

## A COMPARATIVE ANALYSIS BETWEEN UNIT-LINKED LIFE INSURANCE AND OTHER ALTERNATIVE INVESTMENTS

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### **Abstract**

*The unit-linked life insurance has two important components: protection and investment. The protection component refers to the insured sum in case of the occurrence of insured risks and the investment component refers to the policyholder's account that represents the present value of the units from the chosen investment funds. These financial products invest most of the premium paid by the insured person in the funds managed by the insurance company or an external administrator and the lower part of the premium is intended to cover the insured risk (death, disability, etc). An important component of the activity carried out by the insurance companies is the investment of the premiums paid by policyholders in various types of assets, in order to obtain higher yields than those guaranteed by the insurance contracts, while providing the necessary liquidity for the payment of insurance claims in case of occurrence of the assumed risks. This research contributes to the existing literature regarding the study of investment alternatives, with an exclusive focus on the investment in unit-linked life insurance. A special place in this study is the presentation of investments in unit-linked insurance versus other types of financial investments: deposits, treasury bills, shares (BET), currency (EURO) and gold.*

**Keywords:** *Unit-linked life insurance, alternative investments, investment programs, protection component, investment component,*

**JEL classification:** *G22, G14, C58, C87*

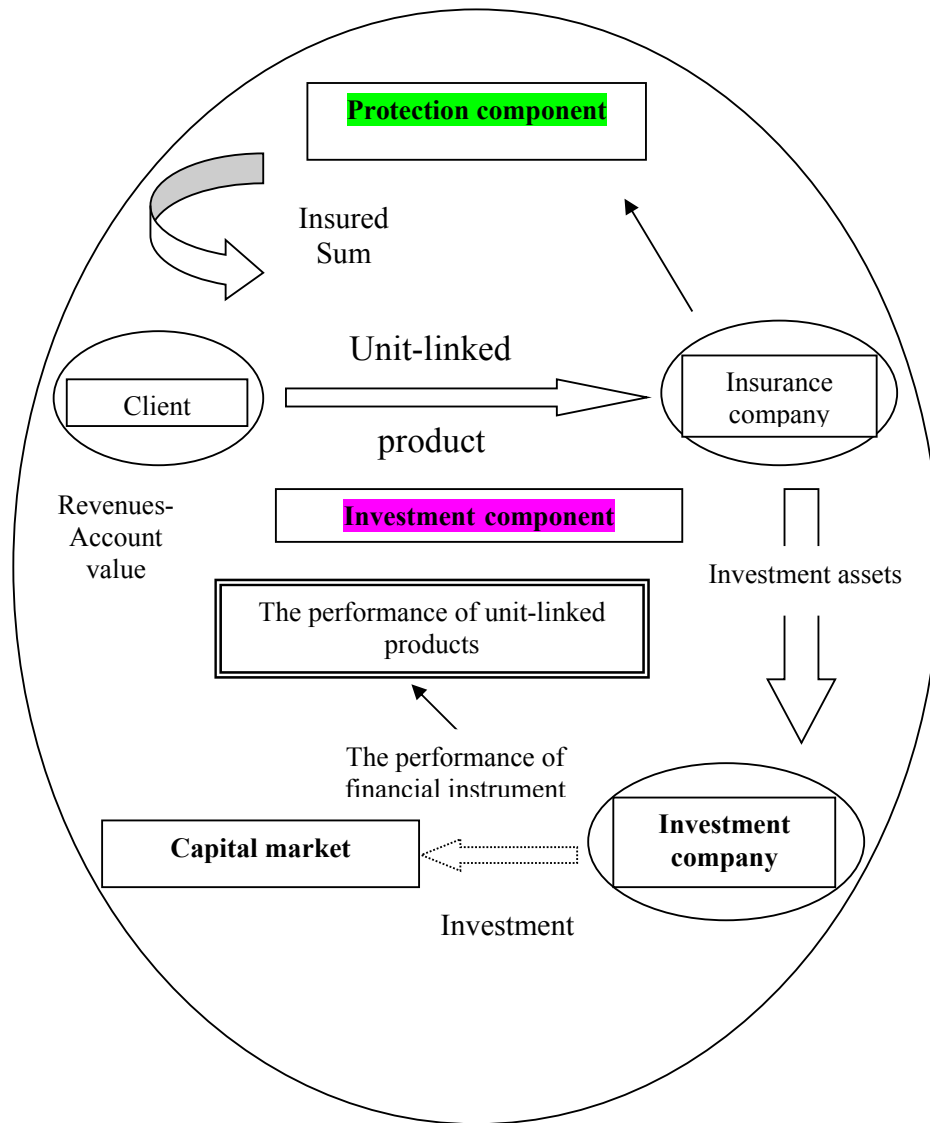
### **1. Introduction**

One of the most dynamic life insurance products in Romania is unit-linked insurance. Unit-linked insurance contracts have been studied worldwide since the middle of the 1970s. The payoff in such contracts depends on two factors: the value of some underlying financial instrument(s) and some insurance-type event in the life of the owner of the contract (death, retirement, survival to a certain date etc.) (Romanyuk, 2006).

As it is shown in (figure no. 1), unit-linked insurance is a life insurance policy with investment component. These financial products invest most of the premium paid by the insured person in the funds managed by the insurance company or an external administrator and the lower part of the premium is intended to cover the insured risk (death, disability, etc). The insurance premium paid by the policyholder is invested into one or more investment funds managed and provided by the insurer, from which the policyholder receives a share part (respectively a number of units). Each investment fund has its' own unit with individual prices. The insured person chooses the investments – the funds and the allocation between them. The policyholder has the right to choose the structure and the funds in which he will invest the premiums, with the possibility that during the term of the contract to change the initial allocation of his investment (Șerbănescu, 2009).

An important component of the activity carried out by the insurance companies is the investment of the premiums paid by policyholders in various types of assets, in order to obtain higher yields than those guaranteed by the insurance contracts, while providing the necessary liquidity for the payment of insurance claims in case of occurrence of the assumed risks. The policyholders' financial resources are invested by the insurance company in different types of financial assets: stocks, bonds, deposits and other capital market or monetary market instruments. In general the insurance companies which offer unit-linked policies manage several investment funds with different levels of risk: low, medium, high and very high. The revenues earned from investing the premiums are closely linked to the funds

performances and their associated risk. As in any ordinary financial investment, investment alternatives with a higher risk are those that can bring higher returns.



Source: Authors' processing

Figure no. 1 **Unit-linked life insurance components: investment and protection**

The payoff of these products contains both financial and insurance risk elements, which have to be priced so that the resulting premium is fair to both the seller (insurance company) and the buyer of the contract (policyholder) (Romanyuk, 2006). The essence of mortality risk is that individual lives are independent so that risks may be nearly eliminated by pooling and diversification. On the other hand investment risk affects all contracts simultaneously and in the same direction. Also, the securities markets themselves determine a relationship between risk and return which should be reflected in the pricing of investment risk (Boyle and Schwartz, 1977).

In comparison to traditional life insurance policy, where the investment risks are assumed by the insurance company and the insurer invests the premiums in financial instruments with lower profitability, in the case of unit-linked insurance policies the investment risks are assumed by the insured person, but the benefits of the investment depend on the investment funds' evolutions. The unit-linked life insurance has two important components: protection and investment. The protection component refers to the insured sum in case of the occurrence of insured risks and the investment component refers to the policyholder's account that represents the present value of the units from the chosen investment funds (Gavriletea, 2009).

**The objective of the study:**

The purpose of this paper is to develop a theoretical and empirical analysis regarding the investment in unit-linked life insurance. In order to fulfill this objective the authors have presented a comparative research regarding the investment in unit-linked life insurance and other types of alternative investments. This study aims to analyze the most profitable investment instrument.

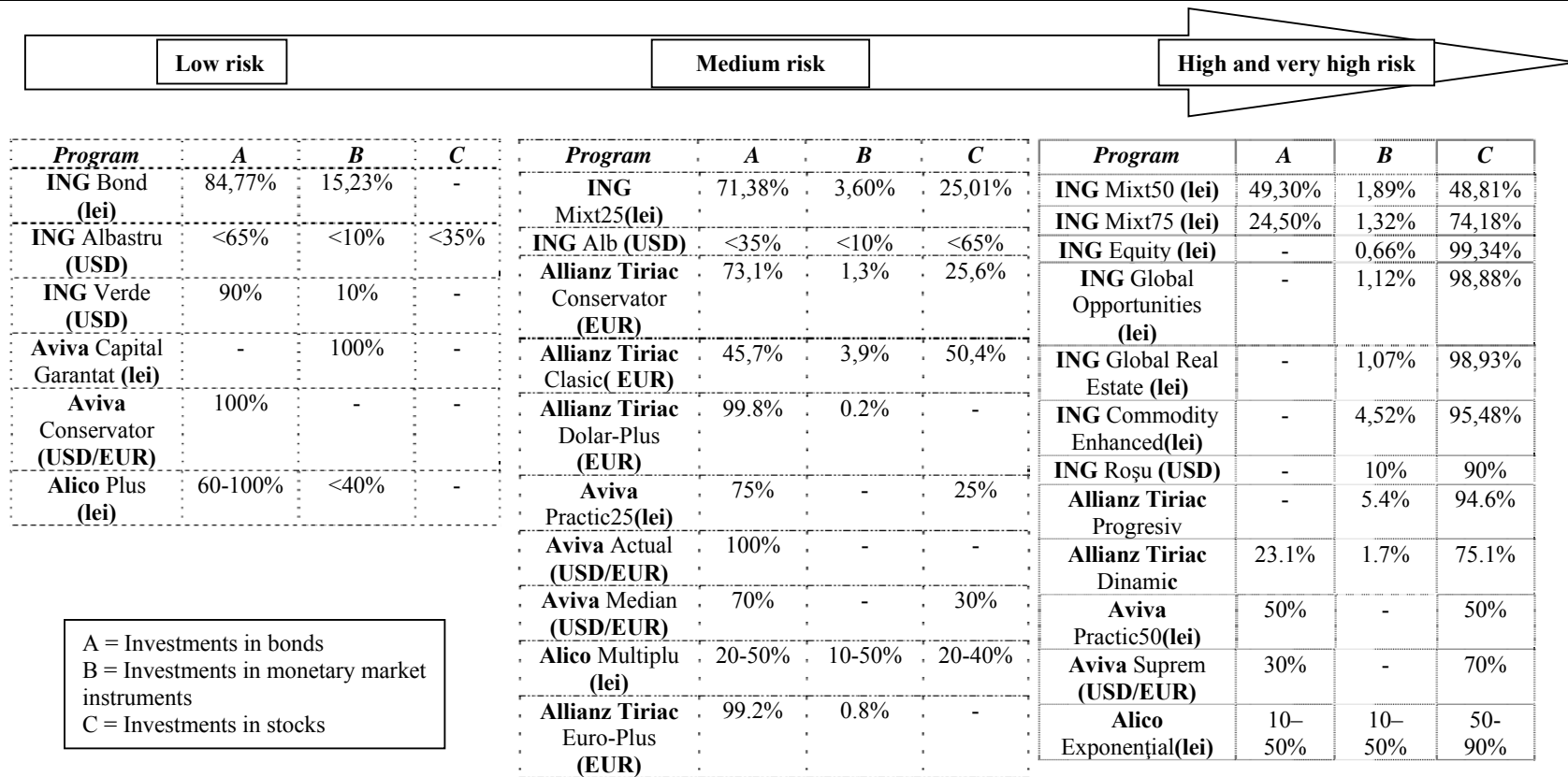
This study contributes to the existing literature regarding the theoretical and practical research of investment alternatives, with an exclusive focus on the investment in unit-linked life insurance. A special place in this study is the presentation of investments in unit-linked insurance versus other types of financial investments: deposits, treasury bills, shares (BET), currency (EURO) and gold.

The structure of this paper is as follows: Section 2 presents a comparative analysis of the main unit-linked investment programs offered by life insurance companies in Romania. Section 3 describes a comparative analysis of an investment in unit-linked life insurance versus other alternative investment strategies. Section 4 provides a summary of the main findings and some concluding remarks.

## **2. Comparative analysis of the main unit-linked investment programs offered by life insurance companies in Romania**

Romanian insurance companies offer a significant number of types of financial instruments, as it can be seen in the figure below, that are associated with a certain level of risk and profit, and the insured person chooses those investment programs according to his risk aversion and desire for gain.

In (figure no. 2) the authors have analyzed the investment programs structure of four insurance companies: ING, Aviva, Allianz Tiriac and Alico. For low risk, investment programs suitable for an insured person with a reduced appetite for risk, but on the other hand safe and stable gains are offered by three insurers: ING, Aviva and Alico. ING, the market leader in this segment of customers has three offers. The same generous offer of seven of twelve investment programs is proposed to clients with high and very high risk profile. Instead Allianz Tiriac comes with the highest number of programs, four investment programs for medium risk profile.



Source: Authors' processing based on the Reports of the following insurance companies: ING, ALLIANZ TIRIAC, AVIVA and ALICO.

Figure no. 2 Comparative presentation of investment programs offered by the major life insurance companies in Romania according to the associated degree of risk and the structure of the investment programs portfolio

### 3. Unit-linked life insurance investment versus other types of financial investments

This section presents a comparative analysis of a unit-linked life insurance investment with other alternative investment strategies (Treasury bills, Deposits, Shares, Gold, FOREX- Euro currency).

Nowadays the insured persons have become more aware of investment opportunities outside the insurance sector. So policyholders want to enjoy the benefits of equity investment in conjunction with mortality protection, and insurers around the world have developed unit-linked contracts to meet this challenge (Hardy, 2003). The benefits of these products are linked to the performance of an equity market (Gaillardetz, 2006).

In order to perform a comparative empirical simulation of a unit-linked life insurance investment with other types of financial investments: a deposit, Bucharest Stock Exchange (BET) shares, treasury bills, Foreign exchange market (FOREX)- Euro currency and gold, the authors considered the following elements:

- the term of the contract: 10 years (2001-2010);
- the insured person is aged between 35 and 45 years old;
- the insurance sum in the event of a death: 25,000 lei;
- the insured person has chosen to invest the insurance premium in two investment programs: in the first period (2001-2008) the policyholder has chosen an investment fund portfolio which invests 25% in shares issued by companies from the European Union and 75% in instruments with fixed income denominated in national currency; and in the second period (2008-2010) the policyholder has chosen an investment fund portfolio which invests up to 100% in domestic instruments with fixed income.
- the account value at the maturity of the contract: 19,402.76 lei;
- the total investment cost (the sum of annual insurance premiums) for the entire period: 16,857 lei.

Table no. 1 Total cost for a unit-linked life insurance investment

Period	2002	2003	2004	2005	2006
Gross insurance annual premium (lei) - $P_a$	1,094	1,367	1,572	1,886	1,886
The accumulated amount of annual gross premiums (lei) - $\sum_{i=2001}^{2009} P_a$	1,094	2,461	4,033	5,919	7,805

Period	2007	2008	2009	2010
Gross insurance annual premium (lei) - $P_a$	1,981	2,357	2,357	2,357
The accumulated amount of annual gross premiums (lei) - $\sum_{i=2001}^{2009} P_a$	9,786	12,143	14,500	16,857

Source: Authors' processing imported from Excel software.

Therefore the insured person pays an amount of 16,857 lei and obtains a capital gain of 2546 lei.

In order to compare different types of financial investments the authors took into consideration the following indicators:

- annual interest rates for the deposits denominated in national currency;
- logarithmic annual returns of BET index;
- annual yields for treasury bills denominated in national currency;
- logarithmic annual returns of exchange rates (EUR/RON);
- logarithmic annual returns of gold prices.

Table no. 2 Investment in deposits

<i>Period</i>	<b>2002</b>	<b>2003</b>	<b>2004</b>	<b>2005</b>	<b>2006</b>
<i>The deposited fund / year (lei)</i>	1,094	1,367	1,572	1,886	1,886
<i>The accumulated deposited fund(lei)</i>	1,094	2,461	4,033	5,919	7,805
<i>Interest rate (%)</i>	12.83	14.20	14.40	7.20	7.46
<i>Interest/ year (lei)</i>	140.36	369.39	654.16	509.97	707.12
<i>Final balance (lei)</i>	1,234.36	2,970.75	5,196.91	7,592.88	10,186.00

<i>Period</i>	<b>2007</b>	<b>2008</b>	<b>2009</b>	<b>2010</b>
<i>The deposited fund / year (lei)</i>	1,981	2,357	2,357	2,357
<i>The accumulated deposited fund (lei)</i>	9,786	12,143	14,500	16,857
<i>Interest rate (%)</i>	7.16	9.39	10.37	7.55
<i>Interest/ year (lei)</i>	871.16	1,445.61	1,990.81	1,777.69
<i>Final balance (lei)</i>	13,038.16	16,840.77	21,188.58	25,323.27

Source: Authors' processing imported from Excel software.

In this case the investor obtains a capital gain of 8467 lei.

Table no. 3 Investment in BET shares

<i>Period</i>	<b>2002</b>	<b>2003</b>	<b>2004</b>	<b>2005</b>	<b>2006</b>
<i>Initial balance / year (lei)</i>	1,094	1,367	1,572	1,886	1,886
<i>Accumulated initial balance (lei)</i>	1,094	2,461	4,033	5,919	7,805
<i>Logarithmic annual returns (%)</i>	78.75	26.93	69.80	41.14	20.07
<i>Capital gain / year (lei)</i>	861.51	894.89	4,040.76	4,820.20	3,697.89
<i>Final balance at the end of the year (lei)</i>	1,955.51	4,217.40	9,830.17	16,536.36	22,120.26

<i>Period</i>	<b>2007</b>	<b>2008</b>	<b>2009</b>	<b>2010</b>
<i>Initial balance / year (lei)</i>	1,981	2,357	2,357	2,357
<i>Accumulated initial balance (lei)</i>	9,786	12,143	14,500	16,857
<i>Logarithmic annual returns (%)</i>	19.93	-121.99	48.05	11.62
<i>Capital gain / year (lei)</i>	4,802.76	-38,134.66	-2,170.08	-503.17
<i>Final balance at the end of the year (lei)</i>	28,904.02	-6,873.64	-6,686.72	-4,832.89

Source: Authors' processing imported from Excel software.

In the case of an investment in BET shares the investor loses 21,990 lei.

Table no. 4 Investment in treasury bills

<i>Period</i>	<b>2002</b>	<b>2003</b>	<b>2004</b>	<b>2005</b>	<b>2006</b>
<i>Initial balance / year (lei)</i>	1,094	1,367	1,572	1,886	1,886
<i>Accumulated initial balance (lei)</i>	1,094	2,461	4,033	5,919	7,805
<i>Yield rate (%)</i>	17.30	18.00	16.40	5.40	-
<i>Gain / year (lei)</i>	189.26	477.05	770.69	397.22	-
<i>Final balance at the end of the year (lei)</i>	1,283.26	3,127.31	5,470.00	7,753.22	9,639.22

<i>Period</i>	<b>2007</b>	<b>2008</b>	<b>2009</b>	<b>2010</b>
<i>Initial balance / year (lei)</i>	1,981	2,357	2,357	2,357
<i>Accumulated initial balance (lei)</i>	9,786	12,143	14,500	16,857
<i>Yield rate (%)</i>	7.85	14.23	10.00	6.87
<i>Gain / year (lei)</i>	912.19	2,118.76	1,936.52	1,625.35
<i>Final balance at the end of the year (lei)</i>	12,532.41	17,008.17	21,301.69	25,284.04

Source: Authors' processing imported from Excel software.

In this particular situation the investor obtains a total gain of 8,427 lei.

Table no. 5 Investment in currencies (EUR)

<i>Period</i>	<b>2002</b>	<b>2003</b>	<b>2004</b>	<b>2005</b>	<b>2006</b>
<i>Initial balance / year (lei)</i>	1,094	1,367	1,572	1,886	1,886
<i>Accumulated initial balance (lei)</i>	1,094	2,461	4,033	5,919	7,805
<i>Logarithmic annual returns (%)</i>	22.51	16.34	-3.60	-7.57	-8.37
<i>Capital gain / year (lei)</i>	246.24	442.34	-169.99	-487.39	-656.25
<i>Final balance at the end of the year (lei)</i>	1,340.24	3,149.58	4,551.59	5,950.21	7,179.96

<i>Period</i>	<b>2007</b>	<b>2008</b>	<b>2009</b>	<b>2010</b>
<i>Initial balance / year (lei)</i>	1,981	2,357	2,357	2,357
<i>Accumulated initial balance (lei)</i>	9,786	12,143	14,500	16,857
<i>Logarithmic annual returns (%)</i>	6.54	9.88	5.92	1.33
<i>Capital gain / year (lei)</i>	598.99	1,197.45	927.57	252.07
<i>Final balance at the end of the year (lei)</i>	9,759.94	13,314.39	16,598.96	19,208.03

Source: Authors' processing imported from Excel software.

In this case the investor achieves a total gain of 2351 lei.

Table no. 6 Investment in gold

<i>Period</i>	<b>2002</b>	<b>2003</b>	<b>2004</b>	<b>2005</b>	<b>2006</b>
<i>Initial balance / year (lei)</i>	1,094	1,367	1,572	1,886	1,886
<i>Accumulated initial balance (lei)</i>	1,094	2,461	4,033	5,919	7,805
<i>Logarithmic annual returns (%)</i>	28.59	15.30	-6.59	22.39	2.43
<i>Capital gain / year (lei)</i>	312.82	424.38	-314.30	1,419.84	234.56
<i>Final balance at the end of the year (lei)</i>	1,406.82	3,198.20	4,455.90	7,761.74	9,882.30

<i>Period</i>	<b>2007</b>	<b>2008</b>	<b>2009</b>	<b>2010</b>
<i>Initial balance / year (lei)</i>	1,981	2,357	2,357	2,357
<i>Accumulated initial balance</i>	9,786	12,143	14,500	16,857
<i>Logarithmic annual returns (%)</i>	22.04	18.54	27.98	33.30
<i>Capital gain / year (lei)</i>	2,614.13	3,120.94	6,243.84	10,293.58
<i>Final balance at the end of the year (lei)</i>	14,477.43	19,955.38	28,556.22	41,206.80

Source: Authors' processing imported from Excel software.

In the case of an investment in gold, the investor obtains a total gain of 24,350 lei.

#### 4. Conclusions

Unit-linked life insurance contracts are very popular and widely used on the insurance market. They provide either death benefit or maturity benefit or both. The benefits are linked to an underlying asset with or without certain guarantees so that the policyholders have the opportunity to participate in the financial market and (eventually) be protected from the downside development of the financial market (Li and Szimayer, 2011).

In recent years insurers have provided more flexible products that combine the death benefit coverage with a significant investment element, as a way of competing for policyholders' savings with other institutions, for example: banks, investment companies, stock markets, exchange markets, etc. Additional flexibility also allows policyholders to purchase less insurance when their finances are tight, and then increase the insurance coverage when they have more money available (Dickson et. al, 2009).

These products bear two different (independent) types of risk. First of all, we can look at the financial risk (related to the market). This risk was clearly stressed during the last few years, when the major stock market indices have dropped so much. On the other hand, the insurer deals with another type of risk - actuarial risk, related to the possibility of death for the insured (and hence the possibility of a claim) (Argesanu, 2004).

The results from (table no. 7) and (graph no. 1) show that the most profitable investment strategy is the alternative investment in gold and the less profitable is the investment in shares. These results are linked to the global financial markets situation and it is known that since 2008 the Financial Crisis has negatively influenced the worldwide financial markets. As a consequence, investors try to reduce the investment risk and place their financial resources in bonds and other fixed income securities, and also in bank deposits, which generate a stable and secure gain.

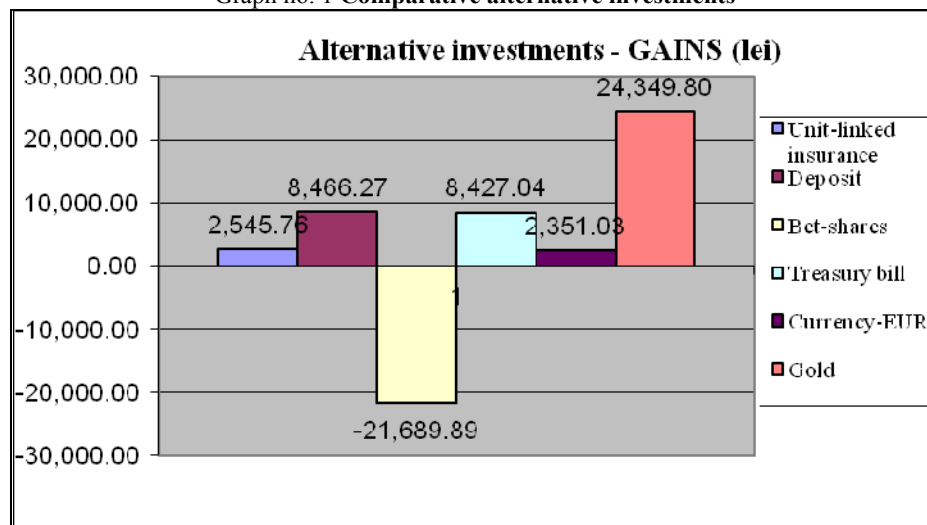


Table no. 7 Summary of the comparative alternative investments

Types of investments	Unit-linked insurance	Deposit	Bet-shares
Initial balance- Effort (lei)	16,857	16,857	16,857
Final balance- Effect (lei)	19,402.76	25,323.27	-4,832.89
Gain (lei)	2,545.76	8,466.27	-21,689.89
Gain (%)	15.10	50.22	-128.67
Types of investments	Treasury bill	Currency - EUR	Gold
Initial balance- Effort (lei)	16,857	16,857	16,857
Final balance- Effect (lei)	25,284.04	19,208.03	41,206.80
Gain (lei)	8,427.04	2,351.03	24,349.80
Gain (%)	49.99	13.95	144.45

Source: Authors' processing imported from Excel software.

Graph no. 1 Comparative alternative investments



Source: Authors' processing imported from Excel software

After analyzing the unit-linked insurance investment strategy in comparison with the other alternative investments, the authors may conclude the fact that even if the financial crisis has affected negatively the financial sector, and implicitly the insurance sector, the investment in unit-linked life insurance has generated capital gain at the end of the contract. Although the total gain (2,546 lei - 15%) is not very significant comparing with the capital gains generated by the investment in gold, deposits and treasury bills, the insured person can benefit also from the protection component (the insured sum is 25,000 lei). The reason why unit-linked insurance funds have suffered a lower depreciation comparing to stock market indices is because the insurance companies have avoided investing the capital 100% in shares. Also the insured person has chosen to invest the insurance premium in two investment programs in order to reduce the investment risk.

## 5. Acknowledgement

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