

# A Simple Model Referring Evasion Case in Albanian Pension System

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## ABSTRACT

*This study deals with the relationship between underreported earnings, savings and old-age pension. The presented model is taken from the paper “Underreported Earnings and Old-Age Pension System: An Elementary System” of Hungarian Academy of Science and is applied to the Albanian data. Three pension systems have been compared: 1- the proportional, 2- the proportional plus basic pension and, 3- the proportional with means testing. The workers are grouped such as, a- well-paid who report their full earnings (so-called the evaders), b- well-paid who report only the minimum earnings and c- the poorly paid. It is assumed that the evaders have a hidden part of earnings for their old-age. The main result of the study is the following: if the evaders can be recognized and excluded, then the best system is the means-tested one.*

**JEL Codes:** H55, D91

## KEYWORDS

*Reporting Earnings, Proportional Pension, Basic Pension, Means-tested Pension*

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## Introduction

As far as global economy is considered, the pension system is found to be one of the most discussed systems as the main pillar of the life-long expenditure distribution. Ex-communist countries, such as Albania, are often found face to face with the immediate need of reforms in such systems. Developing countries have difficulties in choosing the appropriate pension system because of a large gamma of variable that can be used in the model, different characteristics countries and the lack of a fix “receipt”. Meanwhile, the experience of the developed countries have to be considered important.

The aim of this paper is to develop a model of pension system by using the Albanian official Statistical Data and considering general knowledge about this market.

There exist two pure forms of mandatory pension systems: the proportional, which reflects the life-long contributions, and the basic benefit, which relies in fixed quote (defined benefit). Proportional pension system transforms the workers' savings into pensions proportionally to their earnings, while the flat benefit, is paid independently to the earnings. At the same time there can exist a lot of combinations between these two extrem systems (Disney, 2004). For example, the British system provides a flat benefit for each individual, whereas additional pensions are taken into consideration in the mean-testing. Another example can be the case of Hungarian pension system, a combination of proportional and basic system (Augusztnovics and Martos, 1996)

This study is based on the study made by the Institute of Economics, Hungarian Academy of Science (2008). The Hungarian system is a combination of both systems, the proportional and the basic one. The third system we deal with is that of means-tested, which take into consideration additional pensions.

There exist a debate to remove the fixed component, which favorize the poorly-paid workes with short contrats. The debates pushed toward proposals such as the immediate need of a new system combining the fixed component and the proportional one. This study presents the means-tested system which has lower costs and increases the low pensions only.

The level of the informal economy in the region countries and especially in Albania, is widely studied but often without coming to a consolidate conclusion. However, this phenomenon prompted the Albanian government in 2006 and 2007 to un-

dertake a more comprehensive survey conducted in the labor market. The aim was to minimize the underreporting of private sector wages. The Council of Ministers, in 4<sup>th</sup> of May, 2007 determined the monthly reference salary to be used for the calculation of social security contributions and health, and personal income tax, according to the nomenclature of economic activity (for employees in the non-public performing unskilled jobs).

Self-employed workforce in the agricultural sector is considered poorly-paid (the minimum legal quota). While those who claim less income than they earn, are the people who ignore the old-age pension and thus save some of the hidden income for the period of retirement.

## Literature Review

There exist two main forms of mandatory systems. The first one is known to be the German system. In this system, a benefit proportional to lifetime contributions which provides a generous relative pension for everybody but requires quite high mandatory contribution rate. The second one is known to be the original British system. In this system, a universal flat pension which alleviates old-age poverty with modest mandatory contribution rate but requires complementary benefits. Another type of pension system can be considered the means-tested system. The fixed quota is conditional and if the proportional benefit is lower than the minimum value, then the benefit is topped up to the minimum. Friedman and Cohen (1972) have dialed with the comparison of a universal flat pension and the means-tested and have suggested the reduction of the welfare program size by replacing the former by the latter.

According to Feldstein (1987), the fact that the optimal choice between a means-tested program and a universal program depends on the character of the working population has an important general implication for the design of social security programs. It implies that, if the working population can be subdivided into groups that differ in the relevant parameters, it may be optimal to have a means-tested program for some groups and a universal program for others. He found that welfare is higher in the optimal means-tested system compared to the universal one. In his model he neglected wage heterogeneity and labor supply flexibility. As a consequence the flat plus benefit reduces to a flat benefit and the means-tested benefit is

zero for the life-cyclers. The study of Augusztinovics (2005) has shown that there will be considerable differences among cohorts in the wage level and also a large part of the cohorts retiring in the next decades will have quite low pensions. A later study of Augusztinovics and Kőllő (2008) demonstrated the occurrence of differences through the cohort. As a solution of poverty these studies have suggested: 1- a significant scaling down of the present proportional benefits and contribution rate and 2- introducing a universal flat benefit, to be financed from new taxes.

Barr and Diamond (2008) following the analysis of Varian (1980) have strongly emphasized the insurance provided by the progressive pension system when the future earnings are uncertain at the start. The insurance function of the pension system has been neglected here. They studied the Chile's means-tested pension system where they founded that the lower-paid savings would increase, whereas the others savings would have a decrease. But the overall situation would slightly improve. In another study, Fehr and Habermann (2008) have founded that their optimum is a strong progressive system. They computed a general equilibrium model by taking into consideration the individual risk of career paths and life spans. They used the concept of a socially optimal "progressive pension arrangement" by determining the key parameters. The means-tested was excluded from their analysis.

## Models of pension systems

### *Proportional Pensions*

In this study the model of Hungarian Academy of Science is used and applied for the Albanian case. The population number is taken unchanged, making the assumption that each young is active in the labor market and each old person is in retirement. R is the symbol of working years for a normal worker and S, the years spent in pension. Dependency ratio defined as the rapport between the pension years and the working years is  $\mu = S/R$ . The "wage" presents the total wage cost, which is used as total wage and denoted by  $w$ . Contribution of each individual in the pension fond is forecasted to be equal to the rate  $\tau$  of total reported wage. Fiscal effects have been eliminated. Another assumption in the model is that the reporting or not of the exact income will not be directly related to the pension system applied in the country. Lastly, the system is taken in equilibrium, the incomes equals the expenses.

The rate of informal economy is found to be the largest in Albania compared to the other countries in the region (approximately 50% of GDP). This is the main reason of categorizing the workers in three different types:

- 1) Poorly-paid workers (denoted L)
- 2) Middle or highly-paid workers categorized according to their reporting status:
  - The workers reporting all their incomes (R)
  - The workers unreporting their incomes (U).

The frequency per each type of worker is as follows:  $f_R$ ,  $f_U$  and  $f_L$ , being all positives and having a sum of 1. In some special case of developed economies where fiscal evasion is pretty nothing, one of these frequencies can be equal to 0. Considering the total work force as a unit, the worker number is stated to be equal to 1.

In the attempt to proximate the aim of the actual albanian system, ( by focusing on the undertaken reforms), it is supposed that in the basic system the individuals receive what they report, which is denoted by \*.  $\tau^*$  represents the contribution rate in this system. The actual earnings of the workers are:  $w_R = w_U$  and  $w_L$ , while their benefits are:  $b^*_R$  and  $b^*_U = b^*_L$ . Based on the above assumptions, the benefits are proportional to the reported earnings;  $b^*_R = \beta^* w_R$  and  $b^*_U = \beta^* w_L$ , where  $\beta^*$  is the replacement rate in the proportional system. Some important details such as the case of  $w_L$  to be legally the minimum wage when there is no actual and fictitious partial employment will be simplyfied in this model. (Kertesi and Kollo, 2003 and Tonin, 2005).

The total reported earnings are denoted by ( $W_L$ ), and the actual ones are ( $W_L$ ), which are equal to:

$$W_L = f_R w_R + (f_U + f_L) w_L \quad \text{and} \quad W_R = (f_R + f_U) w_R + f_L w_L$$

Since the system is supposed to be in equilibrium, then,  $\tau^* W_L = \mu \beta^* W_L$ . So the relation between the contribution rate,  $\tau^*$  and the replacement rate is  $\beta^* : \tau^* = \mu \beta^*$

Given that the replacement rates are higher, it is assumed that those who report all their earnings will not save money to consume in the future. However, the evaders will save proportionally to what they do not report in order to consume in the old-age. Saving rate is supposed to be:  $0 < \sigma < \tau^*$ , and annual savings:  $\sigma(w_R - w_L)$ . The efficiency ratio is:  $\rho R / \sigma S$  which can be equal to, smaller or greater than 1.

The comparison between “Young-Age Consumption” and “Old-Age Consumption” is used to have the full picture of the whole life cycle consumption.

Young-age consumption is:

$$c^*_R = (1 - \tau^*)w_R; \quad c^*_U = (1 - \tau^*)w_L + (1 - \sigma)(w_R - w_L); \quad c^*_L = (1 - \tau^*)w_L$$

Old-age consumption is:

$$d^*_R = b^*_R; \quad d^*_U = b^*_L + \rho(w_R - w_L); \quad d^*_L = b^*_L$$

In the proportional system, the actual or reported low earning ensure a low pension and a low consumption in the old-age.

## Basic Pension System

In this system, the contribution rate is supposed to be given as:  $b_0$  which is financed from a consumption tax rate  $\hat{\iota}$ . Each individual will pay his/her proportional tax after each consumption. This kind of reform, the scaling-down of the proportional system and a simultaneous introduction of a basic pension, has been inspired by the work done of several authors (Augusztinovics, 2005; Barabas, 2006). The gross pensions are as follows:

$$\hat{b}_R = \hat{\beta}w_R + \frac{b_0}{1 - \hat{\iota}} \quad \text{and} \quad \hat{b}_U = \hat{b}_L = \hat{\beta}w_L + \frac{b_0}{1 - \hat{\iota}}$$

Different from the pension contribution, the payment of the consumption taxes are assumed to be unavoidable. However, this kind of system can be difficult to be applied in Albania. The lack of box offices, the problem of tax evasion, indirectly VAT calculation method, (all included in the informal economy), are some of the problematic issues making the application of this system difficult.

No saving is assumed to be present in the basic pension system. Total consumption is equal to total production, being equal to total incomes too. Since  $\mu$  pensioners correspond to 1 worker, the tax equation is as follows:

$$\mu b_0 = \hat{\iota}W_R$$

The down-scaled contribution  $\tau w$  finance only the reduced labor pension  $\hat{\beta}w$ :  $\hat{\iota}W_L = \mu\hat{\beta}W_L$ , so  $\hat{\iota} = \mu\hat{\beta}$ .

The equation below emphasizes the assumption that all total expenses are unchanged.

$$\hat{\tau}W_L + \hat{t}W_R = \tau^*W_L$$

By replacing  $\hat{t}$  from old equation to the new one then,

$$\hat{\tau}W_L + \mu b_0 = \tau^*W_L$$

The reduced contribution can be determined as follows:

$$\hat{\tau} = \tau^* - \frac{\mu b_0}{W_L}$$

It is supposed that  $\mu b_0 \leq \tau^* W_L$  in order to have positive contribution so,  $b_0 \leq \tau^* W_L / \mu$ .

Young consumption is:

$$\begin{aligned}\hat{c}_R &= (1 - \hat{i})(1 - \hat{\tau})w_R; \quad \hat{c}_U = (1 - \hat{i})(1 - \hat{\tau})w_L + (1 - \sigma)(w_R - w_L); \\ \hat{c}_L &= (1 - \hat{i})(1 - \hat{\tau})w_L\end{aligned}$$

Old consumption is:

$$\hat{d}_R = (1 - \hat{i})\hat{b}_R; \quad \hat{d}_U = (1 - \hat{i})[\hat{b}_L + \rho(w_R - w_L)]; \quad \hat{d}_L = (1 - \hat{i})\hat{b}_L$$

Benefits and consumption of workers who report lower incomes / or actually have low incomes, have increased significantly compared to the proportional system. The benefits of type R have been reduced.

## Means-tested Pension System

This is the last type of the pension systems analysed in this paper. The two previous systems can have some evident problems. For example, in the basic system, the workers reporting their full earnings, (R), will benefit less than those in the proportional system. Those who do not fully report their earnings, (U), will benefit more than the part they do not report. The third system, means-tested, will try to enhance the problematic issues faced in the presented systems. In this case the government can distinguish the needy person (L) and the evader (U).

Now there are three types of benefits:  $\bar{b}_R = \bar{\beta}w_R$ ;  $\bar{b}_U = \bar{\beta}w_U$  and  $\bar{b}_L = \hat{b}_L$  where  $\hat{b}_L = \bar{\beta}w_L$ . In this model the benefits of needy persons are the only ones to be financed by the taxes:  $\mu f_L(\hat{b}_L - \bar{\beta}w_L) = \bar{i}W_R$

Contributes  $\bar{w}$  are financed from the proportional component  $\bar{\beta}w$ :  $\bar{\tau} = \mu\bar{\beta}$ . By using the last equation then,

$$\begin{aligned}\bar{\tau}W_L + \bar{i}W_R &= \tau^*W_L \\ \bar{\tau}W_U + \mu f_L \hat{b}_L - f_L \bar{\tau}w_L &= \tau^*W_L\end{aligned}$$

The contribution rate in the model of means-tested is:

$$\bar{\tau} = \frac{\tau^*W_L - f_L \mu \hat{b}_L}{W_L - f_L w_L}$$

It is supposed that  $\tau^*W_L \geq f_L \mu \hat{b}_L$  in order to have a positive contribution rate. The only difference between the means-tested system and proportional one is the exclusion of the evaders. By excluding the evaders, the needy pension increases and the pension of highly-paid persons decreases, without making the distinction between fully reported or not.

## Albanian Case

### *Data specification and determination*

Based on the statistical data of average mean for the Albanian population working average years before retiring are  $R = 35$ . Subtracting the working average years from average living years, which is found to be 74 years for the Albanians, and supposing that the average years of entering to labor market is 20 (taking into account both qualified and unqualified workers), it is calculated that the average time spent in retirement is 20 years, denoted by  $S$ . The dependency ratio, which is the rapport of retirement years to working years, is  $\mu = 0.57$ .

The calculations related to the revenues are based on employment data of average salaries according to sectors published by INSTAT (2007). The following assumption have been done because of the lack of detailed data corresponding employment salaries.

- 1- All the labor force founded in public institutions or in private sectors (except the agricultural sector) are categorised as well-paid individuals.
- 2- The work force founded in the agriculture sector are assumed to be poorly-paid individuals.
- 3- The Albanian informal economy, (in year 2004 OECD “measured” that the informal level in Albania to be 30%-60%), is assumed to be 50%.
- 4- All the individuals working at public institutions report their fully earnings.

Based on the above assumptions and data of INSTAT, employers distributions is as below:

$$f_R = 0.3; f_U = 0.12 \text{ and } f_L = 0.58$$

The rapport of earning distribution between well-paid and poorly-paid is calculated to be 4.3 (It is assumed that the average salary in the privat sector is 60.000 ALL, in the public sector 35.650 ALL and the minimal wage in the privat sector, excluding agricultiral sector, is 14.000 ALL). Briefly, the earning distribution is  $w_R = 4.3$ ,  $w_L = 1$ . The average reported wage is  $W_L = 2$ , which is consistend to albanian data published by the Institute of Statistics,  $2 \times 140000 = 28000$  ALL.

In addition, it is assumed also that the basic benefit is equal to the half of the average proportional pension  $b_0 = \tau W_L / (2\mu)$  and the contribution evander saves half the money that the Social Security would save from him from his hidden earnings,  $\sigma = \tau/2$ .

Table 1. Main Parameters

Parameter	Population distribution according to their reporting			$\sigma$
	$f_R$	$f_U$	$f_L$	
Base Run	0.3	0.12	0.58	0.119
Full Reporting	0.42	0	0.58	0.119
Every low earner evander	0.3	0.7	0	0.119

*Base Run*

The distribution is as follows:

$$f_R = 0.3; f_U = 0.12 \text{ and } f_L = 0.58$$

Table 2 presents the parameters and the benefits of the evander in three systems while table 3 summarises the consumption vectors.

Table 2. Parameters of three pension systems

Type	Contribution Rate		Tax Rate	The Evader's Benefit
	$\tau$	$\iota$		$b_u$
Proportional	0.239		0	0.42
+ Basic Benefit	0.119		0.099	0.674
+ Means-tested Benefit	0.179		0.05	0.314

Contribution rate is founded to be 0.239 for the Albanian case. This is the rate paid by the employer to the Social Securities. The Albanian system is near to the proportional system analized in this paper.

In the basic benefit system contribution rate is approximately halved, meanwhile a consumption tax of about 9.9% is added up. This system increases the benefits of evaders by around 60% but it does not make any distinction between full reports (R) and underreports (U).

A partial solution for this problem can be found by integrating a component of tested-means. By this, a considerable increase of contribution rate compared to basic benefits is found where consumption tax decreases from 9.9% to 5%.

The impact of explained systems in the consumption vectors can be seen in Table 3.

Table 3. Characteristics of three pension systems

Type	Young-age Consumption			Old-age Consumption		
	$c_R$	$c_U$	$c_L$	$c_R$	$c_U$	$c_L$
Proportional	3.272	3.668	0.761	1.806	0.813	0.420
+ Basic Benefit	3.413	3.701	0.794	1.229	0.999	0.607
+ Means-tested Benefit	3.354	3.687	0.780	1.350	0.811	0.674

The benefits of type R and L, without taking into account the taxes, are equal to the respective consumption in old-age. Not the same implication happens to the U type, which saves for consumption during the retirement. Even if the rate of U is not high enough, there is nothing to worry about U type individual consumption, because as seen in table 3, his consumption is 1.94 times greater than L type individual.

If the consumption level of young-age and old-age of different systems are compared, then the means-tested system is found to be superior to the basic one because this system supports the need's old-age consumption (L) rather than the evander's consumption.

Table 3.a. Characteristics of three pension systems in terms of  $W_R$

Type	Young-age Consumption			Old-age Consumption		
	$c_R$	$c_U$	$c_L$	$c_R$	$c_U$	$c_L$
Proportional	1.363	1.528	0.317	0.753	0.339	0.175
+ Basic Benefit	1.422	1.542	0.330	0.512	0.416	0.253
+ Means-tested Benefit	1.397	1.536	0.325	0.563	0.338	0.281

## No evaders

Even if the used assumption is non-realistic for the Albanian case, it is important to present the case when there are no evaders.

$$f_R = 0.42 \text{ and } f_U = 0$$

The contribution rate is the same as in the proportional system,  $\tau = 0.239$ . Table 4 includes the new parameters, while table 5 presents all the results according to the last parameters.

Table 4. Parameters of three pension systems (no evaders)

Type	Contribution Rate		Tax Rate
	$\tau$	$t$	
Proportional	0.239	0	
+ Basic Benefit	0.119	0.119	
+ Means-tested Benefit	0.175	0.064	

Since the evaders disappeared, in the basic system the tax rose from 9.9% to 11.9% and in means-tested system from 5% to 6.5%, while the contribution rate decreases from 17.9% to 9%.

Table 5. Characteristics of three pension systems (no evaders)

Type	Young-age Consumption			Old-age Consumption		
	$c_R$	$c_U$	$c_L$	$c_R$	$c_U$	$c_L$
Proportional	3.272	-	0.761	1.806	-	0.420
+ Basic Benefit	3.337	-	0.776	1.276	-	0.683
+Means-tested Benefit	3.320	-	0.772	1.320	-	0.775

The consumption changes are more complex. In the proportional system there is no change, while in the basic one the consumption of young-age increases (independently from income level), and the consumption of old-age decreases relating their income levels. The underlying fact is that these variations in the consumption levels are very low or insignificant. The means-tested system advantage compared to the basic one is diminished insignificantly. Low income elders' consumption decreases in both systems.

### Every low-paid is evader

This model supposes that low-paid individual is an evader.

$$f_R = 0.3 \text{ and } f_U = 0.7$$

Based on the definitions, means-tested system is reduced to a proportional system (since there are no individuals in need), this is the reason why we do not examine this case. Table 6 represents the new parameters while table 7 gives the results.

Table 6. Parameters of three pension systems (all evaders)

Type	Contribution Rate		Tax Rate	Evader's Benefits
	$\tau$	$t$	$b_u$	
Proportional	0.239	0.000	0.420	
+ Basic Benefit	0.119	0.056	0.653	

Here it can be observe just one change comparing to the basic system, the tax rate decreases from 11.9% to 5.6%.

Table 7. Characteristics of three pension systems (all evaders)

Type	Young-age Consumption			Old-age Consumption		
	$c_R$	$c_U$	$c_L$	$c_R$	$c_U$	$c_L$
Proportional	3.272	3.668	-	1.806	0.813	-
+ Basic Benefit	3.576	3.738	-	1.267	1.407	-

The changes occured in the pension basic system are as follow: the consumption of individuals which are no-evader and are high-paid is increased compared to the basic system. In the same time, the problem of pension basic system are found to be more evident, in this case the evaders exploit the full contributors.

## Conclusion

The aim of this study is to find possible answer to the question: Which of the social insurance systems is the best for the Albanian case? Three system types have been analysed by applying the actual albanian values. The findings of this study strongly support the means-tested system, given that this system has positive impact on the needy fraction of the population and shows only an increase in the pension of the low income people compared to basic system.

After all these detailed calculations, it can be concluded that, if all the evaders are excluded, and without making difference between the pension systems, the government has to choose the means-tested system and not that of basic one. In case the evaders can not be excluded, the solution is not so simple. Briefly, if the savings are directly connected to pension system, then the difference between consumption rates in both, means-tested and basic system are insignificant.

Another important issue to be mentioned is that the lower the part of proportional component in total pension, the higher the well-paid individuals number which underreport their wages.

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