rural							
	Male				Female				Male				Female			
	07/08	08/09	09/10	10/11	07/08	08/09	09/10	10/11	07/08	08/09	09/10	10/11	07/08	08/09	09/10	10/11
Agr-->Nagr	4	4	4	3	1	1	0	1	22	20	21	22	2	1	1	1
Agr-->In.	2	1	2	1	3	4	3	4	13	11	13	12	40	41	38	40
Agr-->Un	1	1	1	1	0	0	0	0	5	4	4	5	0	0	0	0
Nagr-->Agr	3	4	4	3	1	0	0	1	21	20	17	19	2	2	2	1
Nagr-->In.	14	16	15	16	25	26	25	25	2	4	3	4	4	4	4	3
Nagr-->Un	18	17	18	17	5	6	7	6	4	5	4	4	0	0	0	0
In.-->Agr	1	1	1	1	3	3	3	3	12	14	14	11	43	45	47	46
In.-->Nagr	16	16	15	16	27	27	28	28	5	5	5	5	5	3	5	4
In.-->Un	10	9	11	9	15	14	14	14	3	3	4	3	1	1	2	2
Un-->Agr	1	1	1	1	0	0	0	0	6	5	7	6	0	0	0	1
Un-->Nagr	24	24	22	26	7	7	8	6	5	6	8	7	0	0	1	0
Un-->In.	6	6	7	5	13	13	12	12	1	2	1	1	1	1	1	1
Total	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100
Upward	56	55	54	57	53	52	53	52	54	55	57	54	52	51	55	54
Total (% of pop.)	17	16	16	15	12	11	11	11	22	20	19	19	26	23	22	22

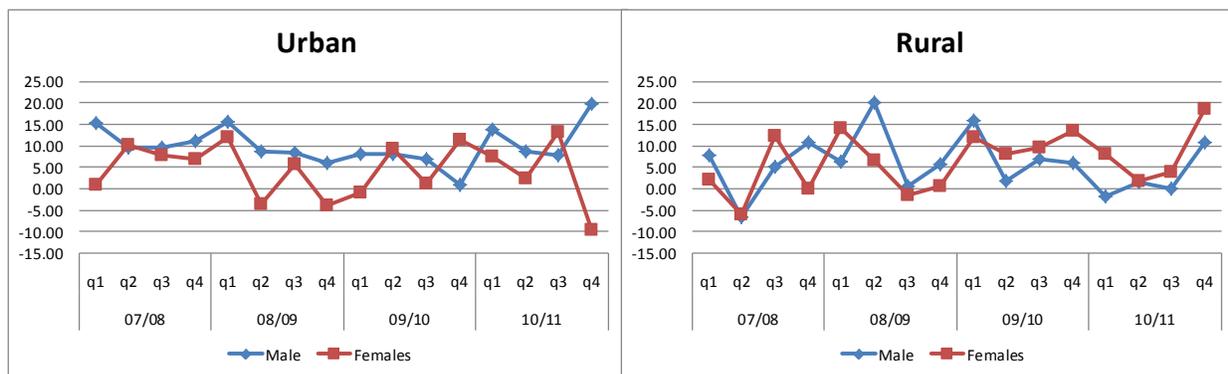
Source: Authors' estimations from LFSs 2007-2011. Agr.=Agriculture; Nagr.=Non agriculture; In=Inactive; Un.=Unemployed.

It is remarkable the little role played by industry in overall mobility. Flows into industry from all other sectors account for only 10% of total transitions for men and about 8% for women. The trends of these shares over the period 2007–2011 also seem to be declining, by about 1% for men and by 0.5% for women. Therefore, the core economic sector of the economy which includes manufacturing has not been able to pull significant amount of workers from other sectors or inactivity and unemployment.

Net quarterly upward transitions trends show that in urban areas males are always on the positive side with upward transitions dominating downward transitions in all quarters and all years. This is in contrast to female

transitions that show negative values in four quarters. In rural areas the gender gap almost disappears with the quarterly trends being very similar. Both genders experience three negative spells and there is clearly more variations across quarters as compared to urban areas. In the latest 2009–2011 period females seem to outperform males. This is the only episode in the whole paper where females seem to do better than men.

Figure 7 – Net Quarterly Upward Transitions between Economic Sectors (% of total transitions)



Source: Authors’ estimations from LFSs 2007-2011.

Public and private sectors. If we consider the private and public sectors, the greatest transitions occur from unemployment and inactivity to the private sector. It is also evident that the private sector recruits mostly from inactivity. The second largest transition flow is from the private sector to inactivity indicating that most of the transitions under this categorization are between the private sector and inactivity with the two flows almost matching at times. These trends are very similar for all four groups considered except urban males for whom the largest transition flow is from unemployment to inactivity.

The public-private transitions are very few and they are roughly equivalent in both directions. There are almost no transitions from the public sector to unemployment indicating that the public sector rarely sheds labor. There are also few transitions from the public sector to inactivity (in working age) and these are likely to be early retirements. The public sector does not seem to recruit from either inactivity or unemployment meaning that all recruitment occurs from new labor market entrants exiting educational establishments.

Overall, transitions involving the public and private sectors are not many and they are particularly low for urban males while they are high for rural females. Transitions seem to decline for all groups during the four years considered. Upwards transitions dominate downward transitions with all upward transitions being well above 50%.

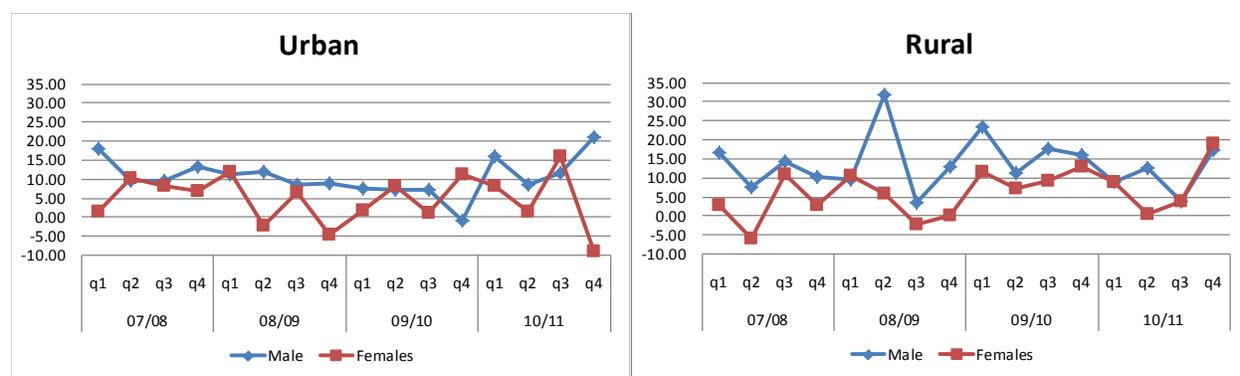
Table 5 – Transition flows between public and private sectors (% of total transitions)

	Urban								Rural							
	Male				Female				Male				Female			
	07/08	08/09	09/10	10/11	07/08	08/09	09/10	10/11	07/08	08/09	09/10	10/11	07/08	08/09	09/10	10/11
In-->Priv	17	16	15	16	29	28	28	28	29	31	29	26	50	49	52	51
In-->Pub	1	1	1	1	1	1	2	2	0	0	0	0	0	0	0	0
In-->Un	10	9	10	9	14	13	13	14	6	5	6	5	1	2	2	2
Priv-->In	14	15	15	14	26	27	25	27	25	24	24	25	46	46	43	44
Priv-->Pub	4	4	3	4	2	2	2	2	1	2	2	2	0	0	0	
Priv-->Un	18	18	18	17	5	6	6	6	16	14	13	15	0	1	1	1
Pub-->In	2	2	2	3	2	2	2	2	0	0	0	0	0	0	0	0
Pub-->Priv	4	4	6	3	2	2	2	2	2	2	2	3	0	0	0	0
Pub-->Un	0	0	0	0	0	0	0	0	0	0	0		0			
Un-->In	6	6	7	5	12	12	12	12	2	2	2	2	1	1	1	1
Un-->Priv	24	25	22	26	6	7	8	6	19	19	22	21	1	1	1	1
Un-->Pub	1	1	1	1	1	0	0	1	0	0	0	0				0
Upward	56	55	55	56	53	52	53	52	56	58	59	55	52	52	55	54
Total (% of pop.)	17	16	16	15	13	11	11	11	13	12	12	12	25	22	21	21

Source: Authors' estimations from LFSs 2007-2011. Priv.=Private; Pub.=Public.

The quarterly transitions (Figure 8) confirm these trends and show some seasonal variations, more accentuated in rural area as compared to urban areas. The males' trend almost invariably dominates the females' trend in both urban and rural areas and shows only one negative spell overall whereas the females' trend has several negative spells in both urban and rural areas. However, we cannot talk of upwards or downwards mobility between public and private sectors as there is almost no mobility between the two sectors. The mobility in Figure 8 is almost entirely explained by the movements from inactivity to activity. All we can say is that the private sector performs better than the public sector in attracting the inactive and the unemployed while the public sector performs better in attracting the new graduates. Public sector jobs are clearly taken up early on in life and they are for life.

Figure 8 – Net Quarterly Upward Transitions between Public, Private and Inactivity Sectors (% of total transitions)



Source: Authors' estimations from LFSs 2007-2011.

Paid and unpaid workers. We consider here employees who declared to be on paid or unpaid work and the self-employed. Transitions between pay statuses are stronger in rural areas as compared to urban areas and they have distinct profiles for the four groups considered. The largest transitions for urban males are from unemployment to paid employment while for rural males are from unpaid to paid employment. These are both upwards transitions and the flow out of unemployment and into paid employment is a particularly good sign for the economy.

This is in contrast with females' transitions which are mostly from inactivity to paid employment in urban areas and from inactivity to unpaid employment in rural areas. This latter transition is the largest of all explaining over a third of all transitions for rural females. The second flow in terms of importance for rural women is from unpaid work to inactivity which means that women in rural areas mostly move from inactivity and unpaid work and vice-versa with little spells into paid work. This is probably explained by women working in the family fields seasonally or when men migrate for work. Nevertheless, this group is the most mobile of all. Urban women do better than rural women but they are also the group with the lowest mobility. Only about 11% of urban women change pay status every year. Overall upward transitions are well above 50% of all transitions for all groups but it is clear that the quality of the transitions in terms of pay is better for men than for women.

Table 6 –Transition across Pay Status (% of total transitions)

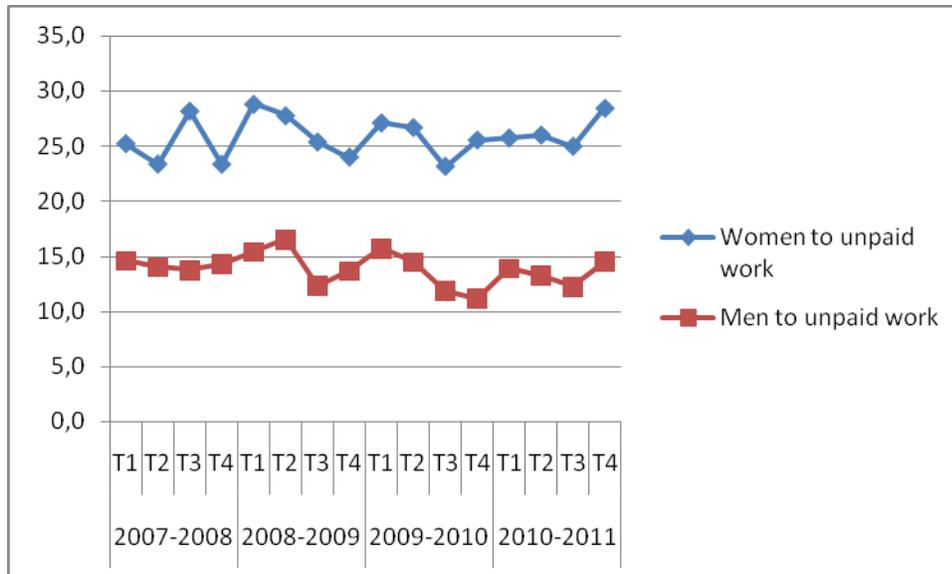
	Urban								Rural							
	Male				Female				Male				Female			
	07/08	08/09	09/10	10/11	07/08	08/09	09/10	10/11	07/08	08/09	09/10	10/11	07/08	08/09	09/10	10/11
In-->Paid	14	14	13	15	26	26	27	26	12	13	12	11	12	11	13	11
In-->Un	9	8	10	9	15	13	14	14	4	4	4	4	1	1	2	1
In-->Unp.	3	2	3	2	4	4	4	4	6	8	7	6	32	34	34	34
Paid-->In	14	15	15	15	23	25	24	25	13	13	13	12	8	10	10	11
Paid-->Un	16	16	17	15	4	6	6	6	7	6	7	7	0	0	1	0
Paid-->Unp.	4	4	4	4	1	1	1	1	15	16	12	17	3	5	4	5
Un-->In	5	6	7	5	13	12	12	12	1	2	1	1	1	1	1	1
Un-->Paid	22	23	21	24	7	7	8	6	9	10	11	11	0	1	1	1
Un-->Unp.	2	2	2	2	1	0	0	0	3	3	4	3	0	0	0	0
Unp.-->In	1	1	1	1	5	3	4	3	3	3	4	4	33	31	28	29
Unp.-->Paid	7	7	6	6	1	1	1	1	24	20	22	21	8	5	6	7
Unp.-->Un	2	1	2	2	0	0	0	0	3	3	2	3	0	0	0	0
Upward	57	56	55	58	53	52	53	52	58	57	61	56	54	52	55	54
Total (% of pop.)	18	17	16	16	12	11	11	11	20	18	18	18	28	24	24	24

Source: Authors' estimations from LFSs 2007-2011. Unp=Unpaid.

If we consider quarterly data for the entire 2007–2011 period, the structural situation and the gender gap does not vary significantly (Figure 9). We can observe significant quarterly changes and a slight tendency to improvements for men while for women the tendency seems negative with more women falling into unpaid work. For men, the largest transitions (urban and rural together) are between salaried and self-employment with the transition into self-employment dominating on average by about two percentage points. For women, the largest transitions are between inactive and unpaid work, which together account for over 45% of all transitions. This is followed by transitions between inactive and salaried, both directions accounting for about 17% of all flows. This confirms the very significant gender gap in terms of pay status with females

participation characterized by unpaid work in rural areas with almost no role for unemployment as a springboard to employment.

Figure 9 – Transitions to unpaid work 2007-2011



Source: Authors' estimations from LFSs 2007-2011.

Full-time and part-time/occasional workers.⁸ The work time status depicts as before sharp differences across groups. The highest transitions for urban males are from unemployment to full-time work while for urban females the largest transition is from inactivity to full-time work. As we already saw, women are less likely to pass through unemployment to access employment and the transitions into employment are mostly from inactivity. Rural males tend instead to move between full-time and part-time or occasional employment. During the period 2007–2009 the downward transitions from full-time to part-time/occasional dominated while the opposite is true for the period 2009–2011, which signals an improvement in the labor market situation in rural areas and for this group. The transitions that dominate for rural females are instead from inactivity to full-time employment and vice-versa and this is true for the whole period 2007–2011. The fact that the transitions from inactivity to full-time employment are higher than the reverse flow is positive but we saw that this employment tend to be unpaid. Hence, the only news here is not a positive one in that unpaid work for women and rural women in particular tends to be full-time.

We can also remark that mobility across work time statuses for rural women is the largest as compared to all other transitions flow observed in the paper (bottom line in the table). Almost a third of rural women experience a change in work time status every year. As noticed in previous tables, labor mobility decreases for all groups during the period considered.

⁸ Note that the distinction between the different categories is not calculated from work-time but derives from a specific question asked to respondents.

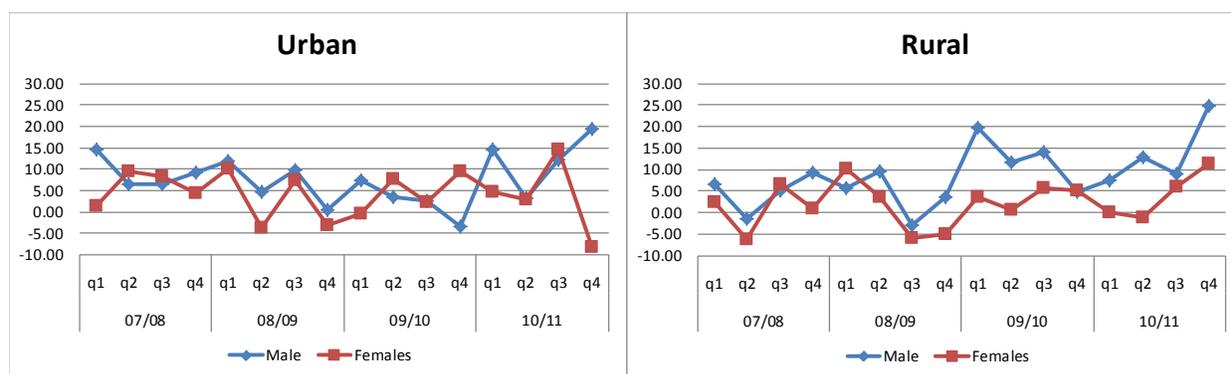
Table 7 –Transition Across Working time status (% of total transitions)

	Urban								Rural							
	Male				Female				Male				Female			
	07/08	08/09	09/10	10/11	07/08	08/09	09/10	10/11	07/08	08/09	09/10	10/11	07/08	08/09	09/10	10/11
FT-->In	13	14	14	14	23	22	21	22	14	12	12	12	22	20	17	15
FT-->PT,Occ.	9	10	11	9	2	4	3	5	21	24	21	19	12	15	16	16
FT-->Un	15	15	14	13	4	5	6	5	7	7	6	6	0	0	0	0
In-->FT	15	14	13	13	24	24	23	22	15	15	13	13	24	22	20	19
In-->PT,Occ.	1	1	2	2	6	5	7	6	2	3	4	2	15	14	17	17
In-->Un	9	8	9	8	14	13	13	13	3	3	3	3	1	1	1	1
PT, Occ.-->FT	7	8	7	10	2	4	3	4	20	20	23	26	11	13	12	13
PT,Occ.-->In	1	1	1	1	5	6	5	5	2	2	3	3	14	13	13	16
PT,Occ.-->Un	2	2	3	2	0	0	1	1	2	1	2	3	0	0	0	0
Un-->FT	21	20	18	20	7	6	7	6	9	9	10	9	1	0	0	0
Un-->In	5	5	6	4	12	12	11	11	1	1	1	1	1	1	1	1
Un-->PT,Occ.	2	3	3	3	0	1	1	1	3	2	3	3	0	0	0	0
<i>Upward</i>	55	53	51	56	53	52	53	51	53	52	56	57	51	50	52	52
<i>Total (% of pop.)</i>	19	18	18	17	13	12	11	12	21	21	21	20	33	30	30	30

Source: Authors' estimations from LFSs 2007-2011. FT=Full Time; PT Occ=Part Time or occasional.

Turning to the quarterly data (Figure 10), the absolute majority of transitions occurred to better statuses if we rank inactive, unemployed, occasional work, part-time-work and full-time work in this order. We can also observe some improvements over time. For women, the situation is also positive but less positive as compared to men, although the gender gap is less marked than what was observed under other categorizations. Overall, the upward transitions tend to be larger than the downward transitions throughout the period 2007-2011 but we also find several negative spells for women and one negative spell for men in both urban and rural areas.

Figure 10 - Net Upward Quarterly Transitions between Full-time, Part-time and Occasional work (% of total transitions)



Source: Authors' estimations from LFSs 2007-2011.

Formal and informal employment. According to the ILO (2002), informal employment is defined by job characteristics, including the lack of contract or the lack of social security. In our analysis, informal

employment is defined as employment not covered by social security. Informal employment may or may not be voluntary but a recent literature on developing countries found that in countries such as Argentina, Brazil and Mexico informal employment is mostly of a voluntary nature (Bosch and Maloney, 2010).

Transitions between formal and informal employment are very consistent across the four groups considered. Transitions from inactivity to informal work are the largest for all groups and all years with the exception of urban males. For this group, the most important transitions are from unemployment to informal and vice-versa. Therefore, transitions into informality from other sectors are much larger than transitions into formality.

The most mobile of the groups are urban men and rural females with over 20% of people in these groups changing status every year. As previously observed, upwards mobility dominates but mobility seems to decline over time for all groups. Also positive is the fact that flows that involve formality have tended to increase for both men and women while flows that involve informality seem to have decreased for men.

Table 8 –Transition across Formal and Informal Employment (% of total transitions)

	Urban								Rural							
	Male				Female				Male				Female			
	07/08	08/09	09/10	10/11	07/08	08/09	09/10	10/11	07/08	08/09	09/10	10/11	07/08	08/09	09/10	10/11
F->I	11	12	12	12	5	5	6	6	9	6	8	8	0	1	1	1
F->In	3	3	3	4	5	5	6	6	0	0	1	1	0	0	0	0
F->Un	1	2	2	2	1	2	1	1	0	1	0	0	0	0	0	0
I->F	13	14	14	16	7	7	7	5	8	10	10	9	1	1	1	1
I->In	10	11	11	9	20	21	19	20	21	20	20	22	46	45	42	43
I->Un	14	13	13	12	4	4	5	4	13	12	11	12	0	1	1	1
In->F	2	2	2	2	4	5	6	5	0	1	1	0	1	0	1	1
In->I	12	12	11	11	24	22	21	23	24	26	24	23	48	49	51	50
In->Un	8	7	8	7	13	12	12	13	5	5	5	5	1	1	2	2
Un->F	2	2	2	2	2	1	2	1	1	0	1	1	0			0
Un->I	19	19	17	19	5	5	5	5	16	17	19	18	1	1	1	1
Un->In	5	5	5	4	11	11	11	11	1	2	2	2	1	1	1	1
<i>Upward</i>	56	55	54	57	54	53	53	51	54	58	58	55	52	52	55	54
<i>Total (% of pop.)</i>	21	20	20	20	14	13	12	12	15	14	14	13	25	22	22	21

Source: Authors' estimations from LFSs 2007-2011. F=Formal; I=Informal

5. Summary and discussion

During the past twenty years Morocco has implemented a wide range of economic and social reforms that have delivered in terms of growth and population welfare. More recently, the country has been able to deliver on these two dimensions during a volatile period characterized by a major global shock and sharp variations in agricultural production. Yet, these positive developments are not reflected by the main labor market indicators as it has been observed elsewhere in developed and developing economies alike. This paper investigated the question of whether - behind these labor market aggregates - we could find positive

developments in terms of transitions to better sectors or transitions to better jobs. Based on the findings, we are now in a position to provide tentative answers to some of the critical labor market questions in Morocco.

Have labor market indicators really been “stable”? The estimation of all labor market aggregates that we provided in the paper confirms that these aggregates have been largely stable with the exception of the unemployment rate which shows a slow but consistent decline. The triangular diagram proposed (Figure 3) also showed that this stability reigns in very different camps for the four population groups considered with a clear ranking across groups (rural and urban men and rural and urban women in this order). Small changes in the main labor market indicators are visible but movements are not large and there is no convergence across groups over time. The unemployment rate is a less interesting indicator in a country like Morocco with a very large informal sector and its decline seems mostly explained by exits to inactivity rather than employment.

Have people been mobile? Results point to significant patterns in labor mobility across labor categories with profiles that vary according to the population group considered (urban/rural, male/females). About a quarter of the population experience some form of labor market mobility every year and it is clear that rural women are the most mobile group with up to a third of this group changing labor status every year. Labor mobility *per se* can be a positive or a negative development in an economy depending on the type of mobility and the factors that determine mobility. The paper looked in depth into the profile of mobility by population group.

Have people improved labor market status? Overall upwards mobility dominates, which means that workers have - on average - improved their labor market status but this varies significantly across population groups. Men and urban residents have done better than women and rural residents and not all groups have enjoyed improvements in labor market status. This also varies depending on the labor market dimension considered although rural women are the single group that is consistently the worse off in terms of mobility. The gender gap is typically larger in rural areas as compared to urban areas. Unemployment plays a significant role mostly for men while it plays no role for rural women. When women join employment they do that most frequently from inactivity rather than unemployment. We can also observe changes in mobility over time in both directions but with an overall trend of decreasing mobility.

Improvements in labor market status vary according to the sectors we consider. Reallocation of labor across economic sectors and across the private and public sectors is not a dominant feature of the labor market. Women are as mobile and sometimes even more mobile than men but most of the mobility for females occurs between agriculture and inactivity. There are negligible transitions between the public and private sectors. The public sector in particular hires young people out of education and keeps these people throughout their working careers with little or no recruitment of middle aged workers. Public jobs are taken early in life and they are for life. The informal sector plays a much greater role in mobility than the formal sector. For both men and women, the formal sector accounts for less than 10% of total transitions. Transitions between formal and informal employment are lower for women as compared to men.

Have people moved to better jobs? There are no clear improvements in terms of job quality explained by a certain trade-off between employment remuneration and employment duration. Workers seem to have moved to more unstable positions in terms of remuneration but improved on the contract duration. On both accounts, women have done worse than men. There is a large flow of people that moves every quarter into unpaid work and this phenomenon is much larger for women than for men. For women, nearly half of mobility occurs between inactivity and unpaid work with a small difference between the directions of the flow between these two statuses. For men, by far the largest transition occurs from salaried to self-employed.

Interestingly, mobility between two statuses that characterize different types of jobs and different types of workers such as the salaried and the self-employed are actually very high for men. Over time, there is a slight tendency to improvements for men while for women the tendency seems negative with more women falling into unpaid work. Therefore, men do much better than women and, if we consider self-employment as a less stable employment status than salaried workers, then both genders lost in terms of employment stability. In terms of statutory working time, the situation in Morocco has improved during the 2007-2011 period. For men, the most important transitions have occurred from inactive and unemployed people to full-time workers. For women, the situation is less positive as compared to men. The largest transition flows are between inactive and full-time (but unpaid) work.

Can we explain jobless growth? GDP growth and poverty reduction co-existed with stable labor market indicators (employment, unemployment and labor force participation rates) and also significant labor mobility. This phenomenon can be attributed to three main factors: 1) Results of a GDP growth decomposition (Table 1) showed that the bulk of growth can be explained by increases in productivity. This is consistent with the labor mobility analysis that shows overall improvements of workers' status; 2) The GDP growth decomposition also showed that the second factor of growth relates to changes in the working age population. This is consistent with our other finding that new labor market entrants outpaced job creation; 3) Net bilateral flows between labor statuses are small which means that workers move often in and out of the same sectors, despite the marginal dominance of upwards transitions. This is also consistent with the literature on labor mobility (Jovanovic and Moffitt, 1990).

What role for economic shocks? Morocco seems to have been quite successful in coping with the 2007–2009 global financial crisis partly because of good weather and good agricultural seasons in a country where agriculture still represents an important share of GDP. While this paper did not address causality between economic shocks and labor mobility, we observed remarkable quarter to quarter swings in labor mobility (particularly in rural areas) suggesting that exogenous economic shocks are at work. These shocks are probably more domestic than global and mostly driven by the relative performance of agriculture versus other sectors of the economy. The global financial crisis had its dearest consequences in countries characterized by highly developed financial and banking systems and had smaller effects on economies that remain largely agricultural with little developed financial and banking systems. We should not forget, however, that the years considered saw remarkable changes in global prices which were not induced by the global crisis but heritage of a decade of global price shocks. These price changes may also have affected asymmetrically different markets contributing in this way to labor mobility.

Some policy implications. While it is still premature to derive clear policy recommendations, the results presented in this paper provide some new evidence on areas that may have been neglected by the policy maker. We discuss here a few points.

One lesson that we learned from our analysis is that the labor market in Morocco is mobile and not as static as the main labor market statistics would suggest. A higher mobility generally allows for a better labor allocation over time and this should be seen as a positive fact overall. However, mobility across economic sectors and between the public and private sectors is very sclerotic and a sign that industrial policies and public sector reforms are lagging behind and need to be re-thought. If industrial policies and enterprise restructuring were vibrant, we should observe a much higher mobility across economic sectors while a modern public administration should encourage rather than discourage exchanges with the private sector. These are two areas that the policy maker would need to address.

A second lesson from this first analysis on labor mobility is that employment policies need to be more inclusive and target explicitly marginalized groups. The population of Morocco has gained in terms of welfare overall but this progress has occurred via non-inclusive labor market developments. Women have not improved their labor market status and, if anything, they are more dependent on their male counterparts as ever before. Rural women in particular seem to function as a 'shock absorber' for the economy. When the economy is doing well, rural women participate to the labor market in greater numbers but when the economy suffers this group is the first – and often the only group - to be excluded. There is more to be understood about why this happens but a first lesson for policy makers is that policies need to focus also on group specificities, not just employment growth. Leaving rural women behind may accommodate short-term economic shocks but will hamper long-term growth.

A third lesson is that policies designed to increase female labor participation should focus more on how to retain jobs in addition to finding jobs. Perhaps surprisingly, women are as mobile as men. While stock measures such as the LFPR look 'stable' for both genders and very grim for women, the actual share of women who move across labor statuses is high and comparable to that of men. Women want to participate and do participate in great numbers. In any point in time the share of women participating is low but the share of women who participate during the year is large. Therefore, many of the women that do participate are unable to hold on to their jobs. There is more to be understood on this question but the paper showed that the policy maker should also focus on better understanding the individual characteristics of women and design policies that enhance those characteristics that would help women retaining their jobs.

A fourth policy issue relates to the chronic underemployment in rural areas. Some of the results presented in this paper would suggest that in times of crisis men replace women. When the economy is weak, rural men working in urban areas seem to go back to rural areas and, by doing so, push women out of the fields and back to inactivity. Vice-versa, when the economy performs well, rural men take jobs in urban areas and they are replaced by women in the fields. These compensation mechanisms suggest that rural areas have an excess of labor force that, we saw, does not transit via unemployment. Job creation of non-farm jobs would seem one of the keys to address this issue, a process that may need specific investments and labor market policies and programs.

Another aspect is the quality of employment and how this may affect the society at large. Improved welfare conditions seem to have come with some costs in terms of employment stability. This is a known effect of the processes of liberalization and privatization. These processes foster growth and employment creation but also render employment more unstable, less predictable and emphasize the divide between winners and losers that has psychological and social implications for workers. This is related to the need for more labor inclusive policies and the gender divide in terms of performance discussed above and something to consider more closely in the years to come.

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Appendix

Table A1 – Population Shares by Labor Group (2007)

		Urban Male	Urban Female	Rural Male	Rural Female
Type of activity	Employed	61.6%	15.5%	78.7%	36.8%
	Unemployed	9.9%	4.1%	4.0%	0.7%
	Inactive	28.5%	80.4%	17.4%	62.5%
	Total	100.0%	100.0%	100.0%	100.0%
Formal vs. Informal	Formal	17.3%	6.5%	4.4%	0.3%
	Informal	44.3%	9.0%	74.2%	36.5%
	Unemployed	9.9%	4.1%	4.0%	0.7%
	Inactive	28.5%	80.4%	17.4%	62.5%
	Total	100.0%	100.0%	100.0%	100.0%
Pubic vs. private	Public	9.6%	3.4%	1.6%	0.1%
	Private	52.0%	12.1%	77.1%	36.7%
	Unemployed	9.9%	4.1%	4.0%	0.7%
	Inactive	28.5%	80.4%	17.4%	62.5%
	Total	100.0%	100.0%	100.0%	100.0%
Agr vs. Ind/Ser	AGR	3.4%	0.8%	53.6%	33.3%
	Ind/Ser	58.2%	14.7%	25.1%	3.5%
	Unemployed	9.9%	4.1%	4.0%	0.7%
	Inactive	28.5%	80.4%	17.4%	62.5%
	Total	100.0%	100.0%	100.0%	100.0%
Paid vs. Unpaid	Paid	58.2%	14.4%	57.1%	7.7%
	Unpaid	3.4%	1.0%	21.6%	29.1%
	Unemployed	9.9%	4.1%	4.0%	0.7%
	Inactive	28.5%	80.4%	17.4%	62.5%
	Total	100.0%	100.0%	100.0%	100.0%
Full-time vs. Part-time & other	Full time	58.5%	14.3%	70.6%	22.1%
	PT& Other	3.1%	1.2%	8.0%	14.7%
	Unemployed	9.9%	4.1%	4.0%	0.7%
	Inactive	28.5%	80.4%	17.4%	62.5%
	Total	100.0%	100.0%	100.0%	100.0%

Annex – Technical Issues in Working with Transition Matrixes

When working with transition matrixes and sample panel data the estimation of weights can be problematic. If both samples in both points in time were random samples and the populations in the two years were identical, the question of weighting could be ignored as weighted and non-weighted samples would produce approximately the same transition probabilities. However, sampling often includes stratification, clustering and over and under-sampling across strata, clusters or specific areas or groups of individuals. This raises a number of issues related to sampling weights in estimations of transition probabilities. In addition, attrition bias may require the use of post-sampling weights. We discuss the main issues below.

Over and under-sampling. If sampling includes over-sampling or under-sampling of the population, not using sampling weights may bias the relative importance of the categories used in the transition matrix. By definition, sampling weights are the inverse of the probability of being sampled. If data include sampling weights, this probability is not equal across all households surveyed. Suppose for example that rural areas were over-sampled to better capture agricultural consumption and suppose we want to estimate transition probabilities across economic sectors: industry, agriculture and services. Non-use of sampling weights will result in an over-estimation of the agricultural sector in both periods, which means an over-estimation of people leaving the agricultural sector to enter other sectors and an under-estimation of people entering the agricultural sector.

Change in weights over time. When the population changes, annual sampling weights also change. In this case, one has to decide whether to use weights in year one, year two or a combination of both. The most common approach is to use weights in year one but this is satisfactory only if the sampling and weighting schemes have not changed over time. If they have changed, one would have to find a combination of the two weights. In our case, the panel considered is only of one year and we know that the sampling method has not changed while we can safely assume that the population structure changes little over a one year period. We have therefore opted to work with weights in year one.

Attrition. When using panel observations, attrition over the period may artificially reduce and bias the panel sample. In this case, we need to introduce weights that would correct for this bias and reconstruct a panel sample representative of the population. In our case, we have attrition, although this phenomenon is generally rather small. However, all estimations made with sampling weights are also corrected for attrition. This ensures that all statistics can reproduce exactly the national statistics. In fact, one advantage of using weights is that we can also estimate the population flows across sectors in terms of numbers of people.

Annual and quarterly weights. Finally, different weights have been constructed for annual and quarterly estimations. This allows reconstituting population statistics for the year and also for the quarters given that all quarter samples are representative of the population.

Forward and backward approaches. One additional question regards the direction of the analysis. To clarify this question, suppose that we wish to understand the flow out of employment and into unemployment and inactivity. This can be done simply by constructing a transition matrix with initial weights as described above and follow the employed in year t to the year $t+1$. However, this is different from taking the employed in year $t+1$ and looking backward at where these people were in year t . This “backward” exercise can also be done with a transition matrix but the results of the two exercises will be different. We call these two approaches *forward* approach and *backward* approach. The choice of the two approaches depends on what we wish to measure, whether exit from employment or entrance into employment for example. In this paper, the first

“forward” approach is used to illustrate transitions across various states for the movers, those who change status over time.

The example below constructed on the transition flows between employed, unemployed and inactive shows the difference between using the forward and backward approach and also the effect of non-using weights. The backward and forward approaches provide very close (but not identical) results while the non-weighted approach shows significantly different results. Note that these differences occur over a time lag of one year only, which is what we use throughout the paper. But if one estimates transition matrixes over longer periods of time, these differences may become very large. In this paper we will focus on the forward approach while we correct the weights as illustrated above.

Table 3 – Test of Backward, Forward and Non-weighted approach (2007-2008)

		Forward weighted	Backward weighted	Non weighted
Unemployed	Employed	11.91	11.91	11.02
Inactive	Employed	35.64	35.73	36.63
Unemployed	Unemployed	8.98	9.05	8.19
Inactive	Unemployed	7.26	7.52	7.09
Employed	Inactive	31.28	30.93	32.21
Unemployed	Inactive	4.94	4.86	4.85

Source: Authors’ estimations from LFSs 2007-2011.