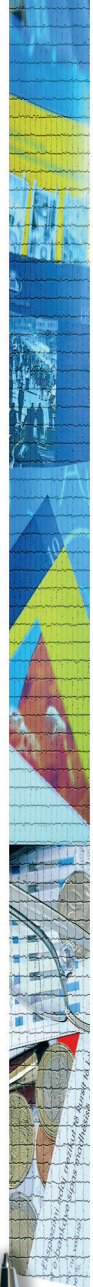


**PAYMENT INSTRUMENTS AS
PERCEIVED BY ALBANIAN
CONSUMERS – “PROBIT MODEL”
ESTIMATIONS ON A PUBLIC
SURVEY**

Alban Pllaha
Kliti Ceca
Valentina Semi

18 (57) 2016 WORKING PAPER



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BANK OF ALBANIA

Alban Pllaha

Research Department, Bank of Albania, e-mail: apllaha@bankofalbania.org

Kliti Ceca

Research Department, Bank of Albania, e-mail: kceca@bankofalbania.org

Valentina Semi

Payment Systems and Accounting and Finance Department,
Bank of Albania, e-mail: vsemi@bankofalbania.org

Note: The views expressed in this paper are of the authors and do not necessarily reflect the views of the Bank of Albania.

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ABSTRACT

This material aims to identify whether or not consumers' socio – demographics characteristics such as: education, family size, age, gender, employment status and income, play a role on payment choice behavior for the Albanian consumers. Using a binary choice model (Probit model) this study utilizes micro data drawn from the public survey carried out by Bank of Albania (March – April 2012) on the usage of payment instruments by Albanian consumers. Among other things, Probit model results suggest that socio-demographic characteristics such as education, income level and employment status do influence consumers' habits in using specific payment instruments at different POS situations. These outcomes reconfirm thus (econometrically), the hypothesis raised by Ceca, Pllaha and Semi (2013). In addition, the above findings are in line with the findings of international literature such as Junker (2005) and Arango, Huynh & Sabetti (2011), whom also suggest that consumers' socio-demographic characteristics play an important role in consumers' payment choice behavior.

Key words: Payment instruments, point of sale, consumer choice behavior, Probit model, socio – demographic characteristics, Bank of Albania, Albanian consumers, payment method, POS.

JEL Classifications: C25, E5, E52, E58, J1, J10, J33

1. INTRODUCTION

It would have been unusual, some 20 years ago, for a typical consumer to enter a retail shop, restaurant or other similar Points of Sale (POS) without any cash in his/her pocket and still buy or get the desired goods or services. Nowadays, however, such buying behavior can be considered quite normal. Recent developments in technology, modernization of retail payments, innovations in consumer services and efficiency in banking services offer to consumers a wide variety of non-cash payments. Consequently, payment alternatives and behaviors are constantly changing. Some of the main reasons that contribute to the transition toward these non-cash means of payment are listed next: more security (from theft), more cost efficient, personalized payment instruments, less informality in the economy, electronic transactions worldwide, traceable transactions, etc. The majority of payment instruments available in the market (credit transfer, direct debit, payment cards, cheques and promissory notes) satisfy most of the above features; however, their usage by Albanian consumers remains still far below when compared to the usage of cash and, when compared to other regional countries, the usage of payment instruments in Albania seems to be considerably below.

There are two main indicators/ratios to measure the usage of cash in an economy: "Currency in Circulation/ GDP¹ and Currency in Circulation/ M1²". Graph 1 (in the annex section) shows that the level (ratio) of cash transactions in developing countries of South Eastern Europe is noticeably higher than in developed European countries. The ratio of cash in circulation as % of M1 in Graph

¹ There are several indicators showing the relative significance of the currency in circulation in an economy, among which the most important ones are: 1/ share of currency in circulation in money supply; and 2/ ratio of currency in circulation in nominal gross domestic product. The last one measures the importance of cash as mean of settlement used by non-banks relative to the size of the economy. A higher ratio means greater use of basic instruments as against more advanced methods (Economic Research, Federal Reserve Bank, 2012).

² Taking in consideration that the components of M1 are currency in circulation (CC) and demand deposits, the ration of CC/M1 shows the possibility of public to make their transaction through cash or through a modern payment mean. In this context, a higher ratio shows of CC/M1 a lower possibility a transaction to be made by e-payment (Economic Research, Federal Reserve Bank, 2012).

2 (in the annex section) also confirms this tendency. International experience has shown that, the usage of electronic payments is negatively related to cash in circulation. However, both graphical representations (Graph 1 and 2) show that Albania has one of the highest levels of cash in circulation in its economy, thus, low usage of non-cash payment instruments.

The main target of Bank of Albania is to "achieve and maintain price stability" in the economy. A well-functioning payments system enables the efficient implementation of monetary policy. "Promoting a smooth operation of payment systems is a principal task of the Bank of Albania. Therefore one of the roles of the Bank of Albania is to act as catalyst in promoting efficiency across payment systems and payments instruments. Bank of Albania has a major role and commitment in developing the national payment system, particularly because of its strong interest in financial stability, its concern to ensure the proper functioning of the banking and financial system and its principal function to implement the country's monetary policy." Payment Systems, Bank of Albania (2004 - 2013).

Besides other things, Bank of Albania is directly interested in identifying factors that influence consumers' choice on payment instruments. Therefore, the hypothesis question of this discussion paper is: what determines consumers' choices on payment instruments and how can these choices be oriented toward more efficient instruments? To answer this question we use data obtained by the public survey carried out by Bank of Albania, in March – April 2012, on the usage of payment instruments by Albanian consumers (please refer to Ceca, Pllaha and Semi 2013). Among other results, their analyses suggest that consumers' payment behavior is influenced by several socio – demographic characteristics. Using a binary choice model (Probit model), this material aims to identify (econometrically) whether or not consumers' socio – demographics characteristics play a role (statistically important) on payment choice behavior for the Albanian consumers.

The structure of this discussion paper is as follows: Section 2 offers an overview on the literature consulted and the situation of payment instruments in Albania, Section 3 describes the conducted

survey, dataset and some descriptive statistics, Section 4 deals with consumers' choices behavior on payment instruments, Section 5 discusses the Probit model utilized in this paper and reveals some of the results, Section 6 concludes some of the findings and offers few suggests.

2. RELATED LITERATURE REVIEW AND RECENT DEVELOPMENTS IN PAYMENT INSTRUMENTS

2.1. RELATED LITERATURE REVIEW

Scholars nowadays are showing more and more attention in studying consumers' choice behavior on payment means. Some of the main reasons motivating these studies are listed next: reducing informality in the economy, more efficient monetary policies, cheaper payment methods, facilitating trade and payment transactions, etc. For instance, Arango, Huynh & Sabetti (2011) try to identify whether or not consumers' socioeconomic characteristics and payment instrument features influence consumers' choices on specific payment instruments. They apply discrete-choice models, utilizing survey data from Canadian consumers on payment instruments (conducted by Bank of Canada in 2009). Their findings suggest that the usage of cash remains still high for low value transactions mostly because speed, wide acceptance level and low costs. "Debit and credit cards are used more frequently for higher transaction values where safety, record keeping, the ability to delay payment and credit card rewards gain prominence".

Kalckreuth Schmidt & Stix (2011) use data from a survey conducted in Germany on usage of cash in monitoring liquidity. Their findings suggest that cash is largely used by consumers who need to keep control over their liquidity. They also suggest that consumers switch to electronic payments when paying larger values. The European Central Bank (April 2011), also conducted two surveys on the usage of banknotes in several Euro Area countries. One of the surveys focused on households while the other one

on non-financial companies. One of the findings of these studies was that “the value of cash payments is still high, when compared to card payments”. In their research study, Kalckreuth Schmidt & Stix (2009) suggest that German consumers make most of their payments by using cash (82% in terms of transactions and 58% in terms of value). They also suggest that older consumers use cash more than younger consumers. Their study also reveals that such tendency is mostly explained by the difference in the characteristics existing between these two age groups. Jonker (2005) undertakes a comprehensive research initiative on trying to identify how do the socioeconomic characteristics of consumers and payment instrument features influence payment behaviour of Dutch consumers. Their findings suggest that Dutch consumers perceive cash as being an inexpensive method of payment, while they associate electronic payment cards as being more expensive. This study also underlines that the choice of payment instruments is also influenced by non-cost features of specific payment instruments.

As discussed above, academic attention on consumers’ choice behaviour on payment instruments is continuously attracting more and more attention in western countries in recent years. However, academic research on these topics remains an unexplored field in the Albanian economy until now. To the authors’ best knowledge, this research paper is the first initiative in assessing consumers’ perceptions in choice behaviour decisions on payment instruments in Albania.

2.2. RECENT DEVELOPMENTS IN PAYMENT INSTRUMENTS IN THE ALBANIAN ECONOMY

The Albanian authorities and other important actors in the market (Bank of Albania, commercial banks, card issuers and electronic payments service providers) have undertaken several legal and administrative initiatives to reduce cash transactions, with the final objective of combating informality in the economy. The intention of these initiatives is to promote, support and encourage the usage of non-cash payment instruments by Albanian consumers.

In recent years the Albanian banking system has evidenced a shift, although moderated, from cash toward non-cash payments. Paper based payment instruments still dominate transactions, although electronic payments are becoming gradually part of banking practice. These changes appear to be driven by a combination of the suitability they offer and the technological developments. Nevertheless, these changes in consumers' payment behaviour appear to be slow. International practice has shown that fundamental changes in payment service behaviour take 5 to 10 years to be widely accepted.

In addition, in the recent years banks have expanded the range of banking services, offering their customers a wider choice of electronic payment instruments like payment cards (debit & credit) and home banking for making payments or transfers of funds from one account to another.

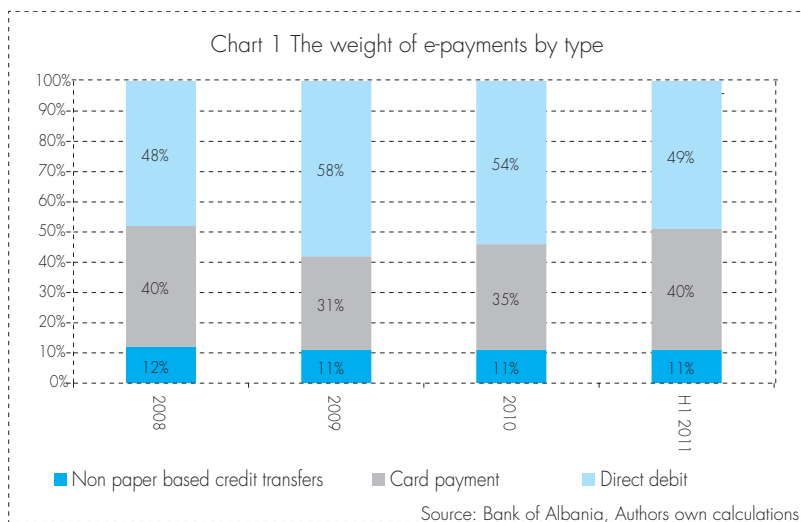
Table 1. The importance of payment instruments in Albania.

	2008		2009		2010		H1 2011	
	Volume	Value	Volume	Value	Volume	Value	Volume	Value
Customer credit transfers	88.30%	97.96%	82.16%	96%	81.08%	94.25%	80.33%	95%
1- Paper-based credit transfers	86.91%	96.27%	80.18%	94%	78.88%	91.56%	78.05%	93%
2- Non-paper-based credit transfers	1.40%	1.69%	1.98%	2%	2.20%	2.69%	2.28%	3%
a-Internet banking	1.40%	1.69%	1.98%	2%	2.20%	2.69%	2.28%	3%
b-Telephone banking								
c-Other								
Card payments	4.60%	0.11%	5.85%	0%	7.15%	0.22%	8.52%	0%
1- Payment by cards with debit function	2.97%	0.05%	3.67%	0%	4.37%	0.09%	5.21%	0%
2- Payment by cards with credit function	1.64%	0.06%	2.18%	0%	2.78%	0.13%	3.31%	0%
Direct debit	5.53%	0.49%	10.94%	2%	10.84%	3.55%	10.36%	2%
Cheques	1.56%	1.44%	1.06%	2%	0.93%	1.99%	0.79%	2%

Source: Bank of Albania, Authors own calculations

The figures for the period from 2008 to H1 2011 show that the share of card payments against the total customer payments has reflected an increasing pace. Additionally, by analyzing the composition of e-payments (Graph 3) it results that 31% - 40% of payments are made through cards, reflecting the relatively high importance of card payments against the total of e-payments.

The above analyses show some moderate progress in payment means in the Albanian economy. However, as shown in Graphs 1 and 2, the level of cash in circulation in the Albanian market remains one of the highest of when compared to other European countries (even when compared to the regional ones).



Guadamillas (2008) and Oviedo (2009) explain that high level of informality in the market is not only related to the socio-economic consequences of a typical informal market, it also becomes a barrier for a well-functioning market (in exchanging goods and services) in a more and more globalized world economy. Thus, in recent years, academics are increasingly paying more attention on consumers' choice behaviour and decision making process on payment instruments. Their main objective is to figure out what consumers' characteristics influence the decision-making on payment instruments. The next section of this paper deals with the conducted survey by Bank of Albania, data characteristics, the applied model for evaluating the data and results of the model.

3. DATASET AND SAMPLE'S DESCRIPTIVE STATISTICS

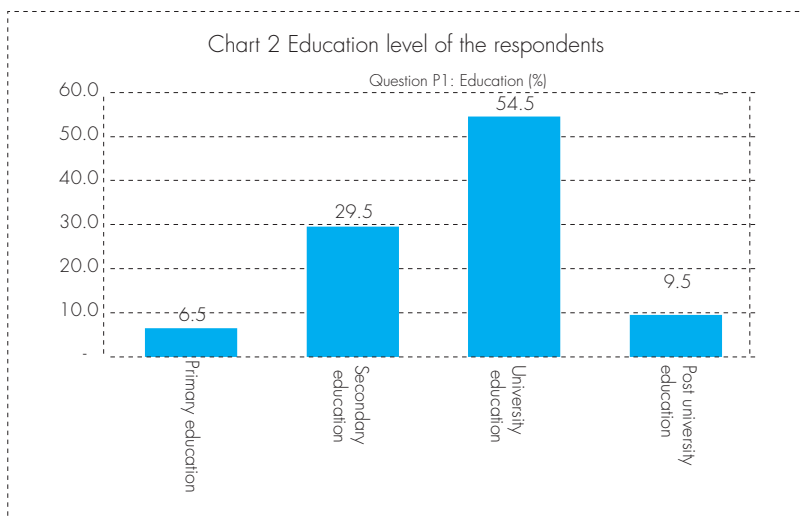
Bank of Albania possesses a rich and detailed database on electronic transactions and developments in payment instruments in Albania, as shown in Table 1 and Graph 3. However, these statistical databases cannot answer the hypothesis question: "What determines consumers' choices on payment instruments and how these choices can be oriented toward more efficient instruments?". The consulted international literature on consumer choice behavior (on payment instruments) suggests that the most used method in evaluating such consumer behavior phenomenon is by conducting primary research. In order to answer the above hypothesis a public survey was conducted in February – March 2012. The conceptual public survey was adapted to the Albanian market based on the study conducted by Jonker (2005) who studies Dutch consumers' behavior on payment instruments.

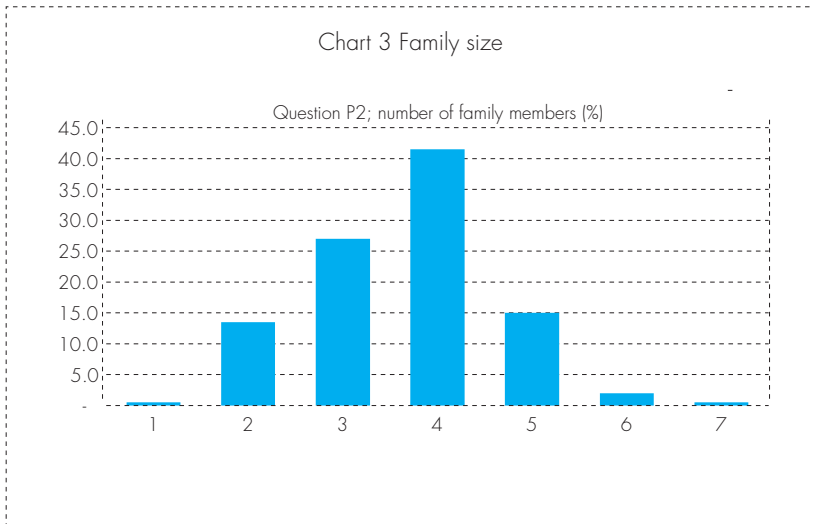
In their analysis Ceca, Pllaha and Semi (2013) suggest that: cash is the payment instrument mostly used by Albanian consumers (as expected). On the other hand "debit card" is the most appreciated payment instrument (in terms of Safety, Speed, Ease of use and Costs) amongst all seven payment instruments taken into consideration. Among other things, their study raises the hypothesis that Albanian consumers from different socio-demographic backgrounds differ also in their payment choice behavior. The following paragraphs of this section offer some detailed information on the descriptive statistics of the sample. These descriptive statistics would be applied next to the Probit model as explanatory variables on the usage of different payment instruments.

Section A of the questionnaire asked respondents to specify some of their socio-demographic characteristics. Some of these descriptive statistics would be used in the following sections to explain consumers' choice behaviour on the usage of payment instruments. The following part of this section offers an overview on some of the demographic characteristics of the respondents.

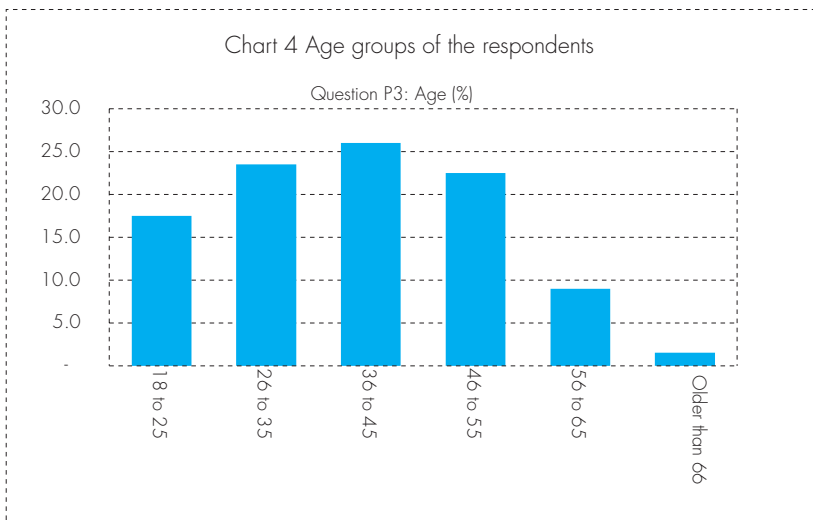
The number of valid respondents answering the questionnaire was 200, out of whom 99 female respondents and 101 male respondents.

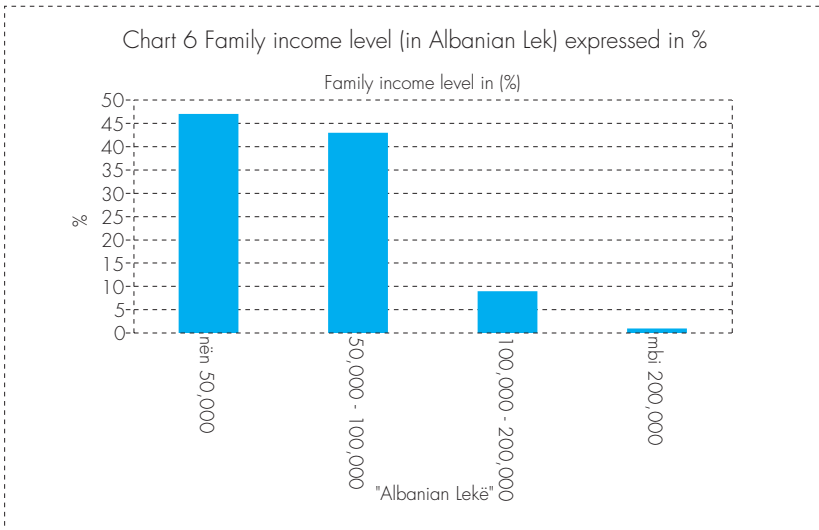
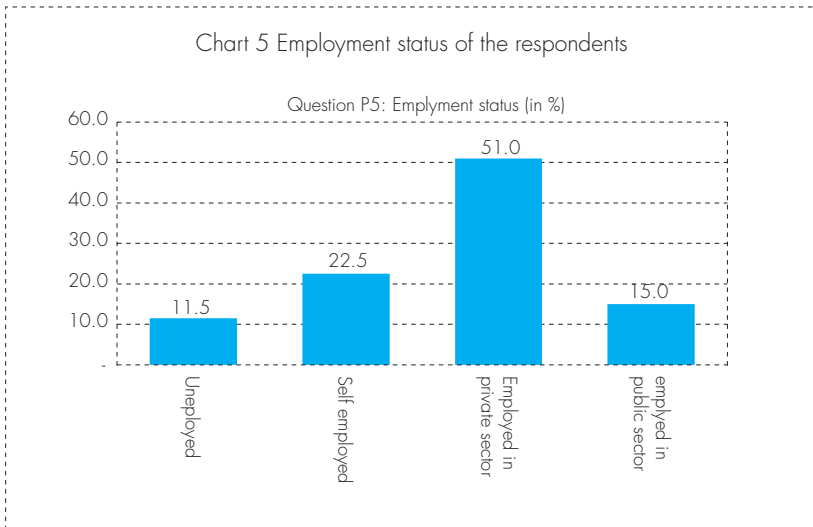
Graph 4 shows the level of education of the respondents. About 6.5% of the respondents have a primary education, 29.5% of them secondary education, 54.5% a university education and 9.5% of them have a post university qualification. In general the data are in line with the education level of the Albanian population, apart from the level of University Education which is a bit higher. This could be explained by the fact that most of the interviews were held in an urban environment, in where the level of university educated people is higher than in rural areas (Census 2011, INSTAT). Families with 4 members are the most common family type, counting for about 41.5% of the sample group, followed by families of three and five members counting respectively for 27 and 15% of the sample size.





Graphs 6, 7 and 8 are also offering some more, self-explanatory, descriptive statistics of the sample.





In general the socio-demographic statistics of the sample fit well with the socio-demographic statistics of the Albanian population (release of INSTAT, Survey on households' budget 2006-2007 and Census 2011, INSTAT). Even though some of the outcomes could be slightly diverged from the exact percentage of the actual population (like the case with university education) which could be explained by the relatively small sample size. However, the objective

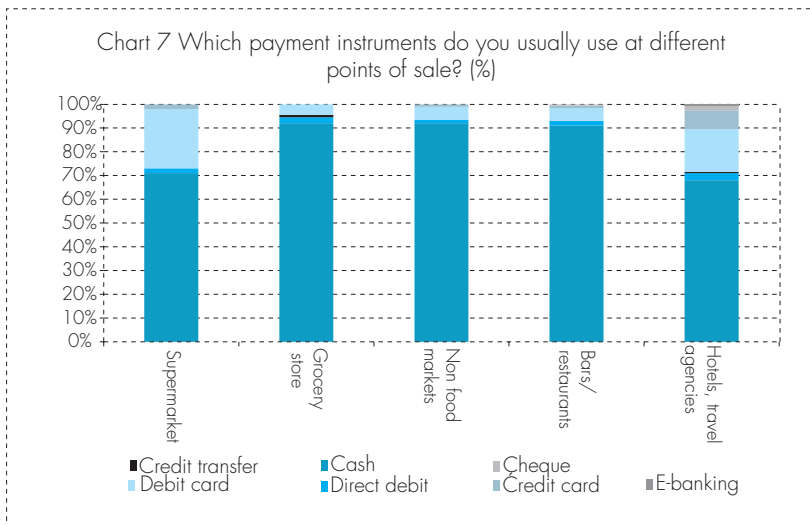
of this paper is to capture trends and tendencies of consumers on payment instruments, rather than measuring statistical errors (please refer to Ceca, Pllaha and Semi 2013 for more detailed analysis).

4. CONSUMERS' CHOICES BEHAVIOR ON PAYMENT INSTRUMENTS

Scholars believe that consumers' choice behaviour on payment instruments is influenced by several specific consumers' characteristics (see Kalckreuth, Schmidt & Stix, 2009; and Arango, Huynh & Sabetti 2011). Ceca, Pllaha and Semi (2013) provide two independent full reports on the surveys (Survey period: February - March, 2012) of use of payments by Albanian consumers' and businesses. Please refer to these two reports for more detailed information on the statistical and descriptive outcomes. Next are shown some of the results from the Albanian consumers' on payment instruments behaviour.

4.1. CONSUMERS' HABITS AT DIFFERENT POS

To observe consumers' habits on payment choice behaviour at different points of sales, we designed a question in the survey that intends to find out which routine reasons (habits) influence consumers in choosing specific payment instruments at six different POS. The specific question asked the respondents



the following: "Which of payment instruments do you usually use at following points of sale?". Graph 9 shows the respondents' answers to this question. As it was expected the majority of consumers' are used to pay "cash" at all the six different POSs. The POS situations where consumers are less used to pay "cash" are the category "Hotels & Travel Agencies", where about 32% of the respondents usually pay by other payment instruments (rather than "cash"). "Debit cards" and "credit cards" are the most frequently used payment instruments buy consumers in these POS situations with 18 and 8% respectively. Consumers' habits are to use "debit card" as a payment mean in "supermarkets" (about 25% of them are used to pay by debit card in supermarkets). The rest of the other POS categories (Grocery stores, Non-food markets, Bars/restaurants) are mostly dominated by the habit of paying in "cash". More than 90% of the respondents indicate that they are used to pay in cash in these POS situations, followed by the usage of "debit cards". The rest of the payment instruments are insignificantly a habitual practice of payment for the majority of the respondents.

Respondents were also asked to reveal their reasons for choosing a specific payment instrument at a specific POS. Table 2 shows

the two most mentioned reasons³. As indicated above most of the reasons were given about the usage of cash at different POS terminals, as this is the instrument used most frequently by the consumers interviewed. The rest of the respondents, on the other hand, also provided reasons for preferring a specific payment instruments at different POS situations.

The summary of the reasons in Table 2 reveals some interesting outcomes. The most obvious overall conclusion that can be underlined by analyzing Table 2, is the fact that the most stated reason for preferring whichever payment instrument is the perceived "Practical/Easiness to be used" element. It seems that the majority of consumers prefer payment instruments that are practical and easy to be used.

Regardless of the POS situation the two most mentioned reasons for paying in cash are: "Practical/Easy to use" and "Quickest". It is obvious that consumers whom prefer cash payments perceive this paying instrument as very practical (they feel that cash usage is quite easy) and they also perceive cash as being the quickest method. This indicates that the majority of the respondents perceive the rest of payment instruments (noncash payments) as not-quick methods of payment, as well as not very practical.

An additional interesting indication can be noticed when analyzing the main reasons for preferring the usage of debit card as a payment instrument. It is clear that one of the two most important reasons for preferring debit card payments is the perceived security they offer. In 4 out of 6 different POS situations perceived security is one of the two most stated reasons for preferring debit card as a payment method. On the other hand, when analyzing reasons for preferring credit cards as a payment instrument, it can be noticed that one reason why consumers prefer to use this payment instrument is to avoid tips in Bars/Restaurants, Hotels and travel agencies.

Reasons given for the rest of the payment instruments fall mostly under the perceived "Practical/Easy to use" or are spread in different reasons given which do not offer a specific outcome.

³ Answers have been grouped/organized in a logical manner into more concise defined reasons, as the given reasons are in an open question format.

Table 2. Reasons influencing consumers to use a specific payment instrument at different POS situations

	1. Cash	2. Direct debit	3. Credit transfer	4. Debit card	5. Credit card	6. Cheque	7. E-banking
Supermarket	Practical/ Easy to use	Practical/ Easy to use	2	More security	More security	2	
	Quickest	No other payment instrument accepted	1	Practical/ Easy to use	Practical/ Easy to use	2	
Grocery stores	Practical/ Easy to use	Practical/ Easy to use	3	Practical/ Easy to use			
	Quickest	No other payment instrument accepted	1	More security	1		
Nonfood markets	Practical/ Easy to use	Practical/ Easy to use	2	Practical/ Easy to use	Practical/ Easy to use	1	
	Quickest	No other payment instrument accepted	1	There is a POS	3		
Bars/ restaurants	Practical/ Easy to use	Practical/ Easy to use	3	Practical/ Easy to use	Practical/ Easy to use	2	Extra option
	There is no POS	No other payment instrument accepted	1				
Hotels, travel agencies	Practical/ Easy to use	Practical/ Easy to use	3	Practical/ Easy to use	Practical/ Easy to use	7	Practical
	Quickest	More secure	1	More security	To avoid tips	5	I do my own bookings
Online shopping				Practical/ Easy to use	Practical/ Easy to use	7	Quickest
			More secure	1	More security	3	Easy to use

4.1 CONSUMERS' EVALUATIONS ON PAYMENT INSTRUMENTS

Consumers were asked to express their appraisal for each payment instrument taken into consideration in the survey. Respondents are asked in this question to grade from 1 (minimum) - consumer's low interest/appreciation, to 7 (maximum) - consumer's high interest/appreciation, for each of the mentioned payment instruments, in terms of: Safety, Speed, Ease of use, Additional cost applied to the use of the specific instrument. The following graphs show consumers evaluations for each of the payment instruments:

Table 3. Consumers evaluation for payment instruments

	Security		Speed		Easy to use		Cost efficient	
	Average rate	Dispersion	Average rate	Dispersion	Average rate	Dispersion	Average rate	Dispersion
Cash	4.5	2.8	5.5	2.1	5.5	1.9	4.5	2.5
Direct debit	5.2	1.8	5.1	1.8	5.1	1.6	4.2	2.2
Paper format credit transfer	4.8	1.9	4.5	1.8	4.6	1.6	3.8	1.7
Debit card	5.9	1.4	5.9	1.5	6	1.4	4.6	2.2
Credit card	5.6	1.7	5.8	1.5	5.7	1.5	4	2.2
Cheque	4.5	2.3	4.5	1.8	4.6	1.8	3.7	1.3
E-banking	4.8	2.7	5.2	2.8	4.6	3.1	3.7	2

Table 3 indicates the average rates of respondents' evaluations for every payment instrument taken into consideration. Averages above grade 4 indicate a general positive appraisal whereas averages below 4 indicate the opposite.

Among all seven payment instruments, taken into consideration, "Debit cards" appear to be the payment instrument mostly appreciated by consumers. It seems that Albanian consumers perceive debit cards as being the most secure (average grade 5.9), the quickest (average grade 5.9), easiest to use (6.0) and the most cost efficient (4.6).

An interesting observation from Table 3 is the fact that, even though cash is the mostly used instrument by Albanian consumers, it appears that their appraisal for cash is the lowest (average grade 4.5) among all other payment instruments in terms of security. Cash is perceived as less secured compared to the usage of other payment instruments. This indication provides a great tool for market players interested in reducing cash in circulation. Consumers' low appreciation for the security offered by cash could be used to orient consumers toward more secured payment instruments.

In general Table 3 shows that most payment instruments are perceived positively (above 4 the neutral range) by Albanian consumers in terms of security offered, speed of transaction and easiness of use. However, three out of seven payment instruments (credit transfer-paper format, cheque and e-banking) are perceived as being non-costly efficient.

Respondents who gave minimum rating of appreciation to different payment instruments (rates of 1 or 2) were asked to support their low appraisal with a valid reason/argument. The most noticeable reason for the majority of the payment instruments (apart from cash) is the fact that many consumers associate the usage of these payment instruments with additional cost. This indication suggests that somehow non-cash payment instruments are perceived as more costly than cash by Albanian consumers. This statement might not be necessarily true. However, it is their perception that non-cash transactions are more expensive to be used than cash.

By possessing better knowledge about consumers' perceptions, market players can do a better job in informing consumers about real costs of using non-cash transactions and beneficiaries of paying by these payment instruments. In addition, a considerable part of respondents consider the usage of cash as being unsafe. This perception may be used as a worth argument in campaigning the reduction of cash and promote the use of other payment instruments.

5. CONSUMERS' CHARACTERISTICS ROLE ON PAYMENT INSTRUMENTS USE – PROBIT MODEL RESULTS

The previous sections emphasized some interesting results on consumers' preferences/habits on payment instrument selections at different POS situations. It also underlined their reasons for preferring a specific payment instrument at different POS. Section 4.2 exposed respondents' perceived appraisals for all seven payment instrument taken into consideration. In their full report ("Survey report on the use of payment instruments – individuals") Ceca, Pllaha and Semi (2013) reveal several more interesting conclusions on the usage of payment instruments by Albanian consumers. This section of the paper aims to provide empirical evidences on whether or not respondents' socio-demographic characteristics influence their payment behavior habits, in terms of statistical importance.

5.1. MODEL SPECIFICATION

The data used in this material are provided by a public survey on the usage of payment instruments by Albanian consumers conducted by Bank of Albania in March – April 2012. The consulted literatures, in theoretical and applicable terms, indicate that binary dependent variable models are the most suitable models in evaluating survey datasets. Probit models were initially introduced by Chester Bliss in 1934. Probit models are regression models where the dependent variable can only take two possible values (for example the dependent variable can only be either 1 or 0). The logic behind these models is the following: the dependent variable y might represent the occurrence of a certain event. In our case the dependent variable would represent the belonging or not to any of the following payers group: frequent cash payers, frequent direct debit payers, frequent credit transfer payers, frequent debit card payers, frequent credit card payers, frequent cheque payers and frequent e-banking payers. The incidence or not of the event (for example being a frequent credit card payer) is represented from the dummy values of 1 = if the event occurs (belonging to the group of

frequent credit card payers) or 0 = if the event does not occur (not belonging to the group of frequent credit card payers). Individuals (survey respondents in our case) are characterized by different socio-demographic characteristics such as level of education, income, race, marital status, etc. These individuals' characteristics are denoted by x in a binary dependent variable model. The aim is to quantify the relationship between individuals' characteristics and the probability of passing the exam. A simple linear regression of y on x is not appropriate, since among other things, the implied model of the conditional mean places inappropriate restrictions on the residuals of the model. Furthermore, the fitted value of y from a simple linear regression is not restricted to lie between zero and one (see Greene, 2008 for more technical explanations on discrete and limited dependent variable models).

To specify the above reasoning the model specification can take the following form:

$$P(Y=1|X) = \Phi(X'\beta),$$

where: P denotes probability, whereas Φ is the Cumulative Distribution Function (CDF) of the standard normal distribution. The β parameters are typically estimated by the maximum likelihood method. It is possible to motivate the Probit model as a latent variable model. Suppose there exists an auxiliary random variable:

$$Y^* = X'\beta + \varepsilon,$$

where $\varepsilon \sim N(0, 1)$. Then Y can be viewed as an indicator for whether this latent variable is positive:

$$Y = \begin{cases} 1, & \text{if } Y^* > 0 \text{ i.e. } -\varepsilon < X'\beta \\ 0, & \text{otherwise} \end{cases}$$

In this example, the threshold is set to zero – but the choice of a threshold value is irrelevant as long as a constant term is included in x_i .

The use of the standard normal distribution causes no loss of generality compared with using an arbitrary mean and standard deviation because adding a fixed amount to the mean can be compensated by subtracting the same amount from the intercept and multiplying the standard deviation by a fixed amount can be compensated by multiplying the weights by the same amount.

To see that the two models are equivalent, note that:

$$\begin{aligned}
 P(Y = 1|X) &= P(Y^* > 0) = P(X'\beta + \varepsilon > 0) \\
 &= P(\varepsilon > -X'\beta) \\
 &= P(\varepsilon < X'\beta) \quad (\text{by the symmetry of the normal distribution}) \\
 &= \Phi(X'\beta)
 \end{aligned}$$

5.1 PROBIT MODEL RESULTS

This section of the paper aims to evidence which consumers' personal characteristics collected by the survey on the usage of payment instruments by Albanian consumers in March – April 2012, influence individuals payment habits at different POS situations. The implementation of the Probit Model, discussed in the previous section, seeks empirical evidences on the relationship between the descriptive statistics x variables (education, family size, age, gender, employment status, family income level) and the probability of choosing a specific payment instrument at a specific POS situation (the dependent variable y). Six different (most common) POS situations were taken into consideration, namely: Supermarkets, Grocery stores, Non-food markets, Bars/restaurants, Hotels, Travel agencies and Online shopping. Section 4.1 discussed consumers' habit in using payment instruments. Seven different groups of payers were differentiated: a) frequent cash payers, b) frequent direct debit payers, c) frequent credit transfer payers, d) frequent debit card payers, e) frequent credit card payers, f) frequent cheque payers and g) frequent e-banking payers. Following the example of Jonker (2005) the thresholds for falling into a payers group or another were

chosen in such a way that belonging to the group is not 'forced' (think of POS situations with only one accepted payment instrument) and is neither extremely rare (high threshold) nor very ordinary (low threshold)". Following the above logic, the thresholds for belonging to the seven payers group were created with the following logic: Graph 9 showed that most Albanian consumers are used to pay cash at most POS, thus, a frequent cash payer would be a person who pays electronically at most in one POS situation. Respondents belonging to the direct debit payers group would be the ones who use direct debit as a payment instrument at least at two different POS situations. The same threshold (using a payment instrument at least 2 payment situations) is applied for the rest of the five remaining payment instruments. Following the above reasoning the dependent variable will be 1 if the consumer belongs to a certain group of payers and 0 if otherwise. Respondents might fall under one, more than one or none of the frequent payers' groups.

Several diagnostics tests are undertaken in order to check the robustness of the model and the credibility of the data. Therefore, the "Goodness-of-Fit" test was applied to check for the differences between the fitted expected values and the actual values (in aggregated terms)⁴. Using, EViews 6, two different goodness-of-fit tests were applied (Hosmer-Lemeshow, 1989 and Andrews 1988a, 1988b) in checking the robustness of the data. The logic behind these tests is to compare the differences between the fitted expected values and the actual values in aggregated terms. "Large" differences between these values indicate an insufficient fit to the data, leading thus to a rejection of the model. Tests' results reveal satisfying results (with small differences between fitted expected values and actual values) for most of the equations, fulfilling thus the required diagnostics in concluding that the model is rightly specified. Table 6 in the annex section offers the "Goodness of Fit Test" for the frequent cash users' equation. Whereas, Table 7 (in the annex section) reveals a summary of the "Goodness of Fit Test" for all the seven equations taken into consideration in this paper. The above diagnostics:

⁴ This test is known also as "Pearson's chi square test (goodness of fit)"

Table 5 Probit results on frequent buyers groups

	Cash	Direct debit	Credit transfer	Debit card	Credit card	Cheque	E-banking
Education	-0.409***	0.322*	0.449*	0.345**	0.397***	-0.154	0.501
Family size	-0.050	0.050	0.036	-0.026	-0.071	-0.023	-0.217*
Age	-0.117	0.062	0.362*	0.085	-0.112	0.138	-0.033
Gender	0.157	-0.896***	0.394	0.102	-0.525**	0.597	-0.421
Employment status	0.074	0.207	-0.606***	-0.204	0.165	0.210**	0.240
Income	-0.117	-0.286*	-0.225	0.251*	0.082	0.321	0.614***
No. of Observations	200	200	200	200	200	200	200
Obs with Dep=1	152	12	6	34	26	5	8
Convergence achieved after	4 iterations	5 iterations	5 iterations	5 iterations	5 iterations	6 iterations	6 iterations
McFadden R ²	0.045	0.119	0.219	0.052	0.090	0.077	0.221
Log Likelihood	-105.20	-39.97	-21.02	-86.41	-70.25	-21.56	-26.14

* indicates statistical significances at 10 %,

** indicates statistical significances at 5 %

*** indicates statistical significances at 1 %

Coefficients marked with “*” reveal statistically important coefficients. Next are analyzed some of the interesting results from Table 5. It is important to predefine that in probit models the “interpretation of the coefficient values is complicated by the fact that estimated coefficients from a binary model cannot be interpreted as the marginal effect on the dependent variable. A positive value of β_i implies that increasing x_i will increase the probability of the response, negative values imply the opposite. Therefore, a general overview on Table 5 shows that education and income level are the two most influential socio-demographic characteristics affecting payers’ groups’ behavior.

Nevertheless, next are discussed all significant coefficients for every payers group:

For consumers falling under the group of cash payers the level of education is characterized by a negative statistically important coefficient. According to Probit model theory this indicates that regardless of their educational level, Albanian consumers are used to pay cash. In other words an increase in consumers’ educational level will not reduce the usage of cash at different POS situations.

Direct debit payers group: Table 5 indicates that this group of payers is positively influenced by the level of education. Thus, by increasing respondents' level of education increases the probability that they will use direct debit as a payment instrument. In contrast, gender (male or female) seems not to play a crucial role on whether they use direct debit or not. So, whether being a male or a female does not increase the probability of using direct debit. The same could be stated about income level: increasing the family income level does not increase the possibility of using direct debit as a favorite payment instrument.

Credit transfer payers are positively influenced by educational level and age group, so the more educated and the older the age of the respondents the more chances there are to use credit transfer as a payment instrument. On the other hand, employment status does not increase the probability of using credit transfer as a payment instrument.

Debit card payers are positively affected by their educational and income level. Thus, an increase of educational and income level of the consumers increases the chances they will use debit card as their favorite payment instrument at different POSs.

Educational level seems to again represent an important socio-demographic characteristic influencing consumers' paying behavior in case of credit cards. Again increasing educational level raises the probability that a respondent will preferably use credit cards as his/her favorite payment instrument. On the opposite, gender (whether male or female) does not influence respondents' credit card usage.

Respondents using cheque as their preferred payment instrument seem to be positively affected by their employment status. Employed consumers are more likely to use cheques than unemployed ones.

Consumers using e-banking as their preferred payment instruments seem to be positively affected by their family income

level. An increase in families' income level increases the probability in belonging to the e-banking payers' group. On the other hand belonging to different family sizes does not increase the chances of belonging to the e-banking payers' group.

6. CONCLUSIONS

Micro data, drawn from the public survey carried out by Bank of Albania (March – April 2012) on the usage of payment instruments by Albanian consumers, were applied in a Binary Dependent Variable Model (Probit Model) aiming to identify whether or not socio-demographic characteristics influence consumers' choices on payment instruments. Using the maximum likelihood method we estimate whether or not interviewees' socio-demographic characteristics play a role on the probability of belonging any of the following frequent payers' groups: cash, direct debit, credit transfer, debit card, credit card, cheque and e-banking payers. Probit model results reveal the following summarized statistically important outcomes:

- Education and level of income are the two socio-demographic characteristics mostly affecting consumers' behaviour on choosing among payment instruments.
- Albanian consumers are used to pay cash regardless of their educational level. In other words an increase in consumers' educational level does not reduce the usage of cash at different POS situations.
- Direct debit, Credit transfer, Debit card and Credit card payers are positively affected by their level of education. By increasing the level of education increases the probability that consumers will use any of the above non-cash payment instruments.
- In contrast socio-demographic characteristics such as gender and family size seem to not play a crucial role on whether consumers will prefer using electronic payment instruments or not.

In addition consumers' statements reveal that the two most mentioned reasons for paying in cash are: "Practicality/Easiness

of use" and "Quickest". This suggests that providers of payment instruments could improve the usage of electronic payment instruments by improving their perceived practicality or perceived quickness of usage.

Even though cash is the mostly used payment instrument by Albanian consumers, their appraisal for cash is the lowest (average grade 4.5) among all other payment instruments in terms of security. This perceived "weakness" of cash could be used by market players to promote alternative (more secure) payment instruments.

To summarize the above conclusions the probit model results reconfirm (econometrically) Ceca, Pllaha and Semi's (2013) conclusions that socio-demographic characteristics such as education, income level and employment status do influence consumers' habits in using specific payment instruments. In addition, the above findings are in line with the findings of Junker (2005) whom also finds out that income level and education affect Dutch consumers' buying behavior. The above findings are also in line with the findings of Arango, Huynh & Sabetti (2011), who also suggest that consumers' socio-demographic characteristics play an important role in payment instruments usage.

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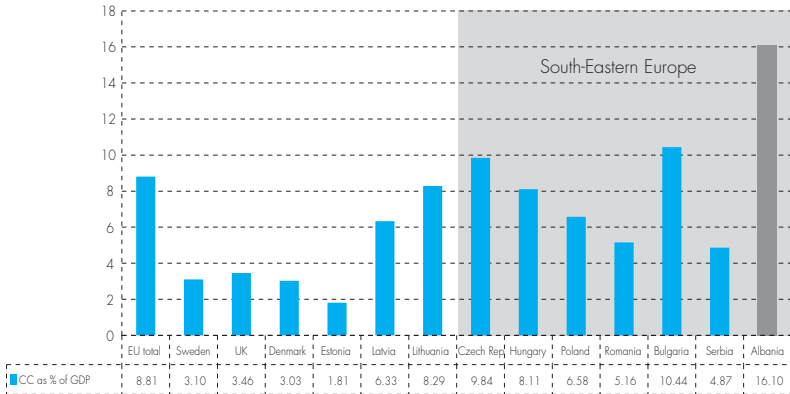
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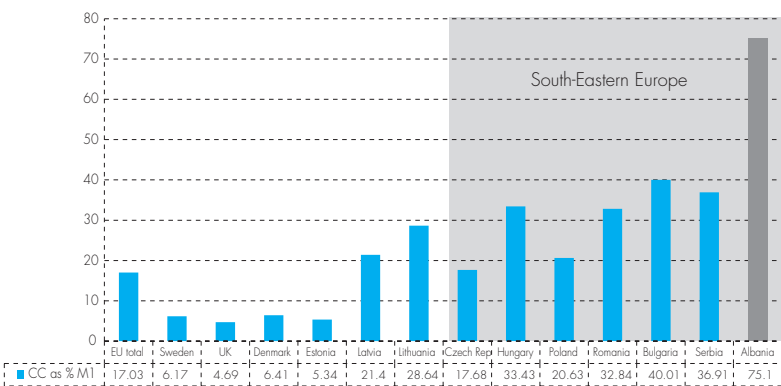
8. ANNEX

Chart 8 Level of cash in circulation as % of GDP, 2010



Source: European Central Bank (<http://sdw.ecb.europa.eu/reports.do?node=1000001964>) and respective central banks

Chart 9 Level of cash in circulation as % of M1, 2010



Source: European Central Bank (<http://sdw.ecb.europa.eu/reports.do?node=1000001964>) and respective central banks.

Table 6. Goodness of Fit Test for the Frequent Cash User Equation

Goodness-of-Fit Evaluation for Binary Specification								
Andrews and Hosmer-Lemeshow Tests								
Equation: EQ01FREQ_CASH								
Date: 11/22/13 Time: 16:15								
Grouping based upon predicted risk (randomize ties)								
	Quantile of Risk	Dep=0	Dep=1	Total	HL			
	Low	High	Actual	Expect	Actual	Expect	Obs	Value
1	0.4708	0.6406	7	8.25501	13	11.7450	20	0.32490
2	0.6406	0.6747	7	6.89621	13	13.1038	20	0.00238
3	0.6747	0.7120	5	6.09935	15	13.9007	20	0.28509
4	0.7120	0.7368	10	5.47190	10	14.5281	20	5.15839
5	0.7378	0.7671	5	4.90870	15	15.0913	20	0.00225
6	0.7712	0.7884	3	4.44228	17	15.5577	20	0.60197
7	0.7885	0.8193	1	3.98518	19	16.0148	20	2.79255
8	0.8206	0.8459	7	3.31443	13	16.6856	20	4.91234
9	0.8515	0.8736	2	2.78148	18	17.2185	20	0.25503
10	0.8759	0.9502	1	1.82488	19	18.1751	20	0.41030
		Total	48	47.9794	152	152.021	200	14.7452
HL Statistic	14.7452		Prob. Chi-Sq(8)	0.0643				
Andrews Statistic	20.6508		Prob. Chi-Sq(10)	0.0237				

Table 7 Goodness of Fit Tests of the 7 equations

Equation	Dependent variable=0		Dependent variable=1		No of Observations Total Observations	Andrews Statistic	
	Actual (Total)	Expected (Total)	Actual (Total)	Expected (Total)			Prob. Chi-Sq(10)
Frequent Cash User	48	47.9794	152	152.021	200	20.6508	0.0237
Frequent Direct Debit User	188	188.013	12	11.9874	200	84.8648	0.0000
Frequent Credit transfer	194	194.029	6	5.97127	200	143.9564	0.0000
Frequent Debit Card User	166	165.977	34	34.0226	200	34.8089	0.0001
Frequent Credit Card User	174	173.965	26	26.0347	200	26.2500	0.0034
Frequent Cheque User	195	194.991	5	5.00864	200	122.6235	0.0000
Frequent E-banking User	192	191.997	8	8.00315	200	120.6729	0.0000

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*Bank of Albania
Sheshi “Skënderbej”, Nr.1, Tirana, Albania
Tel.: + 355 4 2419301/2/3; + 355 4 2419401/2/3
Fax: + 355 4 2419408*

or send an e-mail to:

public@bankofalbania.org

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