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THE EVOLUTION OF SOCIAL SECURITY IN JORDAN'S
LABOR MARKET: A CRITICAL COMPARISON BETWEEN
PRE- AND POST-2010 SOCIAL SECURITY REFORM

Ibrahim Alhawarin and Irene Selwaness

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THE EVOLUTION OF SOCIAL SECURITY IN JORDAN'S LABOR MARKET: A CRITICAL COMPARISON BETWEEN PRE- AND POST-2010 SOCIAL SECURITY REFORM¹

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Abstract

Jordan has undergone a profound social security reform since 2010, primarily aiming to ensure the financial sustainability of the system over time. The reform measures mainly included increasing the age of early retirement and the minimum contributions required to claim it, increasing employee and employer monthly contributions, covering even micro firms (with at least one employee), and allowing the self-employed and inactive housewives to voluntarily participate. Using data from the 2010 and 2016 Jordan Labor Market Panel Survey (JLMPS), this paper examines the dynamics of Jordanian workers' access to social security before and after the 2010 reform and the coverage incidence across different firm sizes and workers' characteristics. The paper also explores the time it takes to acquire social security coverage on the labor market before and after the reform. Moreover, trends in early retirement incidence among middle-aged male workers are examined. Our findings show that the overall incidence of social insurance coverage appears to slightly increase in 2016, for private sector wage workers, irregular wage workers, and non-wage workers (employers and self-employed). Workers starting in the public sector were the most likely to acquire social insurance coverage at the start of their jobs, followed by the private wage workers inside establishment. Both men and women who started their first job after the 2010 reform experienced a decline in their proportion of acquiring social insurance coverage upon their job start. Moreover, the average incidence of early retirement slightly declined among men while still being highly prevalent around ages 40-46.

JEL Classifications: H55, J26, J32, J46, C41

Keywords: Social Security, Coverage Gap, Informality, Pensions, Early Retirement, Survival Analysis, Jordan

ملخص

شهد الأردن إصلاحًا كبيرًا في مجال الضمان الاجتماعي منذ عام 2010، يهدف في المقام الأول إلى ضمان استدامته المالية بمرور الوقت. وتضمن الإصلاح تدابير تشمل أساسًا رفع سن التقاعد المبكر، وزيادة الحد الأدنى للاشتراكات اللازمة لاستحقاقه، وزيادة الاشتراكات الشهرية التي يسددها الموظف وصاحب العمل، مع تطبيق ذلك حتى على أصغر الشركات (التي تضم موظف واحد على الأقل)، والسماح لربات البيوت اللاتي يعملن لحسابهن الخاص وغير النشطات بالمشاركة في نظام الضمان الاجتماعي طوعًا. وباستخدام بيانات من 2010 و2016 التي شملها المسح التتبعي لسوق العمل الأردني، تبحث هذه الورقة ديناميكيات الحصول على الضمان الاجتماعي قبل وبعد إصلاح عام 2010 وحدوث تغطية تشمل شركات مختلفة الأحجام، وتضم عمالة مختلفة الخصائص. كما تستكشف الورقة الوقت الذي يستغرقه الوصول إلى تغطية الضمان الاجتماعي لسوق العمل قبل الإصلاح وبعده. وعلاوة على ذلك، يتم فحص الاتجاهات في معدلات التقاعد المبكر بين العمال الذكور في منتصف العمر. وتشير النتائج التي توصلنا إليها إلى أنه يبدو أن المعدل العام لمظلة التأمينات الاجتماعية سجلت زيادة طفيفة في عام 2016، للعاملين في القطاع الخاص بأجر بالإضافة إلى العمالة غير المنتظمة، والعاملين بدون أجر (أرباب العمل والعاملين لحسابهم الخاص). كان أولئك الذين بدأوا عملهم الأول في القطاع العام هم الأكثر احتمالًا للحصول على تغطية التأمين الاجتماعي، يليهم العمال بأجر داخل المنشأة. وقد شهد الرجال والنساء الذين بدأوا أول عمل لهم بعد إصلاح عام 2010 انخفاضًا في نسبة حصولهم على تغطية التأمين الاجتماعي عند بداية عملهم. وعلاوة على ذلك، فإن متوسط معدل التقاعد المبكر انخفض بشكل طفيف بين الرجال بينما لا يزال سائدًا بدرجة كبيرة حول سن 40-46.

1. Introduction

After remarkable economic growth rates during the previous decade, Jordan's economy has experienced a period of severe economic slowdown since 2010. As per the Central Bank of Jordan, while GDP growth rates (in constant prices) ranged between 4.2% and 8.6% in the period 2000-2009, they fell to less than 3% subsequently (Central Bank of Jordan 2017; International Monetary Fund 2009). This decline was mainly the result of the recent socio-political instability hitting the region. The various sectors of the economy, especially commodity exports and tourism, considerably suffered. These problems were accompanied by a drop in the domestic revenues of the government and an accelerated growth in the public debt, which exceeded 95% of GDP in 2016 (Ministry of Finance 2017). Likewise, unemployment rates have risen steadily, reaching as high as 18.5% by the end of 2017 (DoS 2018).⁴ In this weak economic environment, Jordan has embarked on several reform initiatives, aiming at boosting economic growth and curbing public debt and expenditure.

Importantly also, Jordanian policy makers paid a great deal of attention to the reform of pension systems, which faced important sustainability challenges (ILO 2017b). The country has been experiencing an important early retirement trend where the share of early retirees (those retiring prior to age 60 for men and 55 for women) among all retirees in Jordan increased from 78.8% in 2008 to 80.5% in 2009, according to the annual report of the Social Security Corporation (SSC 2009). The early retirement trend is observed in an era of critically low labor force participation rates, particularly among women and middle-aged men as documented in previous studies (Alhawarin 2014; Assaad 2014; Mryyan 2014; Abu Jaber 1991). Earlier work also pointed to a high rate of informality in the private wage sector (55%), particularly among small firms with less than five employees (92%), partly implying a lack of social insurance coverage (Assaad 2014).

Coupled with financial sustainability issues, the above patterns induced Jordan to introduce important new reform measures to its social security schemes in 2010, followed by a second round of corrective measures in 2014. This reform of social security schemes aimed at primarily ensuring the financial sustainability of the social security fund over time, in order to achieve social and gender equality as well as to expand social protection coverage (ISSA 2010; Razzaz 2011).

The new social security laws enacted in 2010 and 2014 aimed at expanding social security coverage, mainly by trying to enroll informal workers, through covering firms composed of one employee or more, the self-employed and the employers. The laws also intended to encourage voluntary participation among out of labor force housewives, by extending maternity leaves, as well as Jordanians living or working abroad (Brodmann, Jillson, and Hassan 2014). Moreover, these laws incorporated several legal and “parametric” changes. The latter indicates changes in the basic parameters of the scheme such as contribution rates, eligibility criteria, or benefit formulas. These changes primarily aimed to create incentives against early retirement, in order to make social security schemes less generous, hence improving its financial sustainability, as well as to gradually tighten the early retirement eligibility conditions.

In the light of these reforms, using the two rounds of Jordan Labor Market Survey (JLMPS) in 2010 and 2016,⁵ this paper aims to examine the evolution of social security coverage and the early

⁴DoS online database: <http://dosweb.dos.gov.jo/18-5-unemployment-rate-during-the-fourth-quarter-of-2017/>. Last accessed March 5th 2018.

⁵The JLMPS 2016 data are publicly available as of May 2018 from the Economic Research Forum Open Access Micro-Data Initiative at: <http://www.erfdportal.com/>

retirement trends among Jordanian workers, and how such an evolution is associated to the 2010 and 2014 reforms. The following issues are investigated:

- 1) Coverage incidence across different employment statuses.
- 2) Coverage incidence in the private sector across economic activities, sizes, and characteristics of firms.
- 3) Potential changes in patterns of early retirement.
- 4) Whether social security comes at first entry, and how long it takes to acquire social security coverage on the labor market.

Examining the dynamics of Jordanian workers' access to social security is important for a better understanding of informality and the issues of coverage gap in MENA countries' labor markets. It is also important to understand the evolution of social security coverage in Jordan in the light of the 2010/2014 changes in pension regimes. The lack of data about social security in the MENA region is considered as one of the serious challenges to understand and improve the social protection system, in general and pension systems, in particular (ILO 2017b; Price et al. 2017). Thus, JLMPS 2010 and 2016 provide an excellent opportunity to understand the mechanism of access to social security coverage and the dynamics of retirement in one of the MENA countries, Jordan.

Following this introduction, Section 2 introduces the basic elements of the current social security system while Section 3 discusses the recent reforms in Jordan and the consequent reduction in pension levels. Section 4 presents the descriptive analysis of the dynamics of social security coverage including the coverage incidence and the time it takes to the first socially covered job. The patterns of early retirement are discussed in Section 5. Finally, the conclusion and policy implications are discussed in Section 6.

2. Overview of Jordan Social Security System

In early 1940s, the government of Jordan initiated the first public mandatory retirement scheme targeting two groups of workers, civil servants and military forces (Al-Zoubi 2013). In 1959, the government approved two new acts to enhance the social protection of these two groups, namely the Civil Retirement Law and the Military Retirement Law. By 2003, these two publicly-funded pensions were closed. All new hiring contracts in the government and the army became covered by the social security pay-as-you-go schemes, which initially targeted private sector workers. It is estimated that by 2060, Jordan will have a unified social security system (Robalino et al. 2005) where public sector and private sector workers will be solely covered by one agency, the Social Security Corporation (SSC).

As for social protection in the private sector, the vast majority of workers remained socially unprotected until the late 1970s (Al-Zoubi 2013). In addition to the massive enforced influx of Palestinian refugees into the country during late 1940s and 1960s, the transformation to a service-based economy and the migration of people from rural areas to urban cities, particularly to Amman (the capital), fueled the labor movements and demands for social protection. In 1955, the government enacted a law to compensate private workers for employment injuries, followed by the first labor law in 1960, which principally required private employers to provide their workers with a severance payment upon their end of work. This law encouraged large companies and banks

To learn more about the JLMPS 2016 data, see Krafft & Assaad (2018).

to initiate saving and compensation funds. A few labor unions and syndicates (e.g. Jordan Engineers Association) began to provide old-age retirement and saving funds starting from early 1960s (Alhawarin 2014; Al-Zoubi 2013).

The genesis of Jordan's first social security law was in 1978 (Law no. 30), which committed to comply with the ILO Social Security Convention, 1952 (No. 102) that specifies nine forms of social security.⁶ The government applied only four out of these nine social security forms, namely employment injury benefits, old-age benefits, survivors' benefits, and disability benefits. This law was subject to several modifications later, particularly in 2001. In 2010, the law has been profoundly redesigned and finally approved by the parliament with further slight changes in 2014.

3. Social Security Reforms of 2010

Table 1 tracks the most substantial legal changes that occurred in Jordan's social security system in recent years compared with 2001. The reform modified several measures related to pensions' calculation. Moreover, it involved adding two new forms of social security (i.e. maternity leave benefits and unemployment saving scheme).⁷ When the government issued the required detailed regulations, the latter two types became effective in September 2011, while excluding public sector employees who are covered by the government. According to Brodmann, Jillson, and Hassan (2014), by applying maternity insurance, the SSC attempts to lessen the obstacles facing the Jordanian female workforce through increasing their labor market participation and enhancing protection of their rights and entitlements during work such as providing pregnancy and maternity leaves. As for unemployment insurance, it provides protection for formal private wage workers against short spells of involuntary job loss. The benefits under this scheme are payable for up to 6 months. It aims to increase overall labor market participation primarily through mitigating workers' fear of losing their jobs. These workers used to consider early retirement as an alternative to job loss (Brodmann, Jillson, and Hassan 2014; Zureiqat and Shama 2015). However, these new forms of security require covered employees and their employers to pay additional monthly contributions, coupled with other gradual monetary increases required for other types of insurance (see Table 1). Potentially, such additional labor costs might limit the efforts to increase formal employment and to enhance compliance with the regulations imposed by the social security law.

As shown in Table 1, the new law of 2010, and its amendments in 2014, introduced several adjustments to the pension system. Notably, these new measures aimed at creating incentives to delay retirement. This was done by reducing accrual rates particularly for high wage earners, by raising the early retirement age, and by increasing vesting periods for both male and female workers.

3.1 Changes in Old-age Retirement Regulations

Although the age of compulsory retirement (old-age) remained unchanged at 60 and 55 years old for men and women, respectively, the new regulations incorporated several measures that are expected to change pension levels. Compared to 2.5% in 2001, the accrual rate currently used in pension calculation depends on wage levels, by applying a lower rate beyond a certain wage

⁶This includes nine aspects of social security: medical care, sickness benefit, unemployment benefit, old-age benefit, employment injury benefit, family benefit, maternity benefit, disability benefit, and survivors' benefit. http://www.ilo.org/secsoc/areas-of-work/legal-advice/WCMS_205340/lang-en/index.htm. Last Accessed September 20th 2017.

⁷Furthermore, the latest law explicitly refers to workers' right of medical care. The SSC starts promoting, through social dialogue, such a form of insurance in 2017 with the aim to activate it later.

ceiling. Specifically, average wage levels are divided into two yearly inflation-adjusted layers, with a 2.5% accrual rate for the first layer that is up to a monthly wage ceiling of 1500 JD and 2% for the second one for any average wage level beyond 1500 JD. Such average wage levels are calculated for a reference period over which pensions are determined, as discussed below.

To encourage delaying retirement beyond the compulsory age (60 years old for men and 55 years old for women), accrual rates have been designed, under the new law, to increase gradually reaching 3% at the fifth year beyond this retirement age. Retirement benefits are adjusted proportionately based on accrual rates and the number of contribution years. As for pension calculation, while the social security law of 2001 used the average gross wage over the last two years, the new regulations in 2010 use the last three years prior to retirement as the reference period for measuring the average wage. Furthermore, according to the 2010 new regulations, such average wages must not exceed 5000 JD monthly. This upper limit has further been decreased to 3000 JD monthly in 2014, yet allowed to increase over time, through indexing it to inflation rates as measured by the Consumer Price Index (CPI) or the nominal wage index, whichever is lower. It is worth mentioning that the process of linking wages, that are used to calculate pensions, as well as retirement benefits to certain indices only applies for retirees older than 60 years old. Hence, early retirees do not benefit from any wage adjustment until they get the mandatory age of retirement (60 years old for men, and 55 years old for women).

The second important change was to raise contribution rates. Monthly contributions paid by employers and employees according to the legislation. The basic contribution rate represented 14.5% of gross wage (9% obtained from the employer and 5.5% from the employee) in 2010. It has been raised gradually since 2014 to reach a total of 17.5% in 2017.

3.2 Changes in Early Retirement Regulations

The reform in social security introduced fundamental changes in the early retirement regulations for with an objective to slowdown the early retirement phenomenon observed in the last decade (see Table 1). First, in order to lower early retirement pensions, instead of referring to the last 24 months (two years) in calculating the monthly average wage used to calculate the pension, the new law changed the reference period to become the last 60 months (five years) prior to early retirement. Second, the law of 2010, followed by its 2014 amendments, increased the minimum number of overall contributions that should be paid over the working years and required to become eligible for early retirement from 216 to 252 (i.e. 21 years of monthly contributions) for men and from 180 to 228 (i.e. 19 years of monthly contributions) for women. This applies for those retiring at age 50 or more. In case of claiming retirement between ages 45 and 49, the required number of contributions is higher, and should reach at least 300 or more (practically 25 years of work). As for pension calculation for those retiring early, while the same formula as old-age pensions is used, early retirement pensions are subject to further reductions based on retirement age. For example, in the previous law, if a worker retired at the age of 50 rather than at 60, his or her entitlement was to be discounted by 9%. Such reduction rates were increased by 1 to 2 percentage point in the new law. Pensions of men retiring at the age of 50 are now reduced by 11% (cf. Appendix Table 1 for a detailed illustration of old-age and early retirement benefits calculation). Moreover, under the new law, early retirement monthly benefits are not adjusted to inflation or nominal wage growth until reaching the mandatory age of retirement, as explained above. Then, they become indexed with inflation after reaching this age.

It is important to mention that all covered workers aged 45 or above when the new regulations became effective, i.e. in 2014, had the right to retire under the previous abolished law of 2001. Also, softer conditions apply for workers who were aged between 42 and 44 when the laws became effective. For instance, a male worker aged 44 years old in 2014 still had the option to retire early under the previous law of 2001 but at age 46 and conditional on having at least 228 contributions (SSC 2015).

Table 1 The main changes in social security system in Jordan (2001 vs. 2010/2014)

Law	2001	2010/2014	
Age of Mandatory Retirement	Men: 60. Extendable to 65 (conditions apply) Women: 55. Extendable to 60 (conditions apply)	No Change	
Minimum contributions (old age)	180 (15 years)	No Change	
Age of Early Retirement	45	Adjusted to 50 in 2010 and then back to 45 in 2014.	
Minimum contributions (early retirement)	Men: 216 (18 years) Women: 180 (15 years)	In 2010 Men: 300 (25 years) Women: 264 (22 years)	In 2014 300 (25 years) if age is between and 45 and 49 Men: 252 (21 years) if age is above 50 Women: 228 (19 years) if age is above 50
Pension calculation (Old age)	- Fixed accrual (2.5%). - Pensions are calculated on average gross wage in the last 24 months (2 years) in service.	- Variable accrual rate: 2.5% for monthly average wage up to 1500 JD, 2% for wage levels above 1500 JD. - Accrual rates increase gradually reaching 3% at the fifth year beyond the compulsory retirement age (60 for men and 55 for women). - Benefits are calculated based on the average gross monthly wage in the last 36 months (3 years) in service.	
Pension Calculation (Early retirement)	Same as above, with some discounts of pension income as follows:	Same as above, with some discounts of pension income as follows:	
	- Men: 18% if age is 45, then gradually decreases to become 1% if age is one year below the compulsory retirement age - Women are subject to lower discount rates (highest is 12%)	- Discount increased by 2 p.p.* for each age and for both men and women compared with 2001. - Pension benefits depend on the average gross monthly wage in the last 60 months (5 years) in service.	
Other important amendments	- No maternity leave insurance and no unemployment insurance - Early pension receivers can return to formal sector but <i>cannot</i> keep any of their pension income.	- Both maternity leave and unemployment insurances - Increase in monthly contributions by around 3%. - Early pension receivers can return to formal sector and keep part of their pension income.	

Source: Authors' calculations based on Social security laws (2001, 2010 and 2014).

Notes: * p.p. stands for percentage points.

3.3 A Simulation of Changes in Old-age and Early Retirement Pensions Before and After the Reforms

A numerical example based on the formulas used by the SSC to calculate pensions under the new and previous laws can better clarify how the new measures would influence pensions and increase monetary penalties of early retirement. As pension calculation differs according to many conditions, we impose certain assumptions. We calculate pensions for several reference wage levels under both the new and the previous laws for a single male worker. For each wage level, the pension income and its ratio relative to the reference wage (replacement ratio) under the two laws are calculated. Additionally, we assume that the worker claims his retirement after 25 years in

service.⁸ In Figure 1 and Figure 2, we show the change in old-age and early retirement pensions, respectively, measured as percentage ratios to various reference wage levels, before and after the new social security laws.

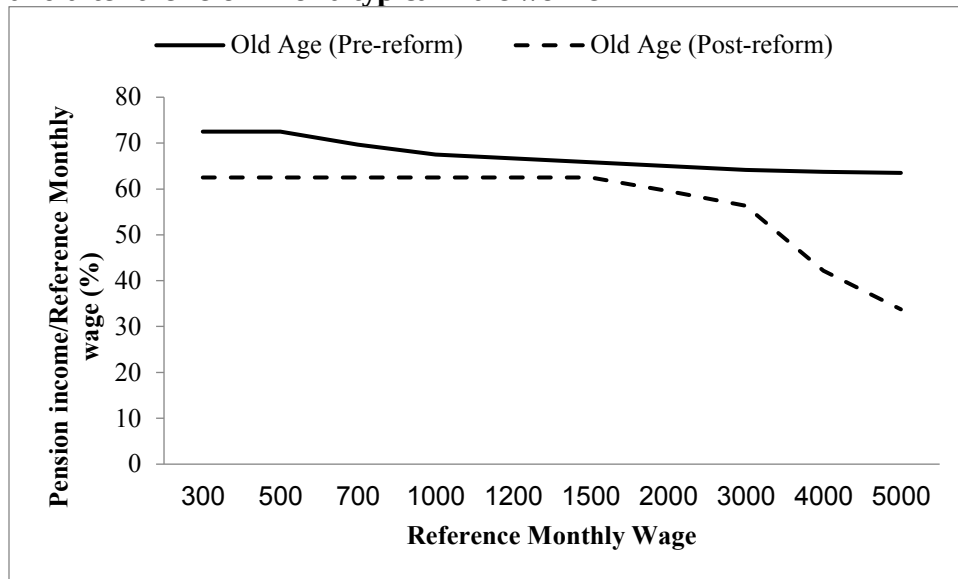
Figure 1 shows that retiring at the mandatory age of retirement (60 years old) results in lower pension levels under the new regulations in comparison with the previous ones. Using the pension calculation formula of the previous law, for wages below JD 700, the retiree can obtain between 70 and 73% of the reference average monthly wage on which pension is measured. This replacement ratio further decreases to become lower by around 10 percentage points for higher wages (63.5% for a wage level of JD 5000). On the other hand, mainly due to increasing the reference period over which the monthly wage used in pension calculation is averaged, from 24 to 36 months and lowering accrual rates for higher wages, old-age pensions under the new regime do not exceed 65% of the reference average monthly wages. Under the new regulations, particularly for wages exceeding JD 1500, the decline in retirement benefits affects higher earners more than lower earners. Such a decline becomes even more pronounced for wages above JD 3000. For example, for an average monthly pay of JD 5000 or more, the retiree will not be able to obtain more than 35% of his reference average wage. This pattern is attributable to the introduction of the upper limit of reference wages, which was set at JD 3000 in 2014. This reform measure leaves room for the introduction of a voluntary social security scheme for high earners (Bogomolova, n.d.).

According to the previous social security law, pensions were reduced if workers opted for early retirement. Such a pension reduction is further increased under the new law amendments regardless of the wage level, potentially leading to higher opportunity costs of choosing an early withdrawal from the labor market. For those retiring at age 50, their pension levels are now subject to a deduction of 11% after the reform compared with 9% before the reform. Accordingly and based on the same assumptions as above, Figure 2 repeats the calculations carried out in Figure 1, but for early retirement pensions. In general, the figure shows similar patterns, as the reform leads workers to receive lower early retirement pensions compared with that received under the previous law, particularly for higher wage levels.

As a whole, clearly the regulative adjustments in the current law aim at encouraging workers to stay after the age of 50 in the labor market. However, coupled with the fact that the new law stipulates new provisions such as unemployment insurance and maternity leaves, hence related-contributions and increased the existing monthly contributions, the evolution of retirement age and incidence of social security coverage following these reforms is hard to predict. Therefore, this paper aims at updating the knowledge about the evolution of social security coverage expansion and retirement trends following the 2010/2014 reforms.

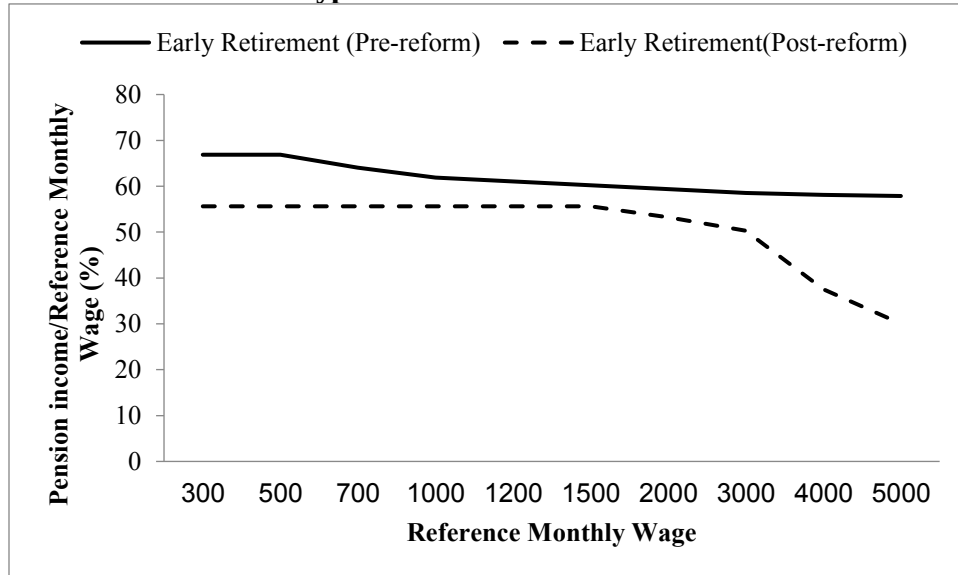
⁸ The detailed method of pensions calculation, as applied by the SSC and the various assumptions made to calculate loss simulations are presented Appendix Table 1.

Figure 1 Old-age pensions as a percentage of reference monthly wages before and after the reform for a typical male worker



Source: Authors' calculations based on the current and previous social security laws

Figure 2 Early pensions as a percentage of reference monthly wages before and after the law for a typical male worker



Source: Authors' calculations based on the current and previous social security laws

4. Dynamics of Social Security Coverage

4.1 The Evolution of Coverage Gap by Type of Employment

Despite all the efforts to expand coverage, an important share of the Jordanian working population is still not covered by any social security scheme. The incidence of social security coverage substantially varies by employment status and the institutional sector of work, as presented in Table 2 which shows the percentage of workers enrolled in social security by type and sector of work and by gender in 2010 and 2016.

A first look at the data shows that the share of socially insured workers in the public sector has surprisingly declined by almost 18 percentage points from 99% in 2010 to 81% in 2016. Such a decline was more pronounced among men (19 percentage points from 99% in 2010 to 80% in 2016) than among women (8 percentage points from 97% in 2010 to 89% in 2016). As a matter of fact, this decline is likely due to how the question was worded in the 2016 round. There are two social security funds for the public sector employees with different names, one that is known as “retirement pension” scheme/fund and the other as “social security” scheme/fund. The 2010 round asked individuals whether or not they were enrolled in both schemes, “retirement pension” and “social security,” whereas the 2016 round only asked about the enrollment in the “social security” scheme, assuming that the word “social security” would be perceived to include for all types of social security schemes. However, that was not the case. Due to confusion, some respondents, who were indeed enrolled in the “retirement pension” scheme, have reported themselves not enrolled in the “social security” scheme, thus uncovered. For instance, we found that an important share of public sector workers who reported being socially uncovered in 2016, i.e. not enrolled in the “social security” scheme, work in state-run economic activities, namely the defense activities, public order/safety activities, preschool, primary, and secondary education, and hospital activities. It is not realistic that workers in these state-run economic activities lack social security coverage. Thus, we proceeded to reclassify these workers as socially covered, as presented in the second panel of Table 2. After such reclassification, the overall coverage rate, for all workers, and the coverage rate in the public sector changed in a way that is more aligned with recent official and international reports (SSC 2016; ILO 2017a). Therefore, we opt to use this reclassification in the remainder of our analysis of the social security coverage.

More specifically, the coverage rate in the public sector in 2016 reached around 94% for men, and 96% for women, leading to an overall rate of 95%. Thus, between 2010 and 2016, there was a 5 and 1 percentage point decline in coverage rates for male and female public sector workers, respectively (see the second panel of Table 2).

Table 2 The percentage of workers covered by social security, by institutional sector and gender, Jordanians age 15-64, JLMPS 2010 and 2016

	Males		Females		Total	
	2010	2016	2010	2016	2010	2016
Before Classifying State Employees						
Self-Employed	1	5	0	8	1	5
Employer	5	16	24	7	6	16
Unpaid Fam. Wrk.	0	7	0	0	0	5
Irregular Wage	1	8	0	33	1	11
Private Regular Wage	46	53	66	69	50	57
Public Sector	99	80	97	89	99	81
Total	57	53	75	75	60	57
N	4,503	4,610	982	975	5,485	5,585
After Classifying State Employees						
Self-Employed	1	5	0	8	1	5
Employer	5	16	24	7	6	16
Unpaid Fam. Wrk.	0	7	0	0	0	5
Irregular Wage	1	8	0	33	1	11
Private Regular Wage	46	53	66	69	50	57
Public Sector	99	94	97	96	99	95
Total	57	59	75	78	60	63
N	4,503	4,610	982	975	5,485	5,585

Source: Authors' calculations using JLMPS 2010 and 2016.

Note: (i) The market definition of employment for a reference period of three month is used. (ii) The second panel of the table shows the updated coverage rates in the public sector when all employees in the public sector who worked in the following state-run economic activities, namely the defense activities, public order/safety activities, preschool, primary, and secondary education, and hospital activities were considered as socially covered.

Overall, between 2010 and 2016, the access to social insurance coverage has increased from 60% to 63% for all workers, from 57% to 59% among men, and from 75% to 78% among women. It has slightly increased for some categories of workers such as irregular wage workers, and non-wage workers (employers and self-employed), especially among men,⁹ as well as private sector regular wage workers for men and women.

As for the latter category, there was a slight improvement in the access to social security coverage, hence formal employment (Figure 2). Specifically, the overall share of regular wage workers enrolled in social security in the private sector increased from 50% to 57% between 2010 and 2016, with an increase of around 7 percentage points among men (from 46% to 53%) and of around 3 percentage points among women (from 66% to 69%).

As for irregular wage work, the coverage is still very limited, with a slight increase in 2016 compared to 2010. Overall, the share of covered irregular wage workers increased from 1% in 2010 to 8% in 2016 among men.¹⁰

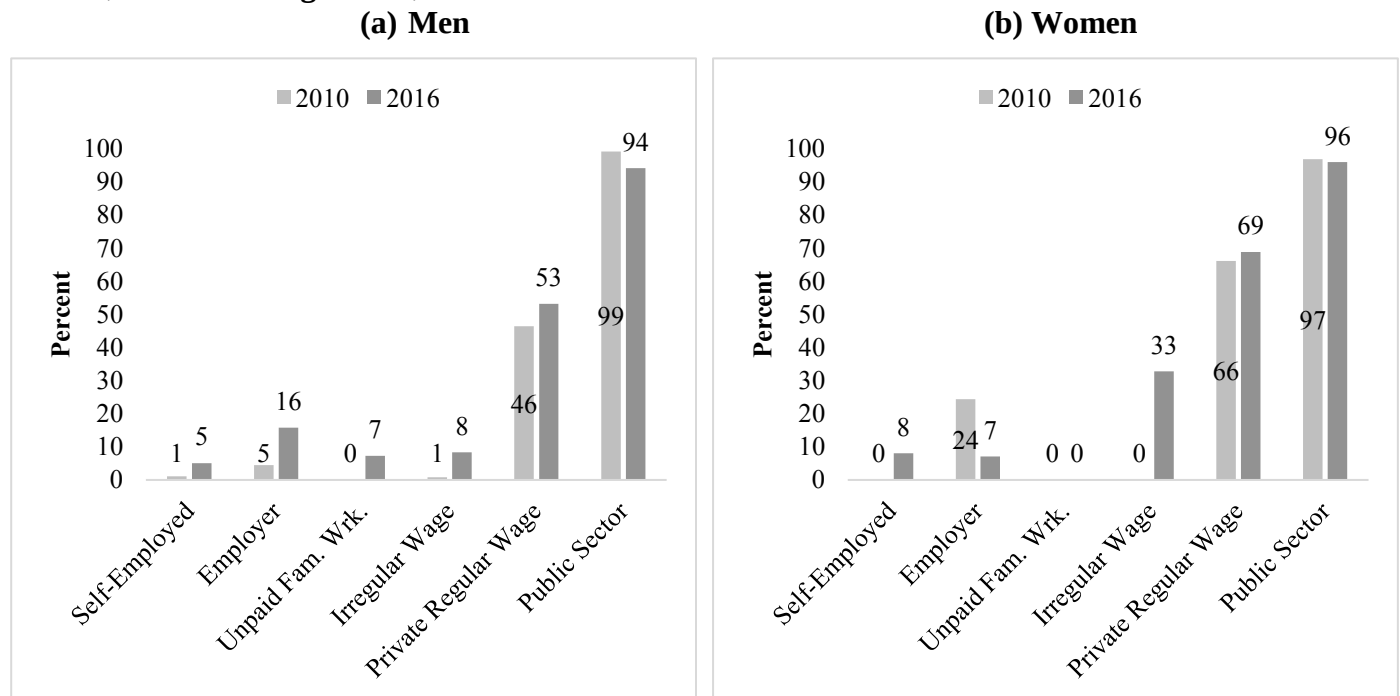
It is important to note the rise in the share of insured non-wage workers (employers and self-employed) in 2016 among men. They are three times more likely to have social security in 2016

⁹ There are few observations for women who work as employers (10) or self-employed (22), in unpaid family work (11), and in irregular wage work (29) in 2016. This is why we limit the coverage analysis of these categories to men.

¹⁰ While this is the case for irregular female wage workers, their sample is generally too small (5 observations in 2010 and 29 observations in 2016) to be able to generalize.

(16% among employers and 5% among self-employed) than in 2010 (5% among employers and 1% among self-employed). The rise in social insurance coverage among employers and self-employed can be associated with the new reforms, that mainly targeted these categories of workers and enhanced law enforcement.

Figure 3 The percentage of workers covered by social security, by institutional sector and round, Jordanians age 15-64, JLMPS 2010 and 2016



Source: Authors' calculations using JLMPS 2010 and 2016.

Notes: (i) The market definition of employment for a reference period of three month is used.

A main question of interest is about who benefited from this slight expansion of social security coverage among the private sector wage workers, and whether or not small firms experienced the coverage increase intended by the reforms. Table 3 shows the percentage of covered workers in the private sector by economic activity, occupation, firm size, whether the job is in or out of establishment, as well as by individual characteristics such as education level, whether or not the individual is a household head, and marital status for men and women, separately for 2010 and 2016.

Table 3 The percentage of workers covered by social security, workers in private sector wage work, by job and individual characteristics, gender and year, Jordanians ages 15-64, JLMPS 2010 and 2016

	Men				Women			
	2010		2016		2010		2016	
	Percent	N	Percent	N	Percent	N	Percent	N
Socially Insured	46	1640	53	1302	66	378	69	369
Economic activity								
Agriculture	21	46	21	43				
Broad Manufacturing	58	431	63	361	75	70	69	60
Construction	34	148	56	87				
Wholesale & retail trade, hotel & restaurant	29	455	46	367			62	45
Transp., storage & communication	42	238	41	116				
Other Services	69	322	60	311	70	240	70	245
Occupation								
White-collar, high-skilled	78	324	72	371	78	201	78	240
White-collar, low-skilled	43	465	45	331	52	84	36	59
Blue-collar, high-skilled	29	426	41	294	45	36		
Blue-collar, low-skilled	38	425	47	291	56	57	58	39
Firm Size								
1-4 workers	10	407	10	325	17	62	36	48
5-9 workers	26	158	34	146	63	45	47	30
10-24 workers	56	139	57	201	72	66	60	93
25-49	75	144	73	164	78	54	90	82
50-99	86	133	85	116	89	39	84	40
More than 100/DK	88	426	81	350	93	95	83	76
Work inside establishment								
No	1	233	18	144				
Yes	53	1407	57	1158	69	361	69	366
Education Level								
Illiterate or Read & Write	22	334	38	260	37	48		
Below Secondary	37	686	45	459	50	59	52	52
Secondary	58	377	56	318	67	127	64	104
University and Above	79	243	73	265	80	144	77	197
Head of Household								
Otherwise	39	658	51	466	69	354	70	348
Head	51	982	54	836				
Marital Status								
Never Married	39	642	53	436	68	223	72	204
Ever Married	51	998	54	866	64	155	66	165

Source: Authors' calculations based on JLMPS 2010 and JLMPS 2016.

Notes: (i) The market definition of employment over a reference period of three month is used. (ii) Small cell sizes of less than 30 observations are suppressed.

As shown above, although women in private sector wage work are more likely (66% in 2010 and 69% in 2016) to be socially insured than men (46% in 2010 and 53% in 2016), between 2010 and 2016, the incidence of social security coverage among men has increased by 15% compared to a 5% increase among women. Generally, male and female workers are more likely to be socially insured in bigger firms than in smaller firms. This is observed for both 2010 and 2016. For instance,

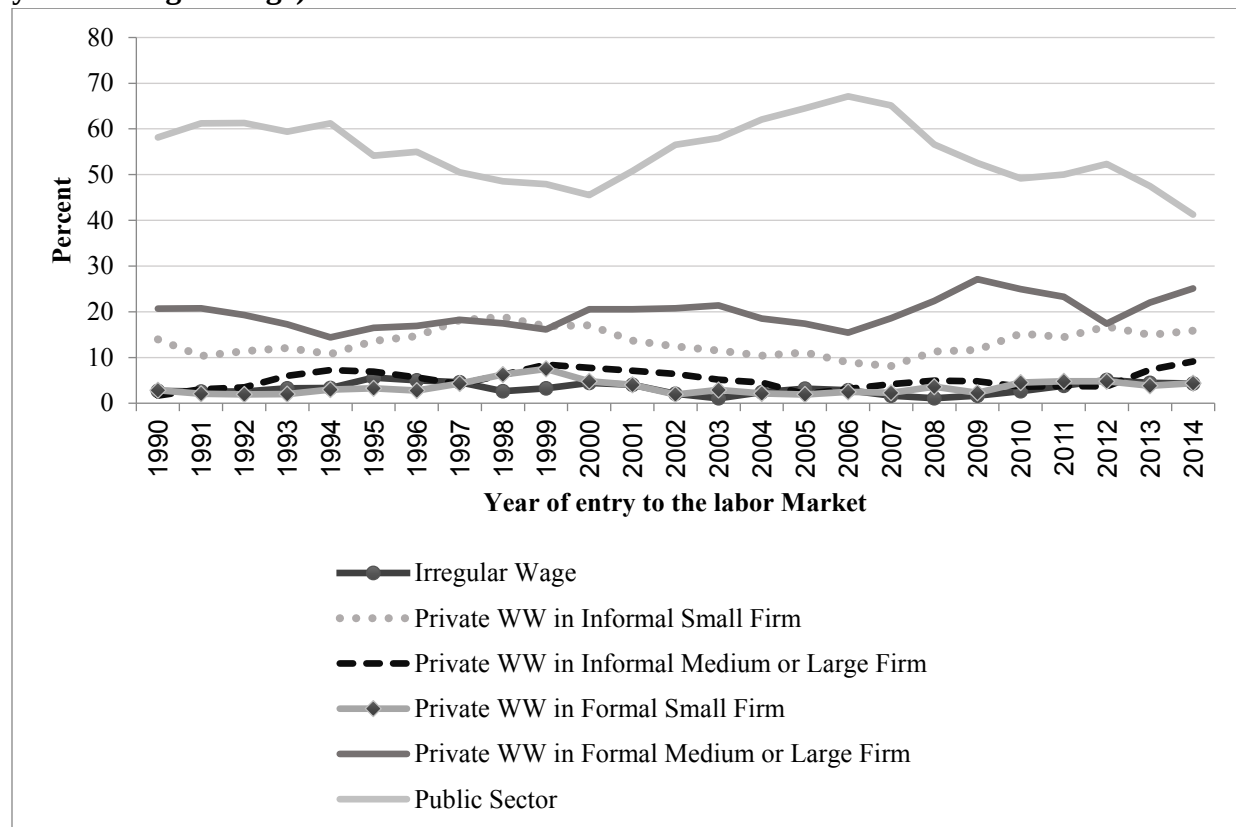
around 26% (2010) and 34% (2016) of male workers in firms with five to nine employees were covered, compared to around 56-57% (for both years) in firms with 10 to 24 workers, and around 73-75% in firms of 25-49 employees and 85-86% in firms of 50-99 employees. The coverage rate among male workers in micro firms, employing less than five employees, does not exceed 10% for both years. It is noteworthy that the coverage rates for women are higher than that of men for most of the firm sizes. As for the evolution between 2010 and 2016, male workers' coverage rates increased in firms with five to nine workers (by around 8 percentage points from 26% in 2010 to 34% in 2016) and almost stalled in both firms with one to four workers (10%) and those with 10-24 workers (around 1 percentage points from 56% in 2010 to 57% in 2016). Surprisingly, men in bigger firm sizes (25-49 workers), (50-99 workers) or (100+/don't know) experienced slightly lower coverage rates in 2016 than in 2010. As for women, they became more likely to have social insurance coverage in firms with less than five employees in 2016 (36%) than in 2010 (17%), and in firms with 25-49 workers in 2016 (90%) than in 2010 (78%). Their coverage rates declined for other firm sizes.

As expected, the coverage gap is much more pronounced among outside establishment workers than those who work inside an establishment. Yet in 2016, the percentage of socially insured men who work outside establishment substantially increased to 18%, up from 1% 2010.¹¹ Moreover, male workers inside an establishment became more likely to acquire social insurance coverage in 2016 (57%) than in 2010 (53%). The coverage rates among women working inside establishments almost stalled at 69% for both years.

Thus, there seems to be a slight narrowing in the social security coverage gap for male workers outside establishments, and to a lesser extent for those inside establishments, for male workers in firms of five to nine workers, and for female workers in micro firms of less than five workers. However, coverage rates declined in bigger firms of 25 workers and more, for men and those of 50 workers and more for women. Such a decline might be associated with the increased hiring cost for employers after the rise in contribution rates (Brodmann, Jillson, and Hassan 2014), a hypothesis that can serve in understanding those trends. It is possible that bigger firms have more ability - on the ground - to escape complying with the law than the smaller firms, as a response to such increased contribution rates. Therefore, they maybe more likely to cover only some workers and easily avoid penalties.¹² Over the last few years, the ability of the private sector to generate formal jobs has deteriorated, especially for new entrants, who are predominantly male.¹³ Using retrospective data from JLMPS 2016, we further examine these patterns, specifically by analyzing the type of first jobs that different cohorts of new entrants to the Jordanian labor market had access to. Figure 4 shows the distribution of first waged jobs by institutional sector and by formality status and size of the first job firm, for Jordanian male new entrants. The formality status of the first job firm is defined as firms that provide either contracts or social security to their workers. As for the size of the first job firm, we categorize it into two sizes: either micro (1-4)/small (5-9) versus otherwise (medium as 10-24, 25-49, 50 and above). This is because as shown in Table 3, there is an important gap in the coverage incidence between micro/small firms and other larger firm sizes.

¹¹ There are too few observations for women who work outside establishment to be able to analyze their coverage rates.

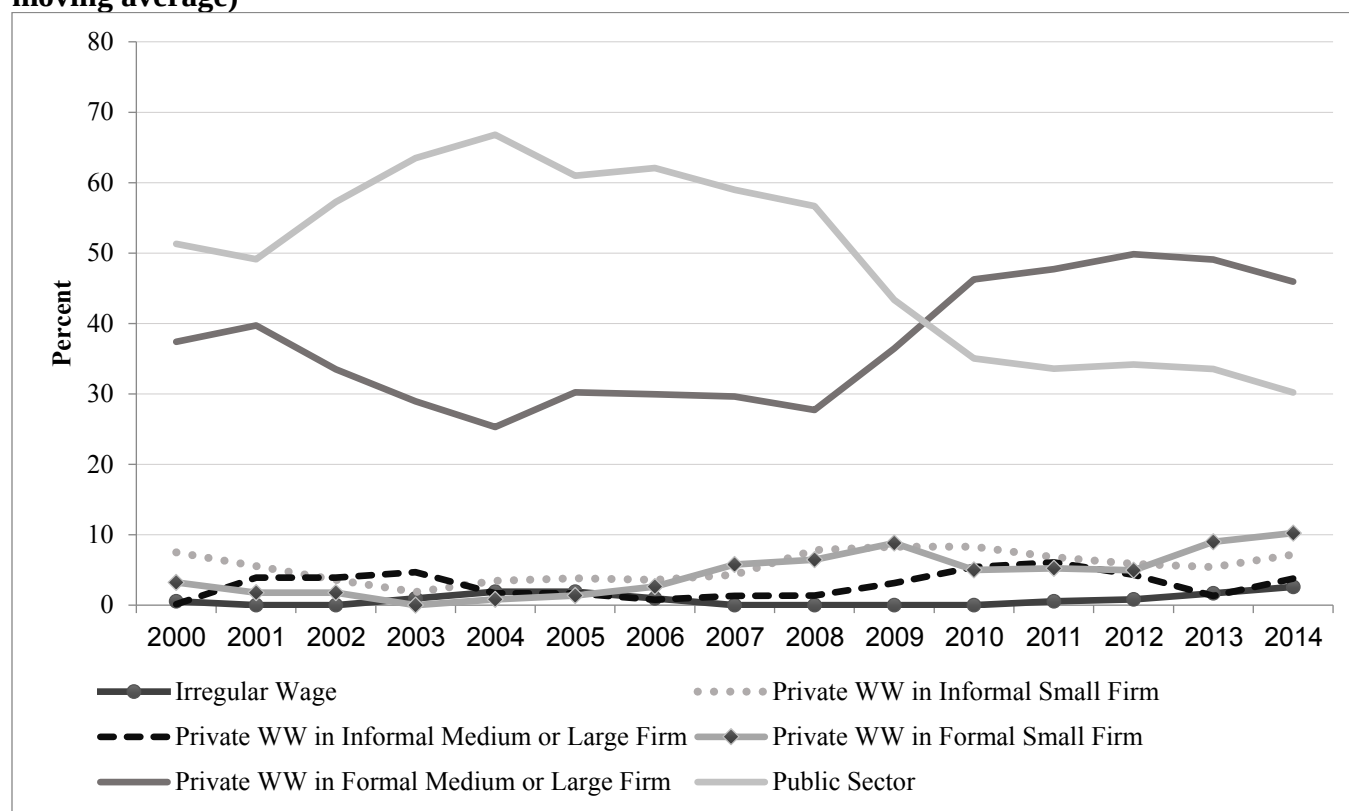
Figure 4 Distribution of first job by year of entry and employment status, formality and firm size of the first job firm, wage employment, Jordanian men aged 15-64, 1990 to 2014 (three-year moving average)



Source: Constructed by the authors using retrospective data from JLMPS 2016.

During the favorable economic growth period, there was an increase in the share of first jobs in private sector formal firms of medium and large sizes rising from 15% of first jobs starting in 2006 to 27% of first jobs starting in 2010. Then from 2010 onwards, there was a steady decline reaching a low of 17% in 2012, but again increasing to 25% in 2014. Yet, an increasing share of new entrants started their careers in informal small private sector firms (16% in 2014 up from 9% in 2006). This is in a period where the share of public sector first jobs declined substantially from 67% in 2006 to 41% in 2014. It is likely that new entrants who started their first jobs in informal small firms become socially covered as they gain more experience, transit to a formal firm, or because their employers become formal. Specifically, Appendix Figure 1 shows how the percentage of private sector regular wage workers who started in informal micro/small firms evolves with years of experience in the labor market. For instance, in 2006, the percentage of private regular wage workers in informal micro/small firms declined to 16% of private sector regular wage employment, after five years of experience, compared to 25% among new entrants. As for female new entrants, they usually self-select into formal jobs in the public sector or the private sector whether in medium/large or small firms, as shown below in Figure 5 and further in Section 4.2. These facts may be an explanation why women have higher coverage rates than men, while men experienced a greater improvement in social security coverage recently.

Figure 5 Distribution of first job by year of entry and employment status, formality and firm size of the first job firm, wage employment, women aged 15-64, 2000 to 2014 (three-year moving average)



Source: Constructed by the authors using retrospective data from JLMPS 2016

Lastly, it is interesting to explore how the coverage rates differ across individual characteristics. As expected, the more educated are more likely to have social insurance coverage. The prevalence of social security coverage in private sector wage work appeared to have improved noticeably for those with below secondary education, for both men and women. In contrast, coverage rates of higher-educated workers declined slightly. For the university and above category, the rates decreased by almost 6 percentage points (from 79% in 2010 to 73% in 2016) for men, and by almost 3 percentage points (from 80% to 77%) for women. This can be explained by the fact that the more educated are more likely to have jobs in bigger firms, which experienced an overall decline in their coverage rates. A second explanation can be found in the overall peaking unemployment rates among youth and new entrants, which remained in the double digits over the last seven years.¹² In such a context, it is likely that educated youth would be more likely to accept informal jobs in the start of their career, in order to gain more experience and enhance their later labor market opportunities.

¹²In 2015, youth unemployment (ages 15-24) reached 26.7% and 53.3% for men and women, respectively (DoS 2016a).

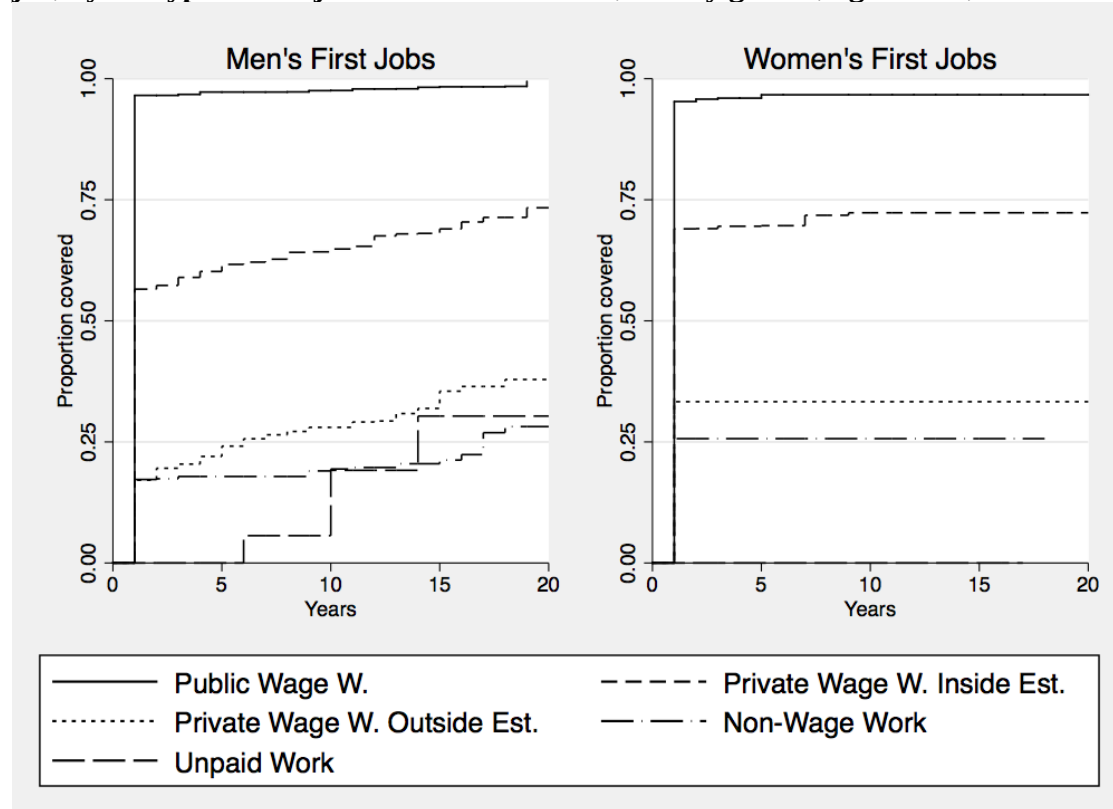
4.2 How Long Does it Take to Acquire Social Security Coverage?

Exploring the time dimension to acquire coverage on the labor market is of great importance to further understand the dynamics of the coverage gap and whether or not there exists an informality trap. This section uses the JLMPS 2016, which provides rich data on employment history covering information on the start and end date of each of the jobs that the individual has had, the employment status, economic activity, occupation, stability, social insurance coverage and the time to acquire it (if it did not come at first entry), formality of the firm, location, etc. Using this employment history module, we constructed the time it takes on the labor market to acquire social insurance coverage, by either switching jobs, or by waiting on the job till coverage is provided.¹³ We use survival analysis, mainly Kaplan-Meier estimates, in order to examine the duration to the first socially insured, hence formal, job. It also serves to show how coverage evolves over time by different starting, time invariant, characteristics that do not evolve over time such as the type of first job, the year cohort of the start of the first job, the education level, and whether the first job started before or after the 2010 reforms. We focus on the sample of Jordanians who ever worked at some point prior to the survey date, aged 15-64 in 2016.

Figure 6 shows the proportion of workers who acquire social security coverage by each year of work spent on the labor market since first entry (based on Kaplan Meier failure functions), distinguishing by the type of the first job (public sector, private wage employment inside establishment, private wage employment outside establishment, non-wage work, and unpaid family work). As expected, workers starting in the public sector are the most likely to acquire social insurance coverage at the start of their jobs (around 97% of men and 95% of women). The second best first job after a public sector one is the private wage work inside establishment, yet the proportion of covered workers in the latter is dramatically lower than that in the former. Specifically, the proportion of those who become covered immediately upon getting hired is around 57% among men and 69% among women. In 10 years of employment, the proportion covered among men and women who started in this type of first job reaches around 65% and 72%, respectively. This suggests that the lack of social security coverage is a relatively persistent state in the private sector if the wage worker could not get it immediately upon hire. Men starting as an outside establishment wage worker in the private sector or as a non-wage worker (employer or self-employed) are much less likely to acquire coverage than those starting in the public sector or private wage work inside an establishment. They face a probability of around 17% to be covered upon starting their jobs and remain persistently in informality, reaching coverage rates of around 28% for those starting in private wage work outside establishment and 19% of those starting in non-wage work after 10 years of work.

¹³This time variable does not include non-employment spells. Individuals are right censored if they leave the labor market without ever getting covered.

Figure 6 Proportion acquiring social insurance coverage by years since the start of first job, by the type of first job in the labor market, and by gender, ages 15-64, JLMPS 2016



Source: Authors' calculations based on JLMPS 2016

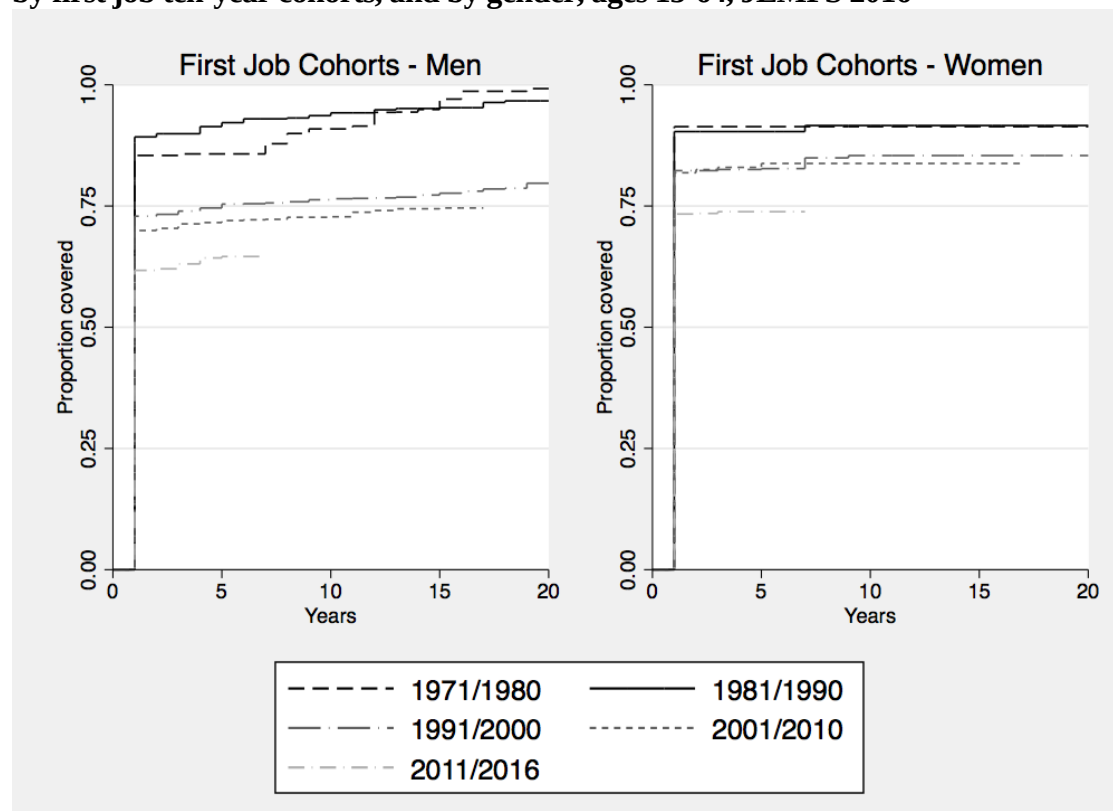
Note: Kaplan-Meier failure curves

The timing when first jobs started is another important aspect to examine, in order to see whether and how the coverage gap is different across generations. Figure 7 shows the proportion of workers covered at each year of work on the labor market (based on Kaplan-Meier failure curves). For men, those who started during the periods 1971-1980 and 1981-1990 were the most likely to acquire social insurance coverage upon entry (around 85% and 89%, respectively). Coverage was almost universal for these cohorts where the proportion of socially covered reached around 91-94% in 10 years since first entry to the labor market. This is primarily because the majority of workers entering the labor market between 1971 and 1990 worked in the public sector. The two following decades 1991-2000 and 2001-2010 marked an important change in the social insurance coverage. Men starting their first jobs during these decades were much less likely to acquire social insurance coverage at the start of their jobs compared to those who started during the 1970s and 1980s (around 73% for those starting during 1991-2000 and 70% for those starting during 2000-2010). Moreover, their coverage rates do not change much over time, stalling at around 73-77% in 10 years of employment. This might be due to the structural adjustment programs (SAP), which started in 1989 until the mid 2000s, through which Jordan primarily aimed at restructuring the economy, reducing the public debt and the chronic budget deficit, and strengthening the private sector. In effect, job opportunities in the public sector were gradually constrained. However, according to Assaad (2014), since the mid 2000s, public sector employment regained its increasing trend, which was prevailing before the application of SAP.

Women experience almost the same pattern as men. Those who started their first jobs between 1971-1980 and 1981-1990 were the most likely to be socially covered at the start of their jobs (around 91% and 90%, respectively), followed by women who started in the following two decades, mainly 1991-2000 and 2001-2010 (around 81%). It is important to note that the proportion of coverage among women does not evolve much over time, suggesting that women usually self-select in formal jobs that offer social security coverage immediately upon getting hired, particularly in the public sector. Labor market indicators lend support to this explanation, as women's labor force participation is very low and has even declined in the recent years, as a result of limited formal job opportunities created by the economy. The labor force participation for women was around 18% in the 1990s (World Bank 2005) and stalled around this level till 2012 (Assaad, Hendy, and Yassine 2014), then declined to less than 14% in 2016 (DoS 2016a). Therefore, working women are a select group.

New entrants to the labor market during the period 2011-2016, both men and women, have much lower probability of being covered at the start of their first jobs than those entering before 2010. The proportion of covered workers for this group ranges between 62% for men and 73% for women. Again, this highlights that new entrants in the Jordanian labor market work are more likely to start in informal jobs compared to earlier cohorts of entrants.

Figure 7 Proportion acquiring social insurance coverage by years since start of first job, by first job ten-year cohorts, and by gender, ages 15-64, JLMPS 2016



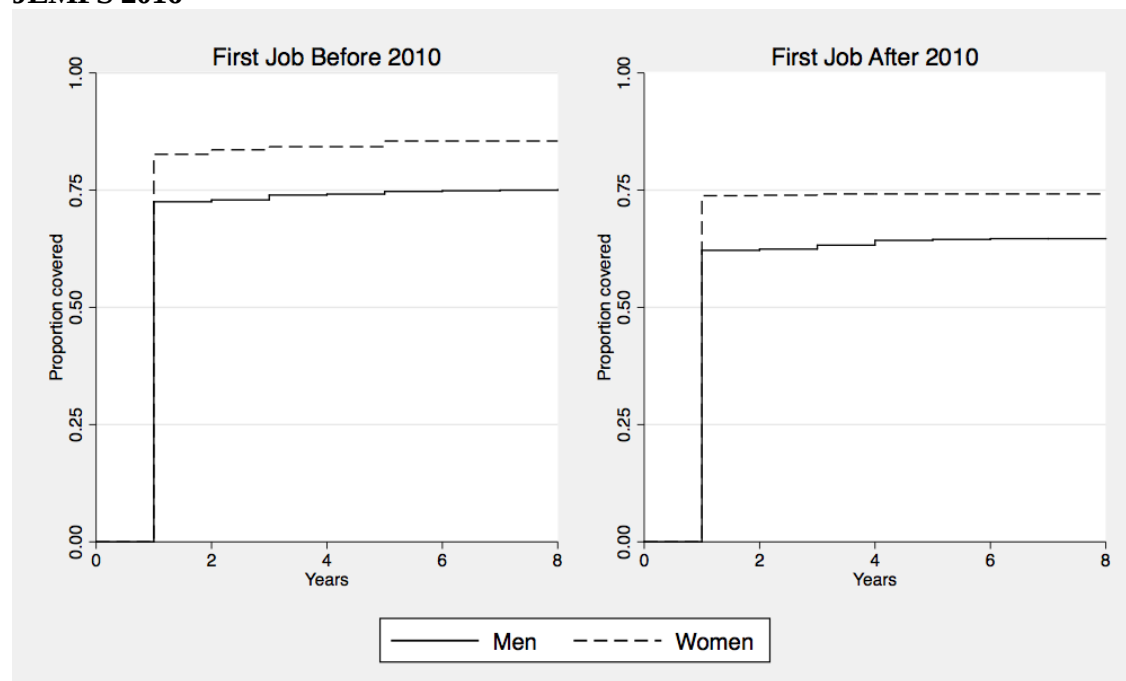
Source: Authors' calculations based on JLMPS 2016

Note: Kaplan-Meier failure curves

In the same line, it is interesting to explore the dynamics of coverage distinguishing between workers who started before the 2010 reforms and those who started in the aftermath of these reforms. For this purpose, we restrict the sample to those who started their first jobs in the past 7 years before the reform, i.e. during the period 2003 to 2009, to exclude earlier cohorts and to ensure more comparability with cohorts after the reform, i.e. those who started between 2010 and 2016.

Figure 8 presents the Kaplan-Meier failure curves showing the proportion of covered workers for each year of employment for those who started their first jobs before the 2010 reform and those who started it afterwards, separately. Both men and women who started their first job after the 2010 reform experienced a decline, with around 10 percentage point, in their proportion of acquiring social insurance coverage upon their job start. Specifically, around 75% of men and 85% of women who started before the 2010 reforms became covered at the start of their jobs, compared to around 62% of men and 74% of women who started after the reforms.

Figure 8 Proportion acquiring social insurance coverage by years since start of first job, by whether first job started before or after the 2010 reform, and by gender, ages 15-64, JLMPS 2016



Source: Authors' calculations based on JLMPS 2016

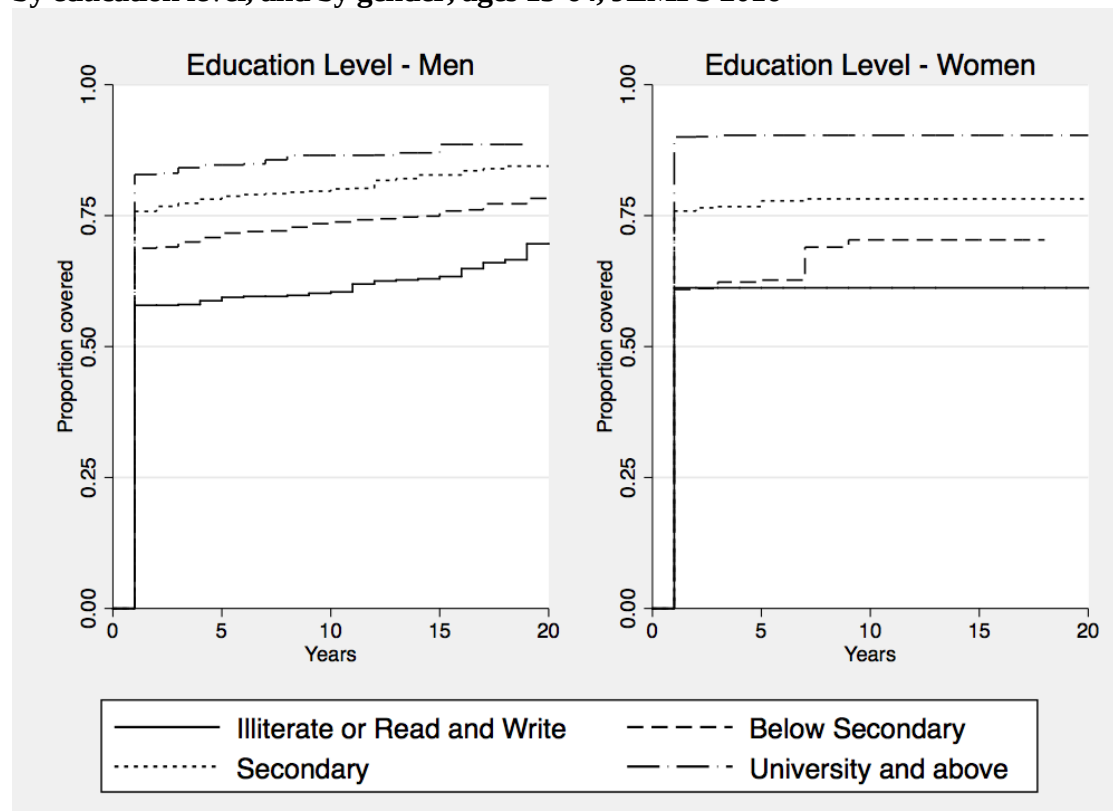
Note: Kaplan-Meier failure curves

Finally, we explore the role that education plays in having access to social security in the Jordanian labor market. As expected, the chances of social insurance coverage increase with the education level, especially for women. Moreover, the lack of social insurance coverage is a persistent state among workers with no education. To show this, Figure 9 shows that among uneducated men, the proportion of workers who become socially insured at the start of their jobs is around 56% and remains below 60% within 10 years of employment. As for men with below secondary and secondary education levels, they face better chances of acquiring social insurance coverage at the start of their job ranging between 69% and 76%, respectively. In 10 years of work, coverage rates reach 74% and 80% for these two groups, respectively. As expected, university graduates are the

most likely to be enrolled in social security upon starting their jobs (around 83%). However, their proportion of coverage does not increase substantially over time, reaching around 87% after 10 years.

The survival analysis for women reveals that the only two education levels that substantially raise the likelihood of coverage are university education (90% upon job start), followed by secondary education (76% upon job start). Below secondary graduates are 61% covered upon the first job start, which is a lower proportion of coverage than their male peers.

Figure 9 Proportion acquiring social insurance coverage by years since start of first job, by education level, and by gender, ages 15-64, JLMPS 2016



Source: Authors' calculations based on JLMPS 2016

Note: Kaplan-Meier failure curves

5. Patterns of Early Retirement

5.1 Changes in Retirement Age

This section examines the evolution of the early retirement trend that was earlier observed in Jordan and the changes in the distribution of the retirement age following the reforms. We used the employment history module in both JLMPS 2010 and JLMPS 2016 to track individuals across their labor market statuses, and to identify their last employment status before retirement as well as the end date of this status.¹⁴ This date of the end of this last employment status is considered as

¹⁴ For JLMPS 2010, we identified retirees as those who either reported being ever retired in their career history, or those who ever worked and were receiving retirement pensions in 2010. For the sample of people who ever retired and explicitly reported retirement as an employment status in their career history, we considered the start date of such a status as the retirement date.

the date of retirement, and accordingly the age of retirement is calculated. We also used complementary information about the receipt of pensions to further validate our sample. The analysis of this section is limited to Jordanian men, because of the sample of Jordanian women who worked and ever retired is not sufficient to draw conclusions. Moreover, we limit the analysis to those who retired after 2003, in order to have a comparable number of years before and after 2010 reforms.

Table 4 shows the average incidence of early retirement among Jordanian men who retired after 2003, which is defined as the share of those retiring below 60 years old in all retirees. We distinguish between workers who retired before 2010 (between 2003 and 2009) and those who retired in or after 2010. Among retirees before 2010, the incidence of early retirement among men (i.e. retiring before 60 years old) was around 89%. It became around 87% (a two percentage point decline) among those retiring after 2010. This slight change in early retirement patterns can probably be associated with the 2010/2014 reforms, which imposed further restrictions on retirement eligibility and higher discounts on pensions. However, the decline in the early retirement trend could have been muted by the process of restructuring occupations and earnings in Jordan's public sector, which took place in 2012, according to the Jordanian Civil Service Bureau (CSB). It seems that such a restructuring resulted in raising the basic wages for the majority of the public sector servants and hence their pensionable income, inducing some to still opt for retirement (Civil Service Bureau (Jordan) 2012; Civil Service Bureau (Jordan) 2013). Moreover, as above mentioned, workers aged 42 to 44 or 45 years old in 2014 were still eligible to retire under the 2001 law. Therefore, the time span available (those retiring between 2010 and 2016) is not yet long enough to capture any reform effects.

Table 4 The percentage of early retirees in all retirees, by whether retirement happened before 2010 (between 2003-2009) or in and after 2010 and by gender, JLMPS 2010 and JLMPS 2016

	Pre-2010 Reform	Post-2010 Reform	Total
Old-age Retirees (60+)	11	13	12
Early Retirees (35-59)	89	87	88
Total	100	100	100
N	699	445	1,144

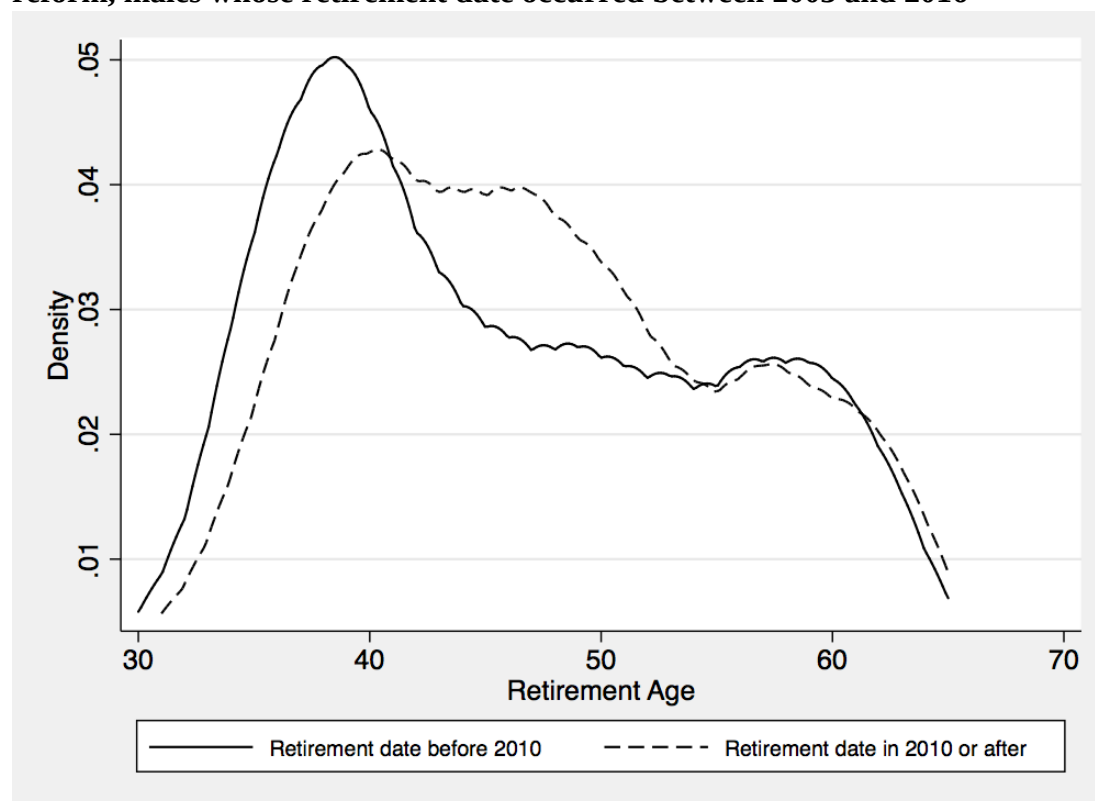
Source: Authors' calculations using JLMPS 2010 and JLMPS 2016.

To examine whether such a slight decline in the early retirement trend masks any change in the retirement age distribution before and after 2010. For this purpose, Figure 10 shows the kernel

As for those who ever worked and were receiving retirement pensions in 2010, without specifying retirement as an explicit status in the employment history, we made further assumptions to identify the date of their retirement. Specifically, for this group, the retirement date is assumed as the start date of any of the following employment statuses, provided that the individual worked for wage before these statuses: disability, being more than 65 years old, becoming employer or self-employed. Moreover, among this group who ever worked and were receiving retirement pensions in 2010, there were wage workers in the public sector and became unemployed or transit to the private sector after their public sector jobs. We suspect that they claimed their retirement when they first became unemployed or worked in the private wage sector, hence their retirement date is assumed as the start date of unemployment or private sector wage work that followed a public sector job.

distribution curves for men's retirement age before and after the reform.¹⁵ Again, for workers retiring before 2010, the sample is limited to those who retired since 2003. The distribution of the retirement age for retirees between 2003 and 2009 seems to be bimodal, around 38 years old and around 60 years old. As for those who retired between 2010 and 2016, the figure shows a shift to the right of the distribution, implying a rise in the average retirement age, and then it steadily declines after 46 years old until again peaking at the mandatory age of retirement (58 years old). Many of those who retired after 2010 claimed their retirement between 40 and 46 years old.

Figure 10 Distribution of retirement ages (kernel densities) pre- and post-social security reform, males whose retirement date occurred between 2003 and 2016



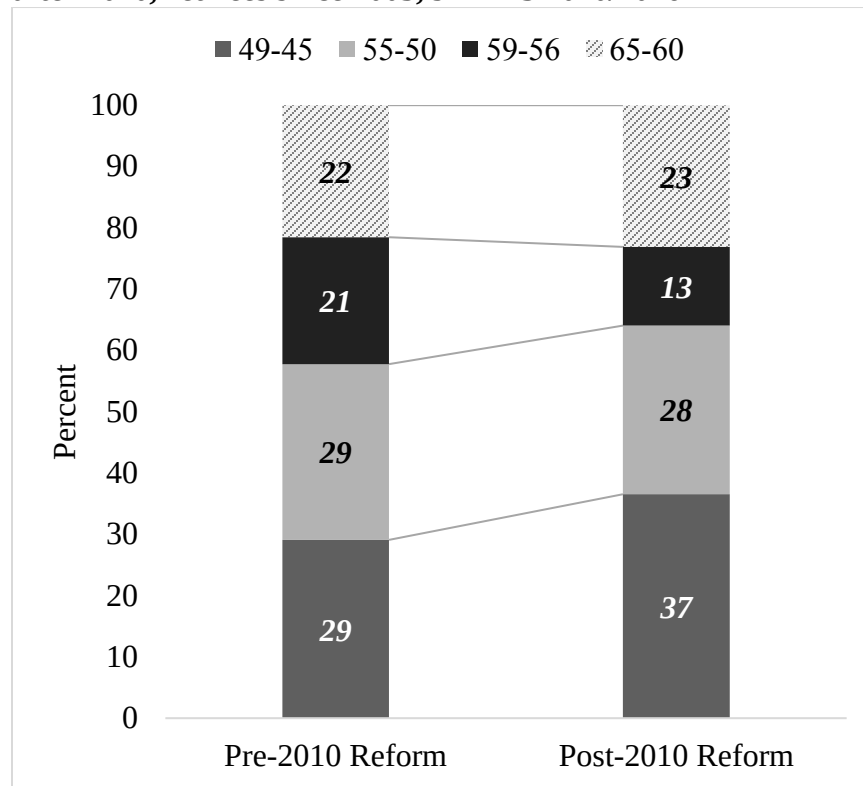
Source: Authors' calculations using JLMPS 2010 and JLMPS 2016.

Such a pattern is further confirmed by the results presented in Figure 11 which shows the distribution of workers according to their retirement age, starting at ages 45 or above, distinguishing between those who retired between 2003 and 2009 and those who retired after 2010. The share of men retiring between 45 and 49 years old increased by around 8 percentage points, from 29% of all retirees between 2003 and 2009 to 37% of all retirees between 2010 and 2016. The share of those who retired between 50 and 55 years old was at 29% and 28% of all retirees in 2010 and 2016, respectively. We observe a lower early retirement incidence between the ages of 56 and 59 among men, with around 8 percentage points (reaching 13% in 2016) and a 1 percentage point increase in the share of those who retired beyond the age of 60 (reaching 23% in 2016). The

¹⁵It is interesting to see that the retirement age starts as young as 30 years old and can extend to 65 years old. Alhawarin(2014) showed that military forces covered by both social security and military retirement laws are much more likely to retire under age 40.

overall pattern of high early retirement rates is in line with the SSC records. For instance, as depicted in Table 5, in 2013, more than two thirds of male retirees (who were covered by the SSC schemes) receive pensions due to various reasons at ages well below the age of old-age retirement (60 years old or above)., in 2013, more than two thirds of male retirees (who were covered by the SSC schemes) receive pensions due to various reasons at ages well below the age of old-age retirement (60 years old or above).

Figure 11 The distribution (percentage) of retirees by retirement age category, by whether retirement occurred before 2010 or after 2010, retirees since 2003, JLMPS 2010/2016



Source: Authors' calculations using JLMPS 2010 and JLMPS 2016

Table 5 The average age and percentage distribution of to-date male pensioners*, by type of pension as at 31/12/2013

Type of Pension	Average Age	Distribution in percent
Old-age	61	33
Early Retirement	50	41
Disability due to Natural Causes	50	13
Disability due to Work injury	36	3
Death due to Natural Causes	47	9
Death due to Work injury	36	2
Average Age /Total	53	100

Source: SSC (2014).

Notes: *This includes only alive pensioners registered in the Social Security Corporation.

Overall, despite this slight decline in the average early retirement rates for Jordanian men, early retirement continues to be one of the main stylized facts of Jordan's labor market. Employees try to withdraw from labor market as soon as the law permits. On the other hand, in an environment of low economic growth and regional instability, as has occurred in Jordan over the last seven years, one would expect higher rates of early retirement driven by private sector employers' desires to decrease production costs. Also, as mentioned above, some other reforms such as the occupation restructuring in the public sector, or raising the contributions rates paid by employers, might have encouraged early retirement. All these factors should be taken into account and may partly explain such a slight decline in the early retirement trend, along with a short time span to fully capture potential long-term changes. The SSC continues to consider early retirement as a serious challenge facing Jordan and the long-term sustainability of the social security system (see SSC's annual reports for the period 2010-2016).

5.2 Do Retirees Reenter the Labor Market?

Social security reform involved new measures allowing retirees to retain part of their pension income if they decide to return to employment, with the aim to promote higher labor force participation rates. Therefore, it is interesting to examine the current labor market status of those who retired between the ages of 45 and 64 during the period 2003 to 2009 using JLMPS 2010, and that of their peers retiring in the same age range during the period 2010 to 2016 using JLMPS 2016. This is done in Table 6 which breaks down retirees, currently aged below 65 who claimed their retirement in the age range 45-64 in 2016 and 2010 according to their current work status into three groups: employed, unemployed and out of labor force.

About 85% of male retirees observed in 2016, who retired between 45 and 64 years old in the period 2010-2016, were out of the labor force whereas 10% were employed and 5% unemployed. In contrast, in 2010, their counterparts who retired during the period 2003-2009 were obviously more likely to return to work, where around 78% were out of the labor force and 22% were employed.

Table 6 The distribution (percentage) of work status of retirees by retirement dates, males ages 45-64, JLMPS 2010 and JLMPS 2016

Work status*	Retirement Date between 2003 and 2009 JLMPS 2010	Retirement Date between 2010 and 2016 JLMPS 2016
Employed	22	10
Unemployed	0	5
Out of L.F	78	85
Total	100	100
N	191	287

Source: Authors' calculations using JLMPS 2010 and JLMPS 2016.

Notes: * Work status during 3-month as a reference period, market definition (search required).

Therefore, labor market opportunities for pension receivers trying to return to employment appear to have narrowed over the last seven years. Two factors may play a role in this evolution. The first is the efforts of SSC in enforcing the law, which entail any firm with at least one employee to register and contribute to social security schemes, leading firms to slow down hiring. This may

have lead more retirees who are not able to secure formal jobs to stay inactive.¹⁶ The second is the low economic growth and the decrease in overall labor demand that Jordan has been experiencing. In general, the economy in Jordan has not been able to generate adequate jobs in terms of quality and quantity over the last few years (Assaad 2014).

6. Conclusion

This paper presents an overview of the social security system in Jordan and the recent reforms applied in 2010 and 2014. The reforms aimed to ensure the financial sustainability of the system, curb the early retirement trend prevalent in the Jordanian labor market in order to boost labor force participation and to lessen financial burdens on the insurance funds, and to extend coverage to vulnerable workers. Moreover, following these reforms, the paper examines the evolution of different aspects of the social security system, such as the incidence of social security coverage, how it evolves over time spent on the labor market, and retirement ages.

Using the two rounds of the Jordanian labor market panel surveys (JLMPS) in 2010 and 2016, we first examined how social insurance coverage changed between 2010 and 2016 for different employment statuses (public sector, private regular wage work, private irregular wage work, employers, and self-employed). Second, we analyzed how long it takes to acquire social insurance coverage, if ever, hence how long it takes to get a formal job in the Jordanian labor market (using survival analysis). Third, we investigated the evolution of the early retirement trend, focusing only on men.

Between 2010 and 2016, access to social insurance coverage has overall increased in from 60% to 63% for all workers, from 57% to 59% among men, and from 75% to 78% among women. Specifically, it increased for some categories of workers such as private sector wage workers, irregular wage workers, and non-wage workers (employers and self-employed), particularly among men. The observed narrowing in the coverage gap among private sector wage workers was primarily in small firms with five to nine workers (for men). Inversely, there was a widening in the coverage gap in bigger firms. Yet, regular wage workers in large private sector firms are, in general, substantially more likely to be covered than those in smaller firms. This trend may be associated with the increase in contribution rates under the new law and the higher ability of bigger firms to avoid compliance and afford fines levied by the authorities. We also notice a rise in social security coverage among employers and self-employed. Both categories of workers were mainly targeted by the social security reforms.

The paper further showed that workers starting in the public sector were the most likely to acquire social insurance coverage at the start of their jobs, followed by the private wage workers inside establishments. Yet, the lack of social security coverage is a relatively persistent state in the private sector if the wage worker could not get it immediately upon getting hired. Interestingly, for both men and women who started their first job after the 2010 reform, during the period 2011-2016, there was a decline in the proportion acquiring social insurance coverage upon their job start. This highlights that new entrants in the Jordanian labor market increasingly work in informal jobs. Education level plays an important role in having access to social security in the Jordanian labor market, where the chances of social insurance coverage increase with education level, especially

¹⁶Under the new law, fines levied by the authorities in case of non-compliance with the regulations were increased substantially (from JD 50 to JD 500 for any unregistered employee). Coupled with the increased efforts of SSC in enforcing the law (see SSC, 2016), the latter may have also contributed to increase compliance and tighten labor market opportunities for early retirees

for women. Moreover, the lack of social insurance coverage is a persistent state among workers with no education.

On the gender front, women are in general more likely than men to have access to social insurance coverage when starting their jobs. This indicates that women are selective in regards to the jobs they accept, with a strong preference for formal jobs.

Concerning early retirement patterns, our findings show that the average incidence of early retirement (share of early retirees in all retirees) among men decreased slightly. However, the change in the distribution of retirement age is still problematic for the long-term sustainability of social security funds. Among men, representing the vast majority of workers in the economy, the share of those retiring between age 40 and 50 increased considerably. In effect, this reduced the share of retirees beyond age 50. Finally, labor force participation rates among middle-aged retirees are still low in 2016.

Even with these new reforms, the social security system still faces a risk of financially unsustainable funds, given the increased longevity of retirees, along with their decreasing labor force participation. More efforts are needed to ensure long-term fiscal sustainability without increasing contribution rates. Recent simulations on Jordan's social security system stipulate the importance of raising the retirement age with slightly decreasing the accrual rates to address the system's long-term insolvency (Bogomolova, n.d.). Moreover, expanding social security coverage requires more diversification of public and private social security schemes (Price et al. 2017).

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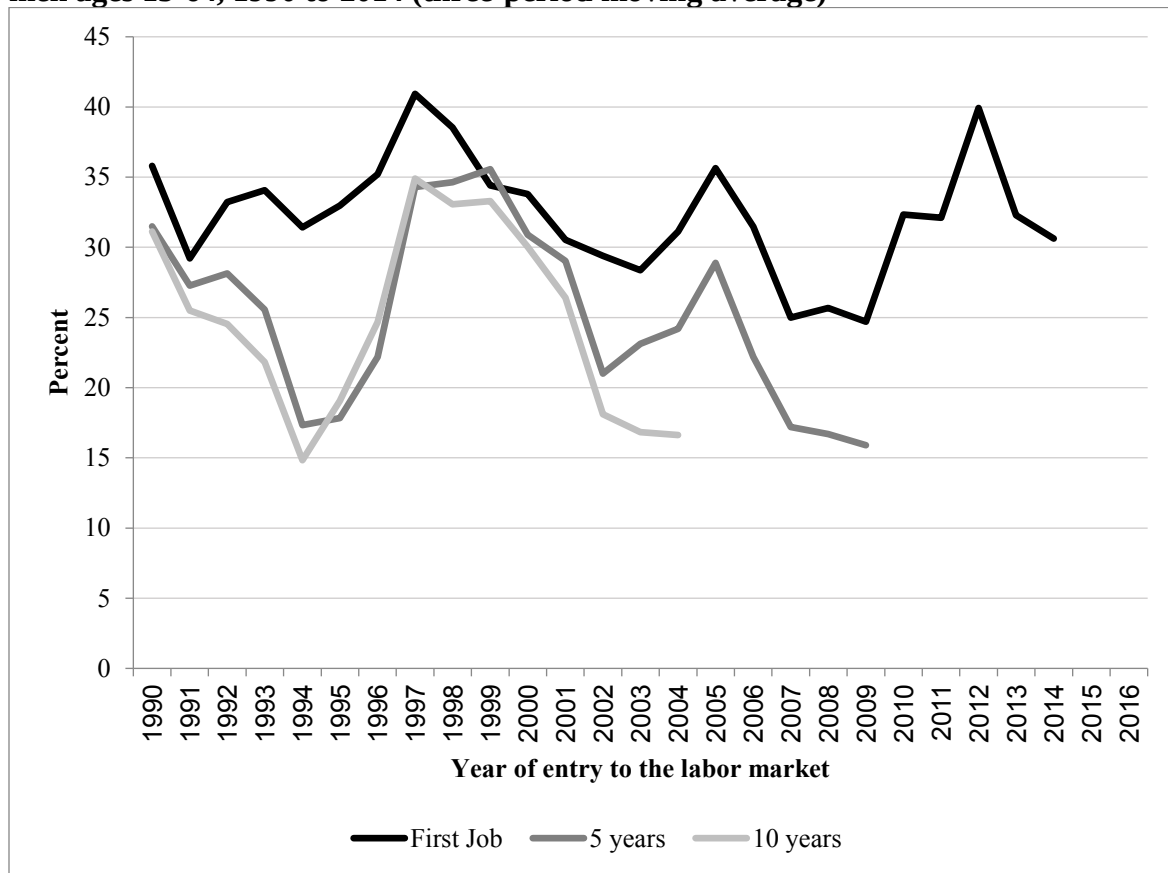
Appendix Table 1 Retirement pensions calculation before and after the reform for a single male worker, by whether age of retirement is at 50 years or at the compulsory retirement age of 60 years, with 25 years in service, for different monthly average wage (AW)

Pension	Pre- reform	Post- reform
Old-Age	Pension = (AW * 2.5%* number of years in service) + (Additional premium) Where the <i>Additional Premium</i> is calculated as 10% of AW, provided being between 30 JD and 50 JD. Examples: 1. If the monthly AW is 300 JD, the old-age pension is calculated as follows: $(300*2.5\%*25) + (30)$, which equals 217.5 JD 2. If the monthly AW is 450 JD, old age pension would be 326.25 JD (i.e. $450*2.5\%*25+30$) 3. If the monthly AW is 1600, old age pension would be 1050 JD (i.e. $1600*2.5\%*25+50$)	Pension = (AW * 2.5%* number of years in service) for AW levels below or equal to 1500 JD + (Amounts greater than 1500 JD *2%*number of years in service) Examples: 1. If the monthly AW is 300 JD in the last 24 months, we assume it to be lower by 1.84% in the last 36 months, to reach 294.5 JD if calculated for the last 36 months (see notes below). The old-age pension is calculated as follows: $(294.48 *2.5\%*25)$, reaching 184.05 JD. 2. If the monthly AW is 1600 in the last 24 months, it would be 1570.56 in the last 36 months. The old-age pension would be 972.78, calculated as follows $(1500*2.5\%*25)+(70.56*2\%*25)$
Early Retirement	Pension = Old age pension - (Benefit reduction* (Old age pension- Overall premium)) Examples: 1. If the monthly AW is 300 JD, the early retirement pension is calculated as follows: $217.5 - (9\%*(217.5-30))$, reaching a level of 200.6 JD. 2. If the monthly AW is 450 JD, the early retirement pension would be 300.9 JD (i.e. $326.25 - (9\%*(326.25-45))$). 3. If the monthly AW is 1600 JD, the early retirement pension would be 960 JD (i.e. $960 - (9\%*(326.25-50))$).	Pension = Old age pension - (Benefit reduction*Old age pension) Examples: 1. If the monthly AW is 300 JD in the last 24 months, we assume it to be lower by 4.25%, to reach 287.25 if calculated for the last 60 months (see notes below). The early retirement age pension is calculated as follows: $(287.25*2.5\%*25)-(11\%*179.53)=159.8$ JD. 2. If the monthly AW is 1600 JD in the last 24 months, it would be 1532 in the last 60 months. The early retirement age pension would be 848.6 (i.e. $1500*2.5\%*25+32*2\%*25 -11\%*953.5$).
Scheme assumptions	• The reference period is the last 24 months. • Accrual rate is fixed at 2.5%. • The pension discount rate for early retirement varies and is 9% if the worker retires at age 50.	• The reference periods of the monthly average wage, used to calculate pensions, increased to 36 months for Old-age and 60 months for early retirement. We therefore expect that the reference AW would decrease, particularly for early retirement, because of inflation. To have an idea about the extent of this decrease, we use the growth of nominal wages for (2009-2014) carried out by DoS.* • Accrual rate varies (Basically 2.5% for $AW \leq 1500$ and 2% for additional amounts). See Table 1 for more details. • Under the new law pension levels have an upper limit, as the reference AW must not exceed a certain amount (JD 3000 in 2014). • Benefit reduction for early retirement increased and is 11% if the worker retires at age 50.

Source: Constructed by the authors based on the calculation method of retirement pensions applied by the SSC.

Notes: * We found that the monthly AW in the last 24 months would be lower by 1.84% and 4.25% if we increased the reference period over which pensions are calculated, to 36 months and 60 months, respectively. (see: http://www.dos.gov.jo/dos_home_e/main/linked-html/employment/index.htm).

Appendix Figure 1 Percentage of private sector regular wage workers in informal micro/small firms by years of experience since first entry to the labor market, Jordanian men ages 15-64, 1990 to 2014 (three-period moving average)



Source: Constructed by the authors using retrospective data of JLMPS 2016