

MATHEMATICAL EQUATIONS FOR CALCULATING ORDINARY OBLIGATORY OLD AGE PENSION PURSUANT TO THE EFFECTIVE JORDANIAN SOCIAL SECURITY LAW

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ABSTRACT: *This paper aims to create mathematical equations for the calculation of age pension. Therefore, it discusses the legal conditions provided by the Jordanian legislator for the entitlement of age pension, which are related to the insured person who reached a specific age for either male or female separately. It illustrates the legal conditions for the insured who did not complete such periods and at the same time reached the age of pension. Further, it examines the legal conditions for the continuous coverage of the insured by the social security after his/her completion of age pension requirements.*

KEYWORDS: Mathematical Equations, Calculation, Old Age Pension, Social Security Law

INTRODUCTION

Old age means that a person reached a specific age by which he/she is not able to do the work ordinarily due to natural physical weakness. Thus, old age insurance is irrelative to purely occupational reasons such as in work injuries and occupational diseases. Rather, it is related to humanitarian and social aspects beside the economic ones. Most social security legislations contributed to enforce pensions for such category and providing them the minimum requirement for their standard of living.

Old age was and still one of the most important risks which threatens the insured individuals. Thus, old age insurance is not considered relating to absolute professional reasons as in work injuries but also it has human, social and economic aspects. Accordingly, most special legislation concerned with social regulation stress that Old age security shall be either through lump sum or through constant regular salary according to each particular country's regulations.ⁱ

In general, Article 2 of the Jordanian Social Security law addressed: "Old Age Pension, Mandatory Old Age Pension, Early retirement pension or work injury death Pension".ⁱⁱ the above definition indicated that Mandatory Old Age Pension is one of the pensions enforced by the law, where it was called "the Mandatory Old Age Pension" or "Long Mandatory Old Age Pension" as it shall enforced by law after the achievement of its required conditions. Such pension shall be allocated upon the insured demand according to particular legal conditions. In addition to the differentiation between such pension and the natural death or work injury death pensions.

The old age pension is the backbone of the benefits of social insurance in Jordan and in any country, representing 75% of the total social security salaries in Jordan.ⁱⁱⁱ

Therefore, this paper will discuss in particular the Mandatory Old Age Pension, while other types of pension shall be discussed separately in other researches.

Conditions for the entitlement of ordinary old age pension

First condition: the insured shall complete the legal age for old age pension

To meet the legal conditions related to the required age for old age pension, there are effective factors to determine such age, namely the documented age proof for Jordanians and non-Jordanians and the differentiation between males and females' age, and this is the topic of our discussion herein.

Factors affecting the determination of legal Age

Age, is considered, under the Social Security Law as provided in para. 1 of Article (62), the basis for the insured's entitlement to the coverage of old age pension, namely the completion of sixty years old for the male, or fifty five years old for the female.

It should be noted that determining the age of retirement is guaranteed by the law to protect the worker, because it prevents the arbitrariness of the employer to terminate the worker under the cause of aging and inability to work. Therefore, the law that determines these considerations by setting standards for such old age.^{iv}

The International Labor Organization (ILO), through the initiatives and recommendations of member states undertakes to develop solutions to the issues or concerns related to aging, provided that Jordan has been a member of the International Labor Organization (ILO) since 1956, and has signed several conventions dealing with various labor issues, including Convention No. 102 concerning Minimum Standards of Social Security, where Article 25 of this Convention states that "every Member State to which this Part of the Convention applies, shall provide for the provision of an old-age subsidy to insured persons". On the other hand, Article 26, para. 2 thereof, states that the age of an entitled person shall not exceed 65 years or older age as might be determined by a competent authority, with paying attention to the elderly's ability to work in a particular country". Thus, it determined the upper limit for old age by 65 years. However, some countries have lowered this age to 60 years for men and 55 years for women, including Jordanian legislators. As we considered this is good, because it is in favor of the worker, also the International Labor Organization set the upper limit that the member countries shall abide and left wide room for members to determine less limit to the old age because it is more beneficial to the insured.

Age Proof

Article 61 of the Jordanian Social Security Law states that "for the purposes of applying the provisions of this law, the age shall be proven by an official birth certificate of the Jordanian insured or by an official document for the non-Jordanian insured adopted by the Corporation in accordance with the regulations issued under the provisions of this law." This means that the Jordanian citizen shall prove his or her age by providing a birth certificate. However, the two researchers, herein, believe that the proof of the age of someone can be provided through the civil ID, passport, family book or military service book, which are all usually issued on the basis of the birth certificate or any other official certificate. Similarly, for the foreigner, he or she can be considered in relation to his age according to what mentioned in his passport or any other official document recognized in Jordan.

Some ask if a person changed his or her date of birth?. For example, if the insured submitted an official birth certificate at the time of his participation and then modified his date of birth

legally. The supporters of this opinion propose the addition of a provision to the legislative text of this article providing that (a proof of age shall be according to official birth certificates provided upon his or her contribution, and any other official document provided after that shall not be accepted). The supporters of this opinion aimed to stability and constancy in terms of the rights of the insured and to prevent fraud against the law.^v

The authors, also, believe herein that despite the evidences of the opinion to control the circumvention of the insured in some cases, but the decision to change the age will not be a judicial decision, which is based on certain data and therefore can not exceed these judicial decisions peremptory change of age through the existence of a text to disrupt these decisions. This is what The Court of Cassation decided in terms of the absence of legal provision that determine the amendment of age, where it decided that "The amendment stipulates that the amendment of the date of birth in the family book was made after the contribution to the Social Security Corp. And this shall make any changes as long as the amendment is the implementation of a court order that corrects the date of birth, and this affect the date of birth from birth, not from the date of the judgement"^{vi}

Thus, according to the Jordanian law, any amendment on the insured age shall be considered if there is a judicial decision thereof.

Gender

The Jordanian legislator has done moral by reducing the age of old age retirement by making the old age for women 55 years and for men 60 years, i.e., less by five years due to the social, physical and humanitarian considerations of women. In terms of social issues, women are more burdensome in terms of delivery and raising her children and family. This might reflect Human rights in the Social Security laws for working women and reflects the development of society's view to women. On the physical side, women weaken in their physical capacity with age increase faster than men. However, there other regulations that did not differentiate between the old age of women and men in the application of old age pension.^{vii}

Second Condition: Contribution Periods required for Old Age pension application

Para (2) of Article (62) of the Jordanian Social Security Law entitles the Insured to be paid the old age pension under certain conditions, including: "The contributions of this insurance shall be at least 180 contributions, out of which (84) actual contributions." This means that the legislator created legal conditions related to the number of contributions required to receive the old age pension namely the 180 contributions, i.e., the contributions period shall be 15 years at least, of which 84 are actual contributions, i.e. 7 years of actual contributions at least. In other words, we mean by the actual contributions the continuous contribution of the insured and it shall not include the added or purchased periods. This means that both conditions must be complied with, as well as the actual periods. It is also deemed an actual contribution the term that the insured has worked for an employer or for his own account (with optional contribution) on an ongoing basis.

Accordingly, the old age pension shall take into account the international standards for calculating the Social Security pensions which take into account the statistical issues and actuary linkage between contributions and benefits on one hand and the joint liability of contributors on the other hand. Therefore, the old age pension shall depend on the number of

years of contributions multiplied by the insured wage multiplied by a ratio under upper limit and lower limit of the pension according to the following equation:

Old Age Pension = Number of years of contribution * the entitled wage or salary * benefit factor ratio.^{viii}

Third Condition: Completion of contribution periods and adding the remaining periods

Completion of contribution periods through the continuation of voluntary addition or joining new job

Article 63 (A) of the Social Security Law states that if the insured has completed 60 years of age for male and 55 years for female, but he or she has not achieved the required number of contributions according to the law of at least 180 contributions. The law grants the insured the right to continue to be covered by the provisions of this law optionally or by joining a new work covered after the completion of the legal age for the retirement of old age for male or female and until the completion of the period of incomplete contributions required and thus be entitled to the benefit of old age pension. The insured shall be, during this period, subject to the social security, where the ratios of the old age shall be sixty for males and fifty-five years for females as shown in Table 6 attached to the Jordanian Social Security Law.

Completion of contribution periods through the continuation in the same job (the same last employer)

Para. (b) of Article 63 of the Social Security Law states that the legal age for old age pension but lacks some of the contributions required by law, and as the insured wanted to continue working in the same establishment or to be used in another work in the same establishment, for the purpose of completing his contributions for the period of entitlement to old retirement pension, the establishment in this case shall continue his or her coverage by the Social Security as well as its obligation to pay the resulted contributions. And he or she shall be covered by the provisions of the Social Security Law, and for this purpose the rates of calculation shall be on the basis of the age of sixty for male and the age of fifty-fifth for female as shown in Table (6) attached to the Jordanian Social Security Law. This table were divided into three columns titled by: age category, the ratio of the first 1500 JDs of the salary average and for the ratios greater than 1500 JDs. Where there are two separated tables, one for males and the other for females.

Completion of contribution periods and adding the remaining periods by purchasing it for the old age pension coverage

Article 65 (a) of the Social Security Law stipulates that: "An insured person who has completed the age of sixty for the male and fifty-fifth years for the female or has continued after that, but did not complete the minimum contributions necessary for the old age pension and has been terminated for any reason he or she may request the addition of the necessary period for purposes of the completion of the period for the entitlement of such pension. This pension shall be entitled for an amount calculated according to the table (3) attached to this law, and on the basis of the last monthly salary or wage subject to the deduction approved by the Corporation." And of course to include the insured by this provision, he or she shall has actual contributions for not less than 48 months.

For the same purpose, para. (b) of the same Article states that "the insured may use the accumulated savings account balance stated in para. (a) of Article (57) of this Law^{ix} (1) for the purposes of payment of the corresponding amount to add the necessary period required for his or her entitlement to complete the due period of the old age pension."

Fifth Condition: The continuity of insured coverage by the Social Security after the completion of his or her age pension conditions

The Jordanian Social Security law permitted, according to Article (63/C), the entitled insured continue be covered by the Social Security, upon his or her request, within six months from the date of completion of the legal periods (60 years for male and 55 years for female). By this, the legislator set a limit for the age of 65 for male and 60 for female for the purpose of increasing the old age pension amount. But this shall be voluntary or upon the approval of the establishment or the employer. In this case, the employer shall notify the Social Security Corporation of such approval. Where such notification shall be within the legal period enforced by the legislator, i.e. six months from the date of the insured entitlement for his or her old age pension. Accordingly, the mandatory old pension shall be calculated according to the ratios shown in table (6) attached to this law. However, according to Article (63/D) of the Social Security law: "The Old age pension entitled insured shall not, in any case, to return to be covered by the provisions of the Social Security Law."

However, there is a question, herein, about the ruling if the insured continues to work after reaching retirement age provided that there are no shortcomings in the contributions?

If the insured reaches the age of retirement and at the same time he or she was up to the legal periods due to the old age pension, the old age pension shall be paid to him or her. However, if he continues to work, in this case he can collect the old age pension and the wage for his work without any limitation and the the new periods of work shall not be calculated in the social security, i.e. he or she shall not pay any contributions and old-age pension shall not increase, but he or she is entitled to end-of-service benefits for the retirement age.^x

The authors, herein, believe that the continuation of the insured to work after the completion of the old age pension conditions, in accordance with the Jordanian Social Security law of two possibilities, the first possibility is to continue work despite the completion of the conditions of retirement age at a maximum age of 65 years, provided that he or she has notified the Social Security corporation during a period of six months of the completion of legal conditions and based on para. C of Article (63) of the Social Security Law. The second possibility is to get an old age pension and continue work, but he or she is not covered by the social insurance for periods beyond retirement age.

Factors for calculating Old age pensions

Wage

Para. (2) of Article (2) of the Jordanian Social Security law stated that: "the cash or in kind benefit paid for the insured for his or her work according to the rules and regulations issued under the provisions of this law".

The Jordanian legislator relied on the Monthly wage of January (the first month of the year) in calculating the annual average wage for monthly contributions. On the other hand, Article (62/b) of the Jordanian Social Security law identified the legal factors for the entitled wage

under this Article, i.e. the monthly wage taken as a basis for the payment of the insured contributions to the Social Security Corporation. This Article added that: “the wage shall be calculated for the last three years (36 months) by dividing the sum of last three years paid contributions on the total number of months (36 months). Or by using any other mathematical equation, through which we can find the daily wage of the insured person during the the last three years before retirement.

Equation (1): Average wage for the last 36 months before old age pension entitlement

Average wage for the last 36 months = (Average monthly wage for the first year + Average monthly wage for the second year + Average monthly wage for the third year) * 12/36

Note: the monthly average wage shall be calculated based on the Social Security law, i.e. the wage of January at the beginning of the year.

$$AMW36 = (AMW1 + AMW2 + AMW3) * 12 / 36$$

The average wage for the last 36 months can be calculated by knowing the total wage rate for a full year. Thus, we collect the total wage for three years (with paid contributions) and then dividing it directly on 36 months, which represent 3 years (there is no need to be multiplied by 12 months because it is annual).

Example (1): An insured person who reached old age on 1/1/2018, and fulfilled the legal conditions for old age pension. If his or her salary subject to the social security contribution as of 1/1/2017 was JD 600, and his or her salary subject to the social security contribution as of 1/1/2016 was JD 550 and his or her salary subject to the social security contribution as of 1/1/2015 was JD 500, what is his or her wage average for the last 36 months?

Solution:

By applying equation (1):

$$AMW36 = (AMW1 + AMW2 + AMW3) * 12 / 36$$

$$\text{Average wage for the last 36 months} = (600 + 550 + 500) * 12 / 36$$

$$\text{Average wage for the last 36 months} = 19800 / 36 = \text{JD } 550 \text{ (Average wage for last 3 years from the date of old age pension entitlement date)}$$

Or by direct solution as follow:

$$(600 + 550 + 500) / 3 \text{ years} = 550 \text{ JD (the Average wage for the last three years of the old age pension)}$$

In the same example, given that the Average wage of a person for the year 2017 was JD7200, and his or her Average wage for the year 2016 was JD6600 and for 2015 was JD6000. Then, the Average wage for the last 36 months shall equal = $(7200 + 6600 + 6000) / 36 = \text{JD}550$.

Contribution period

The contribution periods of the insured person to the Social Security is considered the second factor after the wage. However, there are original actual periods starting by the beginning of his or her service and ending by the termination of service. On the other hand, there are virtual periods that shall not relate to the actual service. Further, there are other periods which the insured is allowed to add it to new ones for specific payment.^{xi}

The required periods according to the Jordanian Social Security law shall be at least 180 contributions, out of which (84) actual contributions.

The Jordanian legislator, however, confined the old age pension entitlement to a specific number of contributions including the required actual contributions. Where this shall prevent fraud by some who joined the Social Security at old age to get benefit of the old age pension after a specific period of time. On the other hand, most of the fund available for the Social Security Corporation come from the employers and workers contributions deducted from their salaries. The Social Security Corporation put special equations to cover such expenditures. Should the law did not determine a specific periods for the contributions, then it shall fault the mathematical statistical process, where the total sum of contributions shall not cover the paid pensions and other expenditures. However, the legislator may intend, by extending the contributions for specific periods, to cover large categories of the society by the social security. In addition, it shall encourage workers to join the social security earlier seeking the old age pension retirement on time or by purchasing the missed contributions.

On the other hand, the contributions period shall depend on the wage, and given that the economic situation in Jordan shall not allow a significant increase in wage, the social security legislations in the successive laws has adopted the increased periods of contributions required for pensions.^{xii}

Restrictions enforced by the legislator in terms of the last 36 months wage average before reaching the old age

The Social Security Law established additional legal restrictions in Article 62 (d), despite the fulfillment of all the basic legal conditions of the insured to entitle the old age pension, such as the required contributions, the actual contribution periods, the required age of a male or a female and many other condition. However, the legislator put restrictions for old age pension by a maximum and a minimum and a minimum for logical considerations for each case. These conditions were enforced due to dramatic increase in wages during the last years of contributions which determine the old age pension because the average wage of the last years contributions shall determine the level of old age pension and shall not consider the insured wages at the beginning of his or her contribution in social security, which called the Jordanian legislator to consider the increase ratios with the average wage of the previous years before the retirement.^{xiii} and this what will be discussed in detail below for each case as follows:

Maximum Wage Average

According to Article (62/D) of the law, for the purpose of calculating the old age pensions, provides for the maximum and minimum limit of monthly wage. In terms of the maximum monthly wage, it shall not exceed in the increase of average as a basis for pension calculation 60% of the insured wage at the beginning of the last 48 contributions (i.e. a sum of 4 years).

Thus, the legislator enforced such restriction to avoid malignancy, so if the increase in the salary for the last three years greater than 60%, the increase shall be excluded under the provisions of this law. Thus, such restriction came in favor of the Social Security Corporation.

Equation (2): Increase Percent permitted under the law

Increase percent in wage under law = Monthly wage for the insured at the beginning of the last 48 months * 60%

$$\text{IPW} = \text{MW48} * 60\%$$

Equation (3): Maximum limit of pension according to the insured wage at the beginning of the last 48 contributions

The maximum limit for the allowed Wage = the Increase percent in wage under law + Monthly wage for the insured at the beginning of the last 48 months

$$\text{MaxW} = \text{IPW} + \text{MW48}$$

Equation (4): Comparison

We compare Equation (1) with Equation (3), and let's take the least value of both, i.e. we compare the average Monthly wage for the last 36 months (AMW36) (Eq1)

with the maximum limit for the allowed age pension (MaxP) (Eq3)

Applications of Equations for calculating the maximum wage average:

In order to find the maximum wage average, we should follow the following steps:

- 1- We find the average Monthly wage for the last 36 months (Eq1)
- 2- We find the insured wage at the beginning of the last 48 contributions (4 years).
- 3- We compare the Average Monthly Wage for the last 36 months (Eq1) with the insured wage at the beginning of the last 48 contributions, then if the first (Average Monthly Wage for the last 36 months) is increased greater than 60%, the pension shall be reduced by 60%.

Example (2): Given the same information mentioned in Example (1) in the above, and if the insured wage on 1/1/2014 (i.e. the beginning of the last 48 contributions or as stated by the law the fourth year before reaching the old age) amounted to JD 450, what is the average wage?

Solution:

- 1- By following the same steps shown in example (1), we find:

Average Monthly Wage for the last 36 months (Eq1)= $(600+550+500)*12/36 = 550$ JD

- 2- Noting that the first wage at the beginning of the last 48 contributions, which is already given by the example data = JD 450. Then we compare : $450 \text{ JD} * 60\% = 270\text{JD}$, which is the maximum increase should be paid (Eq2).

The maximum limit for the wage average allowed according to the law= $450 \text{ JD} + 270 \text{ JD} = 720 \text{ JD}$ (Eq3), Then, compare (Eq1) with (Eq3), and chose the least value.

This means that to compare the average wage for the last 36 months (AMW36) [Eq1] with the maximum limit for the wage average allowed according to the law (MaxW) [Eq3].

Given that the average wage for the last 36 months was (JD550) which is less than (JD720) the maximum limit for the allowed pension, then it did not exceed the maximum limit for the allowed wage or pension, then the insured average wage shall be = JD550.

The Minimum limit for Old age Pension

Article (62/D) of the Social Security law determined, for the purpose of calculating the old age pension the maximum and minimum limit for the old age pension. For the minimum limit of old age pension, the average wage, based on which this old age pension is calculated, should not be less than (20%) than the insured wage at the beginning of the last forty eight contributions (i.e. four years).

The Jordanian legislator established this restriction by determining the minimum limit to protect the insured whose wage could fall during the last 36 months for any reason, and the average wage for the last 36 months shall be compared with his or her wage at the beginning of the last forty eight contributions.

Thus, it increased the paid old age pension by 20% at least compared with the insured wage as of the beginning of the last forty eight contributions. This means that if the insured wage at the beginning of the last forty eight contributions was less by more than 20%, his or her wage shall be deemed where the minimum limit in the decrease become 20% only.

It is also noted that this limit came in favor of the insured, because the decrease in the average wage for the last three years by more than 20% compared with the fourth year before the insured reached the old age pension for any reason, this wage shall not match the paid or deducted contributions thereof, and then his or her pension will be low.

Equation (5): Decrease percent in wage allowed under law

Decrease percent in wage allowed under law = Monthly wage for the insured at the beginning of the last 48 months * 20%

DPW= MW48 * 20%

Equation (6): The Minimum limit for the allowed pension based on the insured wage at the beginning of the last forty eight contributions

Minimum limit for the legal allowed pension = the insured wage at the beginning of the last forty eight contributions - Decrease percent in wage allowed under law (Eq5)

$$\text{MinP} = \text{MW}_{48} - \text{DPW}$$

Equation (7): Comparison

We compare Equation (1) with Equation (6), and take the greatest value.

Which means to compare the average wage for the last 36 months (AMW36) [Eq1] with the Minimum limit for the legal allowed pension (MinP)..[Eq6].

Applications of Equations for the calculation of the minimum limit of old age pension

In order to find the Minimum limit of old age pension, we should follow the following steps:

- 1- Find the average Monthly wage for the last 36 months (Eq1)
- 2- Find the insured wage at the beginning of the last 48 contributions (4 years).
- 3- Find the decrease percentage in the allowed wage under the law according to Eq(5).
- 4- Deduct the 20% percent of the insured wage at at the beginning of the last 48 contributions to identify the allowed wage (minimum limit) at the beginning of the forth year before reaching the old age. (Eq6)
- 5- Compare the Average monthly wage for the last 36 months (Eq1) with the insured wage at the beginning of the last 48 contributions, then we take the greatest value.

Example (3):

Given the same data shown by example (1) and given that the insured wage as of 1/1/2014 (i.e. at the beginning of the forth year, before reaching old age, and according to the law at the beginning of the last forty eight contributions) amounted to JD450, then what is the old age pension?

Solution:

- 1- By following the same steps shown in example (1), we find the Average wage for the last 36 months (Eq1) = $(600+550+500)*12/36 = \text{JD}550$.
- 2- Find the insured wage at the at the beginning of the last forty eight contributions, which is already given by the example's data = JD450.
- 3- Find the decrease in the allowed wage under the law according to Equation (5):

$$\text{DPW} = \text{MW}_{48} * 20\%$$

$$\text{DPW} = \text{JD}450 * 20\% = \text{JD}90$$

4- Reference to equation (6):

Minimum limit for the legal allowed pension = the insured wage at the beginning of the last forty eight contributions - Decrease percent in wage allowed under law (Eq5)

$$\text{MinP} = \text{MW48} - 40 \text{ JD} = 410 \text{ JD.}$$

$$\text{MinP} = 450 \text{ JD} - 90 \text{ JD} = 360 \text{ JD.}$$

5- Compare the Average Monthly Wage for the last 36 months (Eq1) with the insured wage at the beginning of the last 48 contributions, then we take the greatest value.

And compare 550 JD with 360 JD, then we take the highest value. Thus, the average wage which based on the pension shall be calculated is JD550.

Percentages of Old Age pensions

According to para. (B) of Article (62) of the Jordanian Social Security law, the legal percentages adopted for multiplying by the Average Monthly Wage to calculate the old age pension shall be as follow:

Percentages for Salaries up to JD1500

The old age pension for every year of the contribution = (2.5%) * First 1500 JD of the average monthly wage which based on the insured paid the contributions during the last 36 contributions.

Equation (8)

Total Old Age Pension (for average wages up to JD1500) = (2.5%) * average monthly wage during the last 36 contributions. (Eq1) * (Number of contribution years/12)

$$\text{TOAP up to JD1500} = (2.5\%) * \text{AMW36} * (\text{CY}/12)$$

Example (4): An insured who reached old age on 1/1/2018, and fulfilled the legal requirements for the entitlement of the old age pension, however his average wage did not exceed 60% of the (48 months) wage for the last contribution, and did not decrease by 20 % compared with the (48 months) wage contribution. Where his salary which was subject for the Social security deduction as of 1/1/2017 amounted to JD1500, and as of 1/1/2016 amounted to 1250 JD, and as of 1/1/2015 amounted to 1000JD, however his Monthly contributions were 200 months. What is his old age pension?

Solution:

1- From equation (1), we find the average wage for the last 36 months

$$\text{AMW36} = (\text{AMW1} + \text{AMW2} + \text{AMW3}) * 12 / 36$$

$$\text{AMW36} = (1500 \text{ JD} + 1250 \text{ JD} + 1000 \text{ JD}) * 12 / 36$$

$$AMW36 = 1250 \text{ JD}$$

- 2- Given that his average wage is less than 1500 JD, we will use Equation (8) to find the Total Old Age Pension (for the salaries of average wage up to 1500JD)

$$TOAP \text{ up to } 1500 \text{ JD} = (2.5\%) * AMW36 * (CY/12)$$

$$TOAP \text{ up to } 1500 \text{ JD} = (2.5\%) * 1250 \text{ JD} * (200/12)$$

$$TOAP \text{ up to } 1500 \text{ JD} = \text{JD } 521$$

Percentages for Salaries greater than JD1500

Equation (9):

Total Old Age Pension (for average wages greater than JD1500) = (2%) * average monthly wage during the last 36 contributions * (Number of contribution years/12)

$$TOAP \text{ (greater than JD1500)} = (2\%) * AMW36 * (CY/12)$$

Note: if the average monthly wage during the last thirty six contributions greater than JD1500, salaries up to JD1500 shall be calculated according to Equation (8), i.e. at the rate of (2.5%), whereas the sum increase greater than JD1500 shall be calculated according to Equation (9), i.e. at the rate of (2%).

Example (5): An insured who reached old age on 1/1/2018, and fulfilled the legal requirements for the entitlement of the old age pension, however his average wage did not exceed 60% of the (48 months) wage for the last contribution, and did not decrease by 20 % compared with the (48 months) wage contribution. Where his salary which was subject for the Social security deduction as of 1/1/2017 amounted to JD2500, and as of 1/1/2016 amounted to 2000 JD, and as of 1/1/2015 amounted to 1500JD, however his Monthly contributions were 200 months. What is his old age pension?

Solution:

- 1- From equation (1), we find the average wage for the last 36 months

$$AMW36 = (AMW1 + AMW2 + AMW3) * 12 / 36$$

$$AMW36 = (2500 \text{ JD} + 2000 \text{ JD} + 1500 \text{ JD}) * 12 / 36$$

$$AMW36 = 2000 \text{ JD}$$

- 2- We will use Equation (8) to find the Old Age Pension (for the first JD1500)

$$TOAP \text{ up to } 1500 \text{ JD} = (2.5\%) * AMW36 * (CY/12)$$

$$TOAP \text{ up to } 1500 \text{ JD} = (2.5\%) * 1500 \text{ JD} * (200/12)$$

$$TOAP \text{ up to } 1500 \text{ JD} = 625 \text{ JD (for the first 1500 JD)}$$

- 3- We find the pension for the Sum more than 1500 JD, as follow:

$$2000 - 1500 = 500 \text{ JD}$$

Then, we use equation (9) to find the Total Old Age Pension (for the salaries greater than 1500 JD)

$$\text{TOAP for salaries greater than 1500 JD} = (2\%) * \text{AMW36} * (\text{CY}/12)$$

$$\text{TOAP for salaries greater than 1500 JD} = (2\%) * 500 \text{ JD} * (200/12)$$

$$\text{TOAP for salaries greater than 1500 JD} = \text{JD } 167.$$

- 4- To find the Total Old Age Pension, we sum the Old age pension up to JD1500 plus the Old age pension for salaries greater than 1500 JD.

$$\text{Total Old Age Pension} = 625 \text{ JD} + 167 \text{ JD} = 792 \text{ JD}$$

Note: in the above mentioned cases, the Total Old Age Pension shall be raised by 40 JD (according to the law).

Dependency (Support) Increase

Para. (c) of Article (61) of the Jordanian Social Security Law provides for an increase in the old age pension if the pensioner is a breadwinner of 1-3 dependents. As the mentioned Article states that: "Old age pension shall be increased if the insured assumes the support of another person. In accordance with the provisions of this law, conditions related to support and its conditions according to the following ratios and criteria:

- 1- Increase by (12%) for the first dependent, provided that such increase shall not be less than JD10 and shall not exceed JD100.
- 2- Increase by (6%) for the second dependent and an equal increase for the third dependent, provided that such increase shall not be less than JD10 and shall not exceed JD15 for each dependent.

Equation (10):

Dependency increase on the Old Age Pension for the first dependent = (12%) * Old Age Pension

$$\text{DI1} = (12\%) * \text{OAP}$$

Such dependency increase limit shall not be less than 10 JD and shall not exceed 100JD.

Equation (11):

Old Age Pension for one dependent = Dependency Increase (Equation 10) + Old Age Pension

$$\text{OAP (one dependent)} = \text{DI1} + \text{OAP}$$

Example (6)

Given the same information shown in example (5), and if the insured has one dependent, what is his pension?

Solution:

- 1- Reference to example 5, we found that his pension shall equal = JD792
- 2- Dependency increase on the Old Age Pension for the first dependent = $(12\%) * \text{Old Age Pension (equation 10)}$
- 3- $DI1 = (12\%) * OAP = (12\%) * 792 \text{ JD} = \text{JD}95$ (at least 10 JD and less than 100 JD)
 Old Age Pension for one dependent (equation 11)
 $OAP \text{ (for one dependent)} = DI1 + OAP = 95\text{JD} + 792 \text{ JD} = 887 \text{ JD}$

Equation (12):

Dependency increase on the Old Age Pension for the second dependent = $(6\%) * \text{Old Age Pension}$

$DI2 = (6\%) * OAP$

Such dependency increase limits shall not be less than 10 JD and shall not exceed 25 JD.

Equation (13):

Old Age Pension for the second dependent = Dependency Increase (Equation 12) + Old Age Pension

$OAP \text{ (The second dependents)} = DI2 + OAP$

Example (7): Given the same information shown in example (5) and example (6), and if the insured supports two dependents, what is his old age pension?

Solution:

- 1- Reference to example 5, we found that his pension shall equal = JD 792.
- 2- Dependency increase on the Old Age Pension for the second dependent = $(6\%) * \text{Old Age Pension}$
 $DI2 = (6\%) * OAP = (6\%) * 792 \text{ JD} = \text{JD } 47.5$ (at least 10 JD and less than 25 JD),
 thus it shall be amended to 25 JD.
- 3- Old Age Pension with two dependents (Equation 13)
 $OAP \text{ (for Second dependent)} = DI2 + OAP$
 $OAP \text{ (for Second dependent)} = 25 \text{ JD} + 792 \text{ JD} = 817 \text{ JD}$
 $\text{Total old age pension} = DI1 + DI2 + OAP$
 $= 95 + 25 + 792 = 912 \text{ JD.}$

Equation (14):

Dependency increase on the Old Age Pension for the third dependent = (6%) * Old Age Pension

DI3 = (6%) * OAP

Such dependency increase limits shall not be less than 10 JD and shall not exceed 25 JD

Equation (15):

Old Age Pension for three dependents = Dependency Increase (Equation 12) + Old Age Pension

OAP (Three dependents) = DI1 + DI2 + DI3 + OAP

Example (8): Given the same information shown in examples (5), (6) and (7) and if the insured supports three dependents, what is his old age pension?

Solution:

- 1- Reference to example 5, we found that his pension shall equal = JD 792.
- 2- Dependency increase on the Old Age Pension for the second dependent = (6%) * Old Age Pension

$$DI2 = (6\%) * OAP = (6\%) * 792 \text{ JD} = \text{JD } 47.5 \text{ (greater than 25 JD), thus it shall be amended to 25 JD.}$$
- 3- Dependency increase on the Old Age Pension for the third dependent = (6%) * Old Age Pension

$$DI2 = (6\%) * OAP = (6\%) * 792 \text{ JD} = \text{JD } 47.5 \text{ (greater than 25 JD), thus it shall be amended to 25 JD}$$
- 4- Total Old Age Pension with three dependents = Dependency increase (Equation 10) + Dependency increase (Equation 12) + Dependency increase (Equation 13) + Old Age Pension

$$OAP \text{ (for Third dependent)} = DI1 + DI2 + DI3 + OAP$$

$$OAP \text{ (for Third dependent)} = 95 \text{ JD} + 25 \text{ JD} + 25 \text{ JD} + 792 \text{ JD} = 937 \text{ JD}$$

Equation (16):

The above mentioned Total Pension shall be increased by 40JD (According to the provisions of law)

The total pension amount for the above mentioned cases shall be increased by 40 JD (according to the law), pursuant to Para. B of Article (46) of the beneficial insurance Regulation no. 15 of 2015, which provides for the addition of 40 JD to the old age pension

according to the para.s (B, C & D) in Article (62) of the Jordanian Social Security Law for calculating old age pensions. Thus, the calculated pensions shall be increased by 40 JD as a legal for the capability of high prices living.

Calculating Old Age Pensions before the enforcement of the Jordanian Social Security Law No.1 for 2014

Para (e) of Article (62) of the Jordanian Social Security Law specifies the criteria for calculating the pension of the male who completed the 60 years and the female who completed 55 years, provided that the number of their contributions were (180), out of which 60 (actual contributions) at least until the effective date of this law, (i.e. they shall have completed such contributions before the date of 1/3/2014, which is the date of entry into force of this law, as follows:

Term (1) of Article (62) stipulates: "The Old Age pension for each contribution year shall be calculated at the rate of (2.5%) of the average monthly wage which was taken as the basis for paying the insured's contribution during the last 24 months, with a maximum rate shall not exceed (75%) of that average."

However, Item (2) of Article (62) states that: "The old age pension mentioned in item (1) of this para. shall be increased by 10% for the first dependent and by 5% for each of the second and third dependents, provided that the regulations issued under the provisions of this law shall determine the conditions relating to dependency and its conditions".

Term (3) of para. (e) of Article (62) stipulates that: "The Old Age pension mentioned in item (1) of this para. shall be increased by (10%) thereof, provided that such increase shall not be less than (30) JD and shall not exceed (50) JD."

On the other hand, item (3) of para. (e) of Article (62) stipulates that: " When calculating Old Age pension, the increase in average wage based on such pension is calculated shall not exceed (60%) of the insured's wage at the beginning of the last sixty contributions, and the average shall not be less than (20%)".

Due to the limitations of these cases, which all have been dealt with by the Law No. (1) of 2014 before more than three years. We will mention just the existent cases without providing examples and equations, because the existence of such cases prior to the entry into force of Law as of 1/3/2014 is almost limited to achieving the insured conditions of old age pension before this date.

CONCLUSION

In the Social Security Law, the Jordanian legislator creates legal conditions for entitlement to a natural old-age pension, including age, which is the completion of the male insured the age of 60 and the female insured the age of fifty-five. As well, it enforced other conditions for achieving a specific number of contributions (180), out of which (84) Actual contributions. In our research, we explained what is the mechanism to complete such contributions, if the insured reached the old age and did not have sufficient contributions and we provided the legal solutions, either by continuing contribution with the same employer, joining a new job or adding the remaining period by purchasing the missed contributions. We also defined by

mathematical equations the mechanism thereof. In addition, the Jordanian legislator created restrictions for the minimum and maximum limits of pension, Thus, we translated these limits into mathematical equations and practical examples to calculate the old age pension according to Jordanian law, as well as the legal increases created by the Jordanian Social Security law in case the pensioner supports one, two or three dependents, Finally, we discussed the calculation of Old Age Pension prior to the entry into force of the Jordanian Social Security Law No. (1) of 2014, however we did not extend the discussion of this section since the law has come into force on 1/3/2014, i.e. before three years and half. Thus, the discussion was only restricted to mention the provisions of the concerned Articles of the law.

Table of abbreviations

English Term	English symbol
Monthly wage	
Average Monthly wage 36	AMW36
Average monthly wage for the first year before aging	AMW1
Average monthly wage for the second year before aging	AMW2
Average monthly wage for the third year before aging	AMW3
Increase percent in wage under law	IPW
Decrease percent in wage under law	DPW
Monthly wage for the insured at the beginning of the last 48 months	MW48
Total	T
Maximum	M
Old Age Pension	OAP
Allowed	Ad
Decrease	D
Minimum limit for the legal allowed pension	MinP
Maximum limit for the allowed wage	MaxW
Ratio	R
Total Old Age pension (for salaries up to JD 1500)	TOP1500
Total Age pension (for the salaries greater than JD 1500)	TOP >1500
Number of contribution years	CY
Wage average	WA
Dependency increase on the Old Age Pension for the first dependent	DI1

Tables:

- 1- Table no (6) attached to the effective Jordanian Social Security law related to the ratios of calculating old age pensions and Obligatory pension.

- 2- Table no (3) attached to the effective Jordanian Social Security law related to the due amounts for purchasing the service contributions or periods to be calculated in the pension period.

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- ⁱ Hamdan,H.(2009) Social Security and its provisions and applications, Al-Halabi rights publications, p. 663.
- ⁱⁱ Jordanian Social Security Law No. (1) of 2014.
- ⁱⁱⁱ Al-Zoubi,M. (2013), Social Security and Protection of the Elderly, Dar Wael for Publishing, Amman, p. 179.
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- ^v Obeidat M.,(1998), Explanation of Social Security Law, Wa'el Publishing Agency, Amman,, p. 261.
- ^{vi} Decision of the Jordanian Court of Cassation No. (7) issued in case No. (13/86).
- ^{vii} Article (18) of the Egyptian Social Insurance Law No. (135) of 2010, which did not differentiate between the age of old age pension for women and men and made it unified by the age of 65 years.
- ^{viii} Al-Zoubi M., op. cit., p. 180.
- ^{ix} Article 57 (a) of Jordanian Social Security provides that the insured shall be refund the accumulated balance in his savings account consisting of the contributions deducted from his wage and the contributions paid by the establishment plus the investment income realized to the savings account on the invested amounts less all the amounts paid to him And the expenses incurred in the management of this account, which shall be calculated in accordance with the basis established by the Board. "
- ^x Mansour, M. (1996), Social Insurance Law, Al-Ma'rifah Establishment, Alexandria, Egypt, 1996, p. 151
- ^{xi} Kassem, M. Explanation of Social Insurance, University Publications House, Alexandria, Egypt, p.157.
- ^{xii} Master Thesis, Mohamed Abdelhafeez El Manaseer, Old Age Insurance in the Light of the Jordanian Social Security Law, Amman Arab University, 2009, p.112.
- ^{xiii} Al-Zoubi M., op. cit., p. 182-183.