The Impact of Informal Economy in the Pension System, Empirical Analysis. The Albanian Case

Authors: Bernard Dosti, Faculty of Economics, University of Tirana, Albania, bernarddosti@feut.edu.al; Perseta Grabova, Department of Finance, Faculty of Economics, University of Tirana, Albania, persetagrabova@feut.edu.al; Adela Shera, Faculty of Economics, University of Tirana, Albania, adelashera@feut.edu.al; Ledjon Shahini, Faculty of Economics, University of Tirana, Albania, ledjonshahini@feut.edu.al

By using a simple model, it will be analyzed the impact that informality has in the amount of consumption of the workers during their life cycle. This paper deals with the interconnections of underreported earnings, savings and old-age pension. The workers sampled for this analysis have been divided into three groups:

1. Low income employees,
2. Higher income employees who declare all incomes,
3. Employees who underreport their incomes.

In this paper the analysis is based on two pension models: the model that calculates pension in conformity with the incomes and the basic model, whose objective is poverty reduction for the “third age”. The major result is as follows:

Given the fact that the basic pension system favors employees that underreport their incomes and the fact that the impact of informality is greater in the basic system than in the proportional pension system, the application of basic pension system in the Albanian might be problematic.
Keywords: informality, pensions, proportional model, basic model, Albania

Introduction

There are many examples around the world, how different countries have adapted their pension system in conformity with the important changes they are experiencing. However what works well in a country does not necessarily work well in another country? Pension reforms should be in accordance with the economic, political and social characteristics of the country. The issue referring to the appropriate scheme to be implemented in Albania has been the concern of the governments. In such circumstances, when the “Pay-As-You-Go” system is failing every day, the problem of a reform seems as urgent as it is necessary.

Pension systems have been one of the serious issues, which all Albanian governments have been facing. They have been a constant source of criticism from international bodies and are one of the schemes that aggravate the state budget a lot, therefore impeding the development of the Albanian economy (Treichel, 2001)

As a result of a misconception of this scheme since the beginning, the current system has generated high evasion and informality, distorting effects on the labor market and not providing a long term solution for the pensions. The main problem has to do with the amount of contributions and incentives to pay these contributions.

Using a simple model, it will be given an idea about the impact that informality has in the amount of the workers consumption during their life cycle. For this reason two pension models have been analyzed: the model that calculates pension in conformity with the incomes and the basic model, whose objective is poverty reduction for the “third age”. Augusztinovics, (2005) concludes that increasingly social tensions can be reduced by replacing the pension system related to incomes with a basic pension system.

Given that this topic presents a great complexity and at the same time is so current and present in our daily lives, it would be interesting to treat it in order to provide an alternative for solving such a so sharp problem.
Proportional pensions

In recent years, the Hungarian Economists of the Academy of Sciences have conducted a series of empirical studies regarding pension systems, especially in the countries of Central and Eastern Europe. The assumptions used in their model, have a lot in common with the Albanian reality.

According to (Simonovits, 2008), the assumptions of the model are:

- The population is taken unchanged
- The young population is active in the labor market
- Every elder person has retired

Consequently, \( R \) is the number an employee working years and \( S \), the years of an individuals’ retirement. Dependency rate, expressed as the ratio of pension years to those of work, is marked with \( \mu = S / R \). Although, the difference between the contribution rate of employers and employees is clear in the current pension system clear, in this analysis, this difference is not taken into account. The total salary, which represents the total cost of the work, is marked by \( w \). Individual contribution, paid to the pension system, is calculated at the rate \( t \), of the total reported salary. Health insurance contributions and income tax impacts have been left out of the model. To be closer to the Albanian reality, it is assumed that the rate of employed persons who declare their exact income, are not directly related to the pension system. The system is supposed in equilibrium; the revenues of the system are equal to its expenditures.

The scale of the informal economy in Albania is one of the highest in the Central and Eastern Europe countries. The informal economy is assumed at 34 percent according to (Schneider, Buehn, & Montenegro, 2010). For this reason, it is foreseen to classify the employees in three different groups:

1. Low income employees, who are marked with (U)
   
   It is presumed, that employees who do not fully declare their income are part of the second group. For this group, it is made the following subdivision:

   2. Higher income employees who declare all incomes, who are marked with (P)

   3. Higher income employees who underreport their incomes, who are marked with (N)
The frequency of these employees is: f_U, f_P and f_N. These frequencies are positive numbers, the amount of which shall be equal to 1. Considering all the employment as a unit, the number of employees is marked by 1.

In special cases it may occur that one of the frequencies is equal to 0, as it is the case of economies where informality is in very low levels near 0.

In this model, it is assumed that pensioners receive their pensions, in proportion to the income declared, which are marked with *, (t*, is the rate of the contribution to the system). The current income of workers according to salary levels, are: w_P = w_N and w_U. While the benefits from the system during the retirement period, are: b_P* and b_N* = b_U*. Based on the above assumptions, the benefits are commensurate with the income declared; b_P* = β* w_P and b_N* = β* w_U, where β* is the replacement rate of the pension system related to income (proportional). As it is observed, w_U represents the minimum wage and any potential changes will affect the overall level of formal employment. This problem will not be considered, because of the complexity that it presents.

In the following equations are presented: total real income (W_P) and the total income declared (W_U).

\[ W_P = (f_P + f_N)w_P + f_Uw_U \quad \text{and} \quad W_U = f_Pw_P + (f_P + f_U)w_U \]

Since the system is in equilibrium, then, t* W_U = μβ* W_U. Consequently, subsequent connection between the contribution fee (t*) and the replacement ratio is:

\[ β^* : t^* = μβ^* \]

It is assumed that those who declare all the incomes do not save for retirement period, as they believe that the replacement ratio is sufficiently high. In contrast, people who do not report their total incomes, are supposed to save for the retirement, that hidden amounts. In some cases these rates may be even lower than the rate of social security system, which would make them save for their whole lifetime. So the saving rate is marked with σ, which is: 0 < σ < t* and the annual savings are: σ(w_P - w_U). It is assume that the hidden savings during the R years of work are used for consumption ρ(w_P - w_U) during the S retirement years.

For comparative reasons the level of consumption is analyzed during two stages of life (work and pension). This analysis will provide a more complete picture throughout the whole life cycle, of the consumption
during the work period, which is labeled “youth consumption” and the consumption during retirement, which is labeled “elderly consumption”. Based on the above equations, “youth consumption” would be:

\[ c_p^* = (1 - t^*)w_p \; ; \quad c_N^* = (1 - t^*)w_U + (1 - \sigma)(w_P - w_U) \; ; \quad c_U^* = (1 - t^*)w_U \]

While the “elderly consumption” would be

\[ d_P^* = b_P^* \; ; \quad d_N^* = b_U^* + \rho(w_P - w_U) \; ; \quad d_U^* = b_U^* \]

**Basic pension system**

Some researchers (Augusztinovics & Köllő, 2008), (Kollo, 2008), (Kertesi G., Bonn 2003) consider the replacement of the proportional pension system with a basic pension system as a way to reduce the increasing social tensions. Since the goal of this system is the reduction of poverty during the “third age”, it is assumed that it is given a definite benefit \( b_0 \) which is funded by a consumption tax rate \( \hat{i} \). Each individual pays his/her taxes proportionally after spending money for consumption and for mathematical simplicity it is assumed that the basic benefits are net. Pensions obtained from this system are:

\[ b_p = \beta w_p + \frac{b_0}{1 - \hat{i}} \text{ dhe } b_N = b_U = \beta w_U + \frac{b_0}{1 - \hat{i}} \]

One of the innovations that this model offers is the assumption which does not take into account the possibility of consumption tax evasion, in contrast to the case of non-payment of pension contributions. The implementation of this model faces with some difficulties in our country, such as problems with the informal economy (tax evasion) and the indirectly calculation method of VAT.

In the model analyzed there is no total savings and total consumption is equal to total income. Based on the equation that shows the dependency ratio, the tax equation is as follows:

\[ \mu b_0 = \hat{i}W_P \]

The decreasing contributions, \( tw \) finance only the reduced pensions of employees.

\[ \hat{\beta}w: \hat{t}W_U = \mu \hat{\beta}W_U \; , \; \text{pra } \hat{t} = \mu \hat{\beta} \]
For comparative reasons, it is assumed that the total costs of pensions are invariable. This assumption is clearly expressed in the following equation:

\[ \hat{\iota}W_U + \hat{\iota}W_p = \tau^*W_U \]

By substituting \( \hat{\iota} \) from the previous equation to the new equation the following formula is obtained:

\[ \hat{\iota}W_U + \mu b_0 = \tau^*W_U \]

Consequently, the reduced contributions will be as follows:

\[ \hat{\iota} = \tau^* - \frac{\mu b_0}{W_U} \]

In order for the contribution to be a positive rate, it should be assumed that: \( \mu b_0 \leq \tau^*W_U \). So, \( b_0 \leq \tau^*W_U / \mu \)

The “youth consumption” is:

\[ \hat{c}_p = (1 - \iota)(1 - \hat{\iota})w_p; \quad \hat{c}_N = (1 - \iota)(1 - \hat{\iota})w_U + (1 - \sigma)(w_p - w_U); \]

\[ \hat{c}_U = (1 - \iota)(1 - \hat{\iota})w_U \]

While the “elderly consumption” is:

\[ \hat{d}_p = (1 - \iota)\hat{b}_p; \quad \hat{d}_N = (1 - \iota)[\hat{b}_p + \rho(w_p - w_U)]; \quad \hat{d}_U = (1 - \iota)\hat{b}_U \]

As it can be noticed from the above equations, consumption and benefits of employees who declare all their incomes has decreased, while consumption and benefit of employees with low incomes and workers that underreport their incomes have increased in comparison with the proportional pension system.

### The Albanian Case

For study reasons it is worth presenting a numerical simulation. In the above mentioned models are used features of Albanian pension system.

Based on the Albanian legislation for social security, the working years that an employee must have to obtain a retirement pension, are 35. Consequently, \( R = 35 \text{ years} \). According to official data from the World Bank (2012), the average of life expectancy for the Albanian population is 77 years. By subtracting from this age the average age of the entry into the labor
market, which is 22 years (qualified employees, as well as unqualified have been considered as), it is concluded that the average number of years spent in retirement for every Albanian, is \( S = 20 \) years. Dependency rate, which represents the ratio of average years spent in retirement, with the average years spent in work, is \( \mu = \frac{S}{R} = \frac{20}{35} = 0.57 \).

The calculation of incomes is attained based on the data on employment and average salary for each sector of the economy. It is assumed that:

- All employees of public and private sector and non-agricultural privat sector are classified as employees with high average incomes.
- For purposes of analysis, the informal economy is assumed at 34 percent according to (Schneider, Buehn, & Montenegro, 2010). So, 34 percent of private sector employees do not declare their real incomes.
- Employees of the agricultural sector are assumed as employees with low income.

Based on the above assumptions and on the (INSTAT, 2014) data the distribution of workers by sector is:

\[
f_U = 0.49 \quad , \quad f_P = 0.39 \quad , \quad f_N = 0.12
\]

According to INSTAT data (2013), the average salary in the public sector is \( 52,150 \) ALL (Albanian lek), the average of high salary in the private sector is \( 97,000 \) ALL and in the agriculture sector it is assumed that the salary is equal to the minimum wage \( 22,000 \) ALL. Based on these data, the income distribution is:

\[
w_P = 4.4 \quad dhe \quad w_U = 1
\]

While the average stated salary is:

\[
W_U = 2.326
\]

So, the average salary declared, based on the above analysis, is: \( 2.326 \times 22'000 = 51'172 \) ALL. This indicator has a outcome close to the average salary of \( 52'150 \) ALL declared in Albania.

It is assumed that the amount of benefit in the basic system is equal to half of the benefit of the pension system related directly to income.

\[
b_o = \frac{tW_U}{2\mu}
\]
Also, it is assumed that the worker that does not declare his/her real income, saves half of the money, \( \sigma = t/2 \), which, Social Security, would make the employee save from the income that are not declared.

**Table 1: The Key Indicators**

<table>
<thead>
<tr>
<th>Indicators</th>
<th>Division of employees according to declaration of incomes</th>
<th>The saving rate</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>( f_P )</td>
<td>( f_N )</td>
</tr>
<tr>
<td>Basic Model</td>
<td>0.39</td>
<td>0.12</td>
</tr>
<tr>
<td>Full Reporting</td>
<td>0.51</td>
<td>0</td>
</tr>
</tbody>
</table>

Source: Author Calculations

**Basic Model**

The distribution as per basic assumption is:

\[
f_P = 0.39, \quad f_N = 0.12, \quad f_U = 0.49
\]

In the table below have been presented the characteristics of both pension systems that are being analyzed

**Tabel 2: Characteristics of pension systems**

<table>
<thead>
<tr>
<th>Systems</th>
<th>Contribution Rate ( T )</th>
<th>Tax Rate ( \hat{i} )</th>
<th>Replacement Rate ( \beta )</th>
</tr>
</thead>
<tbody>
<tr>
<td>Proportional pensions</td>
<td>0.216</td>
<td>0</td>
<td>0.38</td>
</tr>
<tr>
<td>Basic pensions</td>
<td>0.108</td>
<td>0.092</td>
<td>0.189</td>
</tr>
</tbody>
</table>

Source: Author Calculations

The above characteristics are calculated in the case of Albania, where the contribution rate paid to the social security, is **21.6 percent** for the proportional pension system. As it can be observed from the above data, when moving from a proportional pension system to the basic pension system, the contribution rate paid to the pension system is halved. A consumption tax at the rate of **9.2 percent** is added to the basic pension system in contrast to the proportional pension system. Refering to the calculations, there is a significant difference regarding the replacement ratio
between the two pension systems. In the proportional pension system the value of this ratio is 38 percent, which is reduced to 18.9 percent in the basic pension system.

We see the impact of two pension systems to the amount of consumption for the three groups taken into consideration.

**Table 3: Consumption amount**

<table>
<thead>
<tr>
<th>Systems</th>
<th>“youth consumption”</th>
<th>“elderly consumption”</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>c_P</td>
<td>c_N</td>
</tr>
<tr>
<td>Proportional pensions</td>
<td>3.449</td>
<td>3.817</td>
</tr>
<tr>
<td>Basic pensions</td>
<td>3.564</td>
<td>3.843</td>
</tr>
</tbody>
</table>

Source: Author Calculations

By analyzing the above results, it can be observed that:

- The “youth consumption” is the highest in three groups on the basic pension system compared with the proportional pension system.
- As expected, the “elderly consumption” with low income at basic pension system is higher than the consumption of the other system. Characteristic of the basic pension system is the support for people with low incomes.
- The “elderly consumption” with high incomes at the proportional pension system compared with the consumption at the basic pension system is about 50 percent higher.
- A weakness in the basic pension system is that it favors the group of pensioners who underreport their incomes.

**Full reporting of incomes**

The analysis of the “ideal case” where all employees report all their income, although it seems utopian, it is worthwhile analyzing.

Division of employees according to the declaration is:
\[ f_P = 0.51; \ f_N = 0; \ f_U = 0.49 \]

**Table 4:** Characteristics of pension systems

<table>
<thead>
<tr>
<th>Systems</th>
<th>Contribution Rate ( t )</th>
<th>Tax rate ( \hat{t} )</th>
<th>Replacement Rate ( \beta )</th>
</tr>
</thead>
<tbody>
<tr>
<td>Proportional pensions</td>
<td>0.216</td>
<td>0</td>
<td>0.38</td>
</tr>
<tr>
<td>Basic pensions</td>
<td>0.107</td>
<td>0.11</td>
<td>0.19</td>
</tr>
</tbody>
</table>

Source: Author Calculations

The rate of contribution to the proportional pension system is 21.6 per cent, as it was in the case of the basic model. As observed from the above table, the characteristics of the basic pension system, has changed in the “ideal case” compared to the basic model. The rate of contribution in the “ideal case” decreased at 10.7 percent compared with 10.8 percent in the basic model. While the tax rate has increased to 11 percent from 9.2 percent in the basic model. Changes in the ratio of replacement are negligible.

We see the impact that the two pension systems have to the consumption quantity of the three groups who have been analyzed.

**Table 5:** Consumption amount

<table>
<thead>
<tr>
<th>Systems</th>
<th>“youth consumption”</th>
<th>“elderly consumption”</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>( c_P ) ( c_N )</td>
<td>( c_U ) ( d_P ) ( d_N ) ( d_U )</td>
</tr>
<tr>
<td>Proportional pensions</td>
<td>3.449</td>
<td>0.784 1.672 - 0.380</td>
</tr>
<tr>
<td>Basic pensions</td>
<td>3.497</td>
<td>0.795 1.264 - 0.689</td>
</tr>
</tbody>
</table>

Source: Author Calculations

By analyzing the results above, we can say that:

- The “youth consumption” and the “elderly consumption” have not changed for the proportional pension system for both cases.
• Into the basic pension system there is a reduction in the consumption quantity at the young age and a very small increase in the consumption during the “third age”.
• So, the basic pension system is more sensitive toward informal economy than the other pension system that is taken into consideration.

Conclusions

The elementary model has already been analyzed. Finally, by analyzing the cases discussed above, it can be concluded that:
• The consumption and benefits of employees who report all their incomes has decreased in the basic pension system compared to the proportional pensions system.
• The consumption and benefits of employees with low incomes and those of the employees who underreport their incomes increased in the basic pension system compared to the proportional pensions system.
• The basic pension system favors employees that underreport their incomes.
• The impact of informality is greater in the basic pension system than in the proportional pension system.
• So, in the Albanian reality the application of basic pension system might be problematic.

References


[7]. Kertesi G., K. J. (Bonn 2003). Fighting low equilibrium by doubling 
the minimum wage? Hungary’s experiment. IZA Discussion Paper 
No.970, Institute for the Study of Labo.

Institute of Economics.

Economies All over the World. The World Bank, Development 
Research Group, Poverty and Inequality Team.

An Elementary Mode. INSTITUTE OF ECONOMICS, HUNGARIAN 
ACADEMY OF SCIENCES.

the Albanian Pension Fund. IMF Working Paper.