THE PSYCHOMETRIC PARAMETERS OF THE TECHNIQUE OF PSYCHODIAGNOSTIC OF MONEY ILLUSION

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Statement and situation of development of the problem

Money Illusion (later MI) describes the tendency of people to take the nominal value of money, not its real purchasing power[1]. The term was introduced by Irving Fisher and he gave his economic definition. Fisher first began to discuss the problem of inconsistency of variability of money purchasing power and its constant perception. As he aptly remarked: in our perception "the dollar is the dollar" and "franc is the franc," although in 1913 by 70 cents we could buy as many goods as by 100 cents in 1928. And it is correct to assert that the dollar costs about 70 cents or its purchasing power is such. Despite, the public doesn't know that such problem exists and the study of this phenomenon is only within a narrow range of scientific discussions[2].

Many studies of MI are conducted in the framework of perception and evaluation of one currency, although in present living conditions the economic agents are in a situation where they must perceive and evaluate products with different currencies. Under these conditions, the central problem of MI is the problem of studying the factors of perception and evaluation of the exchange rate (problem of currency perception)[3]. When the European Union passed to Euro, the study aimed at the perception and evaluation of the exchange rate become more relevant and in different countries the researchers began studying the psychological aspects of the currency change and associated behavior of economic agents. The most interesting is that until now to diagnose the presence or absence of money illusion each researcher applies individually designed psychodiagnostic instruments which, in most cases do not provide a measure of the value of MI, or, i.e. its coefficient. Even more studies are based on field observations.

Interesting pattern is observed by P. Ragubir and J. Srivastava from Berkeley and Maryland Universities. U.S. citizens differently build their consumer behavior in Canada and UK (US $ 1.00 = C $ 1.50 = £ .67), although they are well aware of the rates. Their main hypothesis was based on the idea, which they would overspend in both countries, because foreign currency is perceived as play money or unspent, because they do not know the denomination, or in different countries behave differently.

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[1] **Shafir E., Diamond P., Tversky A**. Money Illusion. The Quarterly Journal of Economics, Vol. 112, No. 2. 1997, pp. 341-374.

[2] **Fisher, Irving** The Money Illusion, New York: Adelphi Company, 1928, p. 245.

[3] **Gamble, A., Gärling T., Charlton, J.P. & Ranyard, R**. Euro illusion: Psychological insights into price evaluations with a unitary currency. // "European Psychologist", Vol.7, (4), 2002. pp. 302-311.

The main results of their research can be summarized in the following points:

- people tend to unspend if foreign currency is much lower than the one of their own country,
- people tend to overspend, if foreign currency is much higher than the one of their own country.

In this study the authors have modeled the role of time pressure and experience (knowledge) in perception of MI, which is interesting for us. The first of these factors (the time pressure) is external - as a factor of essentiality of goods in the study of Gamble A. and others. Authors found a positive correlation between time pressure and MI. It turns out that the more the time pressure is the more mistakes people make in estimating the real value of goods[4].

In this context, an interesting study coducted P. Lemaire and M. Lekasher studying the strategies of currency conversion (FF-Euro, Euro-FF) among old and young people. Young people use more different strategies for conversion of currency which differ in speed and accuracy. Both categories of people use similar strategies, but the choice of a specific strategy depends on the transition FF-Euro or Euro-FF, as well as cognitive strategies of the subject[5].

Based on the results of these studies and on the fact that MI is easier and more reliable investigated on the measurement of consumer behavior in different currencies, we have designed our method of MI measurement.

The description of the developed technique

The technique, developed by us, which aims at measuring the coefficient of MI, consists of 10-trading proposals, five of which are offered in the Armenian currency (AMD), 5 - in U.S. dollars (USD). The U.S. currency has been selected based on the fact, that it is the most common and perceived currency by Armenians. Subjects were given the nominal (initial) price of purchase and are invited to nominate a price (with discount), which they are ready to pay for the goods (see Figure 1, 2).

Fig. 1

Trade proposal in AMD

KETTLE

Initial price   AMD 11650

You are ready to pay

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[4] **Raghubir, P., & Srivastava, J**. Effect of face value on product valuation in foreign currencies. // "Journal of Consumer Research", 29, 2002. pp. 335-347.

[5] **Lemaire, P., & Lecacheur, M**. Older and younger adult's strategy use in currency conversion tasks: Insights from French franc to Euro and Euro to French franc conversion. // "Journal of Experimental Psychology", 3, 2001, pp. 195–206.

Fig. 2

Trade proposal in USD

DIGITAL WEB-CAM
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Initial price $ 18,9

You are ready to pay

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As a result the averages of price reduction in AMD and USD given by subjects will be calculated. The coefficient of MI is calculated by dividing the percent of price reduction in AMD into the percent of price reduction in USD. We assume that this coefficient reflects the subjective value of MI. Note also, that in trade offerings, we included household goods (excluding goods of first necessity, where MI doesn't occur, according to a theoretical review).

125 subjects participated in our study for approbation of presented technique, who offered their discounts for purchasing 10 trade proposals - 5 on AMD and 5 on USD.

The discussion of main results

First look at the descriptive statistical results of the discounts that were offered by the subjects in two different currencies. The main results are presented in Table 1.

Tab. 1

Descriptive Statistics for discounts in AMD and USD

	N	Min.	Max.	Mode	Median	Mean	Std. Dev.
Discount AMD	125	17	74	36	42	42,85	13,43
Discount USD	125	10	76	27	27	30,72	12,47

As we can see from the table the maximums of discounts offered in both currencies are almost identical (AMD - 74, USD - 76), the same pattern is almost true to the minimums (AMD - 17, USD - 10). It is obvious, that there is a difference of 7 points, but speaking about the minimum and maximum bounds of discounts of both rates, we can assert that they do not differ from each other.

An interesting pattern is observed in the study of measures of central tendencies. The mode, the median and the average differ in two scales, and it is

evident that the discount in AMD is higher, than in USD. The statistical significance of this difference, we will discuss later. As for the measure of variance - the standard deviation is identical (discount AMD - 13,43; discount USD - 12,47). The next stage of study of validity and reliability of the technique is the measuring the data distribution in two scales. For this, we have built the plots of data distribution for discounts in both currencies. The plots of data's distribution are presented respectively in Figures 3 and 4.

Fig. 3

Data distribution of discounts in AMD

Fig. 4

Data distribution of discounts in USD
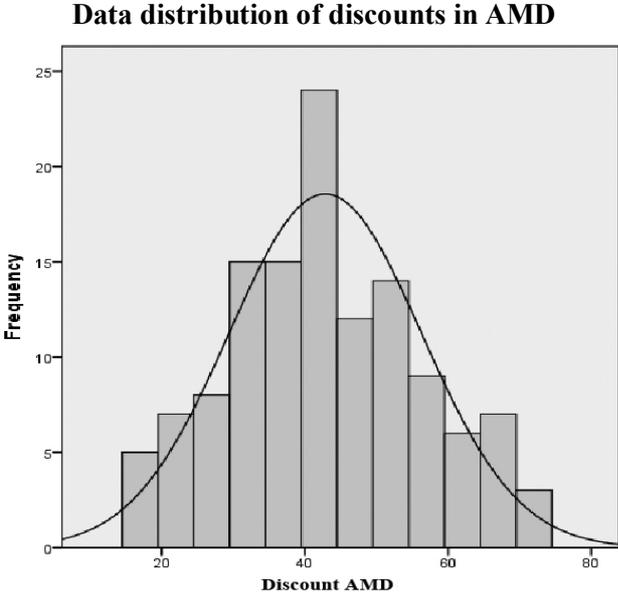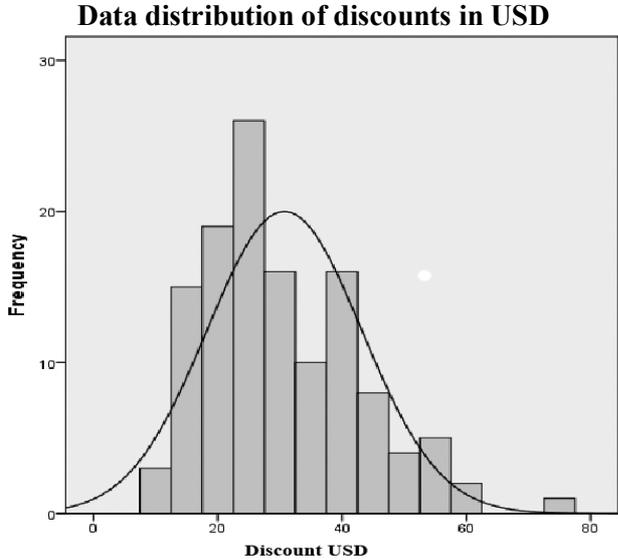
As can be seen from Figure 3 the data distribution of AMD discounts is ideally approached to Normal. In the data distribution of USD discounts (Fig. 4), negative skewness is apparent, but the kurtosis is not noticed. For a more thorough analysis of the scatters we conducted two tests for verification of distribution - the calculation of skewness, kurtosis and their standard errors and One-Sample Kolmogorov-Smirnov Test. The results are presented in Table 2.

Tab. 2

Results of tests for verification of distribution for discounts in AMD and USD

		Discount AMD	**Discount USD**
N		125	125
Skewness		,196	,816
Std. Error of Skewness		,217	,217
Kurtosis		-,529	,533
Std. Error of Kurtosis		,430	,430
Most Extreme Differences	Absolute	,058	,121
	Positive	,058	,121
	Negative	-,037	-,059
Kolmogorov-Smirnov Z		,647	1,356
Asymp. Sig. (2-tailed)		,797	,051

The first test aims at checking the normality of the distribution by calculating asymmetry and excess, and if they are in absolute value below their standard deviations, it shows the normality of distribution. In regard to the scale of AMD discounts, the indexes of asymmetry and kurtosis are below their standard errors (Skewness, 196; Std. Error of Skewness, 217; Kurtosis -, 529; Std. Error of Kurtosis, 430). As for USD discounts, obvious negative skewness is ascertained (Skewness, 816; Std. Error of Skewness, 217), and kurtosis index is negligible (Kurtosis, 533; Std. Error of Kurtosis, 430).

For more precise analysis of data we used One-Sample Kolmogorov-Smirnov test. It is a non-parametric test and if asymp. sig. (2-tailed) (p) of Z Kolmogorov-Smirnov supremely .05, we can state the normality of data distribution. As can be seen in Table 2, for the scale of AMD discount p=, 797, and for the scale of USD discount p=, 051. This means that despite the presence of a clear skewness in the scale of USD discount, the data distribution is closer to normal. Based on this we can assume that the measurement with this tool is valid and reliable.

In the next stage of data analysis we have carried out the normalization of data by the method of quartile distribution. The results are presented in Table 3.

Tab. 3

Frequencies statistics for discounts in AMD and USD

		Discount AMD	Discount USD
N	Valid	125	125
	Missing	0	0
Percentiles	25	33,50	21,00
	50	42,00	27,00
	75	51,00	39,00

From the data of Table 3, we can establish that in the scale of AMD discount the results may have been deemed low if they are below 33.5 and high if they are above 51. And in the scale of USD discount the results may have been deemed low if they are below 21 and high if they are above 39. Based on these results we can construct the scale of the spread of values for the two scales.

- Scale of AMD discount - low <33.5< mean<51<high
- Scale of USD discount - low <21< mean<39<high

Now we can turn to a comparison of the offered discounts in different currencies (own (AMD) and its, which exchange rate is higher (USD)). The results are presented in Figure 4.

Fig. 4

Means for Discount AMD and USD
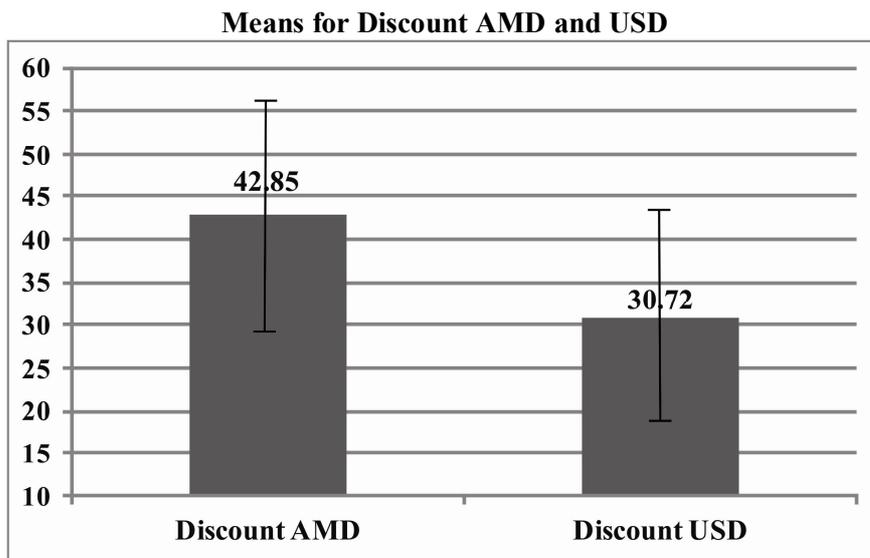
As we can see on the chart there is about 12 percent difference between the discounts in different currencies. To establish the statistical significance of this difference, we have applied a Student T-test for Independent Samples, the results of which are presented in Table 4.

Tab. 4

Results of Independent Samples T-Test

Discount AMD-USD *Equal variances assumed*	Levene's Test For Equality of Variances		t-test for Equality of Means						
	F	Sig.	t	df	Sig. (2-tailed)	Mean Diff.	Std. Error Diff.	Lower	Upper
								95% Conf. Interval of the Diff.	
assumed	,651	,420	7,39	248	,000	12,13	1,64	8,899	15,357

The Levene's Test criterion shows that variances of both scales are equal (p=, 42) and T-Test is applicable for those scales, and the difference in the 12,13% is statistically significant (p=,000). Now we can surely affirm that consumers are ready to pay 12% more in USD, than in AMD. And we can pre-approve, that our technique allows measuring the existence and value of MI.

The next step in the formation and testing of the technique is the evolution of a certain coefficient of MI. We hypothesized that this coefficient can be calculated by dividing the percent of AMD discount into USD discount. And if this coefficient is greater than 1, it indicates the presence of MI, if less, the MI is not observed. Within the framework of this work we have just calculated those coefficients for experimental group and have developed its statistical norms. The descriptive statistics are presented in Table 5.

As it can be seen from the results the coefficient of MI ranged from, 85 to 2,89. This means that in experimental group there are subjects who haven't MI manifestation (<1) and subjects who have a very high index of MI (up to 2,59).

Tab. 5

Descriptive Statistics for MI coefficient

	N	Min.	Max.	Mode	Median	Mean	Std. Dev.
MI coefficient	125	,85	2,59	1,41	1,41	1,50	,48608

The measures of central tendency are almost identical, which is the most interesting fact. The main thing is that the mode, the median and the mean of the scale is more than 1.4, which means that the group is characterized by certain level of manifestation of MI. At first we tried to establish the normality of data distribution by plotting the graph.

Fig. 5

Data distribution of MI coefficient
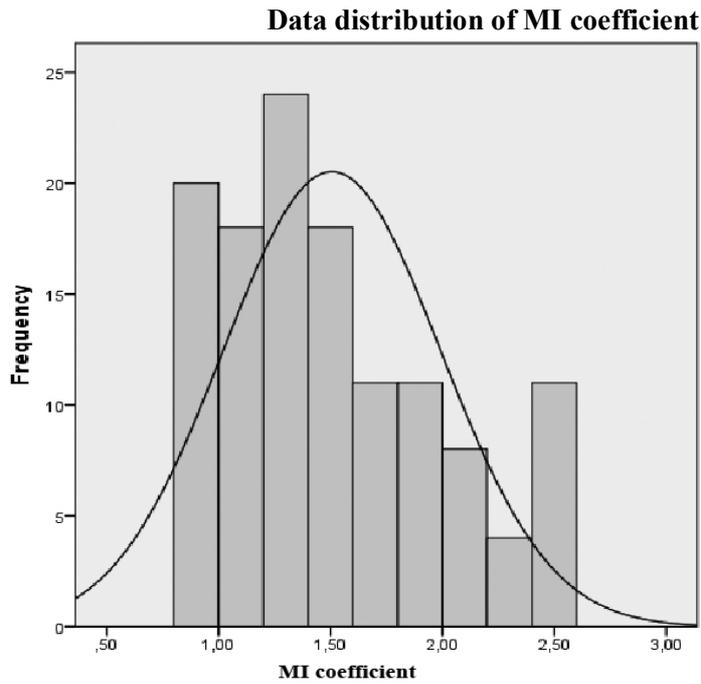
On the graph we see a small skewness to the left, which means that high values of MI are rare and most of the manifestation of MI are below the value 2. To better understand this phenomenon, we turn to the percentile norma-lization of data, which results are presented in Table 6.

Tab. 6

Frequencies statistics for MI coefficient

		Discount AMD
N	Valid	125
	Missing	0
Percentiles	10	,9300
	20	1,0520
	30	1,1900
	40	1,3100
	50	1,4100
	60	1,5000
	70	1,7220
	80	1,9540
	90	2,3540

From the table it follows that:
- Only less than 20% of the subjects don't show MI,
- Only 20% of the subjects show the MI coefficient greater than 2,
- Most of participants (60%) display the coefficient MI, from 1 to 2 and half of them (more than 30%) are in the range 1.2 to 1.5.

For further analysis, we applied both methods of verification of the normality of data distribution as can be seen in Table 7, for the scale of MI coefficient the Z Kolmogorov-Smirnov $p=,076$. This means that the data distribution is closer to normal.

Tab. 7

Results of tests for verification of distribution for MI coefficient

		MI coefficient
N		125
Skewness		,676
Std. Error of Skewness		,217
Kurtosis		-,523
Std. Error of Kurtosis		,430
Most Extreme Differences	Absolute	,114
	Positive	,114
	Negative	-,089
Kolmogorov-Smirnov Z		1,278
Asymp. Sig. (2-tailed)		,076

With regard to the method of calculating skewness and kurtosis, the data prove once again that the negative skewness is established in this scale (Skewness, 676; Std. Error of Skewness ,217), and there are no kurtosis (Kurtosis -,523; Std. Error of Kurtosis ,430).

Conclusion

As a result we established:
- The technique developed by us allows diagnosing the existence of money illusion validly and reliably.
- Money illusion is a stable psychological phenomenon of consumer behavior, which causes our irrational buying behavior in foreign currency.
- The results show that the Armenian buyers are willing to pay for goods 50% more if they are presented in US dollars – "Dollar illusion" (a special case of money illusion).
- "The dollar illusion" is observed on more than 80% of the population and the average coefficient of it is 1,5.

- Perception of prices in dollar is one form of the manifestations of money illusion, and for a complete understanding of this phenomenon further researches of perception of other currencies is needed (Euro, Russian ruble).

ԴԱՎԻԹ ՀԱՅՐԱՊԵՏՅԱՆ – *Դրամային պատրանքի հոգեդիագնոստիկ մեթոդիկայի հոգեչափողական ցուցանիշները* – Հոդվածում ներկայացված են դրամային պատրանքի հոգեծանաչման նոր մեթոդի փորձարական ուսումնասիրման հիմնական արդյունքները, որոնք հիմնված են սեփական երկրի և արտարժույթի ընկալման համեմատական գնահատման վրա։ Ներկայացված են դրամային պատրանքի գործակցի արտածման տեխնոլոգիան, ինչպես նաև վերջինիս հոգեչափական նորմատիվները։ Մշակված մեթոդը օժտված է հոգեծանաչողական վալիդության ու հուսալիության բարձր ցուցանիշներով և կարող է օգտագործվել սպառողական վարքագծի ուսումնասիրմամբ զբաղվող մասնագետների կողմից:

ДАВИД АЙРАПЕТЯН – *Психометрические показатели психодиагностической методики денежной иллюзии.* – Новый метод психодиагностики денежной иллюзии основан на сравнительной оценке восприятия собственной и иностранной валюты. В статье изложены основные результаты связанного с этим метода экспериментального исследования. Представлена технология, по которой вычисляется коэффициент денежной иллюзии, а также его психометрические нормативы. Новый метод отличается высокими показателями психодиагностической валидности и надёжности, его сможет использовать широкий круг исследователей, интересующихся потребительским поведением.