Socioeconomic Characterization and Equity Market Knowledge of the Citizens of Barranquilla, Colombia

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Abstract: *This paper empirically examines the level of knowledge and participation of the citizens of Barranquilla in regard to the equity market in Colombia. 800 individuals distributed in five locations within the city were surveyed for this study. The factors explaining the small investors' knowledge of the market, as well as the variables that influence the probability of investing in the stock exchange, were estimated using a logit model. The results show that, compared to other variables, the income range determines the level of knowledge and investment in the stock market to a great extent. Finally, it is confirmed that the equity market has very specific characteristics such that its main participants are those investors with greater knowledge about the investments they make.*

Keywords: *stock exchange, equity market knowledge, financial literacy, logit model*

JEL Classification: *C25, G1, G11, G15*

Caracterización socioeconómica y conocimiento del mercado bursátil de los ciudadanos de Barranquilla, Colombia

Resumen: *Este artículo examina empíricamente el grado de conocimiento y participación de los ciudadanos de Barranquilla en el mercado bursátil colombiano. Para ello, se encuestaron 800 individuos distribuidos en las cinco localidades de la ciudad. Utilizando un modelo logit, se estimaron los factores que explican el estado del conocimiento del mercado bursátil así como las variables que influyen en la probabilidad de inversión en la bolsa de valores. Se encuentra que el rango de ingresos determina en mayor medida el nivel de conocimiento e inversión en el mercado bursátil respecto al resto de variables. Finalmente, se confirma que se trata de un mercado de características muy específicas, en el cual participan principalmente aquellos inversionistas con mayor conocimiento de las inversiones que ponen en marcha.*

Palabras clave: *mercado de valores, conocimiento del mercado bursátil, educación financiera, modelo logit*

Clasificación JEL: *C25, G1, G11, G15*

Caractérisation socio-économique et connaissance du marché boursier par les citoyens de la ville de Barranquilla, Colombie

Résumé: *Cet article examine empiriquement le niveau de connaissance du fonctionnement du marché boursier colombien auprès des citoyens de Barranquilla, ainsi que leur participation dans celui-ci. Pour ce faire, nous avons interrogés 800 personnes réparties dans les cinq arrondissements de la ville. Ensuite, un modèle logit permet d'estimer les facteurs qui expliquent l'état des connaissances sur le marché boursier, ainsi que les variables qui influencent la probabilité d'investir dans ce marché. On constate que le revenu des individus détermine le niveau de connaissance et d'investissement dans le marché boursier, par rapport à d'autres variables qui ont été étudiées. Enfin, il est confirmé qu'il s'agit d'un marché avec des caractéristiques très particulières, dans lequel interviennent principalement les investisseurs qui ont une plus grande connaissance du marché.*

Mots-clés: *marché boursier, connaissance du marché boursier, éducation financière, modèle logit*

Classifcation JEL: *C25, G1, G11, G15*

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–Introduction. –I. Literature Review. –II. Methodology and Data. –III. Results analysis. –Conclusions. –Appendix. –References.

Introduction

The development of well-structured capital markets[1] has allowed the deepening and diversification of the financial system in developed and emerging countries. These markets are the funding source for the productive sector.

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[1] The capital market, the money market, the foreign exchange market, and other financial markets constitute the financial system in Colombia. Moreover, the capital market is divided in the banking market and the stock market. The stock market comprises the equity market (i.e., negotiations in the Colombia stock exchange, BVC for its initials in Spanish) and the over-the-counter market (outside BVC). The difference between knowledge of equity and over-the-counter markets is not distinguished for the purpose of this study. The equity market is addressed in general.

They offer investment options for savings and also provide mechanisms to diversify financial risk. In this regard, a greater extent of participation, segmentation and interaction of several agents enable the development of capital markets based on higher deepening and democratization. This is why many countries, including Colombia, have developed financial education programs to promote the knowledge and participation of citizens in the financial system, and particularly in the equity market. However, citizens' participation in this market has faced major delays because most of them do not know the basics of its operation, thus affecting the savings and investment trade off in the stock market.

The existing studies on this topic, which are few, show that financial illiteracy is generalized and individuals lack knowledge of even the most basic economic principles (Lusardi & Mitchell, 2007; Hilgert, Hogarth & Beverly, 2003). Furthermore, the extensive information and documentation available in Colombia in regard to the stock market contrasts with the scarce literature on knowledge of the equity market and its determinants. Ariza and Giraldo (2013) descriptively analyzed the stock market and suggested strategies to promote financial education at school as well as investment mechanisms for small and medium enterprises (SMEs) in this market. Among their findings, it is worth pointing out the savings deficit of the population in Colombia as a constraint to enter the stock market and shortcomings in the supply of products responding to the needs and expectations of the investors and businesses that require funding.

Moreover, Uribe (2007) highlighted the positive evolution of the Colombian stock market in the past years. This expansion was above the average of other markets in the region and has a growing tendency during the next decades. Despite these progresses, the Colombian market remains a highly concentrated and shallow one with respect to its regional peers.[2]

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[2] In countries such as Peru, Brazil and Chile, the stock market is deeper and has a relatively stable number of companies (between 200 and 350). This is in contrast with the markets of Argentina, Mexico and Colombia, which have fewer companies (between 80 and 200). Furthermore, the concentration level in the Colombian stock market increased 50.25% in the past years.

The majority of the activities carried out in the Colombian securities market are focused on the performance of products traded in the stock market and on the analysis of specific products using several assessment techniques. Evidence from empirical studies on citizens' knowledge about the equity market in Colombia is null; hence, this study significantly contributes to the literature since it characterizes the socioeconomic profile and identifies the knowledge level that citizens of the Colombian city of Barranquilla have in regard to the equity market,[3] as well as the factors that explain participation in this market. This study takes as reference the one developed by Van Rooij, Lusardi and Alessie (2011), and empirically analyzes the knowledge and understanding scales of the equity market using a binomial and ordinal logit model. The probability of investment is also assessed based on several variables such as income, education, savings, and social stratum, among others. This additional information allows characterizing the economic profile of the citizens of Barranquilla.

In order to achieve these objectives, this paper is structured as follows: The second section includes a theoretical review of the equity market and the factors that facilitate/inhibit its development in the national and international context. The third section sets forth the methodology used for the econometric estimation and the results. Finally, the conclusions are presented.

I. Literature Review

In developed countries, the increased interaction of economic agents with the capital market has contributed to its development and deepening. Part of

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[3] During the period 2000-2013 Barranquilla experienced an average growth rate of 4.2%, the highest within the Caribbean Region (Fundesarrollo, 2015). Last year, this city displayed one of the lowest unemployment rates in the country (8.6%) and an overall participation rate of 65.8% (DANE, technical bulletin, January 2016). The port, tourism, and the construction sector are important drivers of this growth. This economic expansion has also been boosted by large amounts of financial resources coming from external sources, such as the Inter-American Development Bank and other international institutions that support potential growth in Barranquilla. These conditions favor the dynamics of financial markets, which manifests in the existence of eight stockbroker companies in the city.

this interaction is a result of greater democratization and participation of several agents. Mohanty (2002) states that the expansion of the investor base has positive effects on stock market deepening by increasing its size, providing more liquidity and diversifying financial risk. Moreover, a large number of investors can encourage technological innovation, improve negotiation and transaction processes, and reduce costs. For this reason, small investors (citizens) find in this market an investment alternative through its several share options.[4]

Although higher saving rates favor such investment, the existence of financial education programs-that include the promotion of equity investment and financial literacy-is also essential (OCDE, 2005).[5] Some experiments carried out by financial literacy national programs in New Zealand and Australia show positive results between the population's level of financial knowledge and investment in the equity market. In general, the average citizen in these countries understands the basic concepts of risk, return, investment and diversification reasonably well (Ispierto & Oliver, 2011). However, limited participation of citizens in the equity market remains a predominant characteristic of global financial systems. Haliassos and Lyon (1994) show that less than 50% of households in the United States have stakes in the equity market, mostly concentrated in a financial product. Similarly, Attanasio, Banks and Tanner (2002) report that over 75% of households in the United Kingdom do not have direct investments in the equity market. These authors study the implications of limited participation in the asset and stock market, particularly using asset valuation models based on consumption Euler equations. Their results show a higher probability of having or investing on assets as individuals become elderly. Also, individuals manage to improve their level

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[4] In the USA, there are regional stock markets that allow small investors to negotiate with relatively low transaction costs. Examples of such stock markets are Chicago, Boston and Cincinnati.

[5] The OECD defines financial education as "the process by which financial consumers/investors improve their understanding of financial products, concepts and risks and, through information, instruction and/or objective advice, develop the skills and confidence to become more aware of financial risks and opportunities, to make informed choices, to know where to go for help, and to take other effective actions to improve their financial well-being" (p. 4)

of financial literacy in a temporary framework, although the positive effect of higher education tends to decrease over time for the stock market. In a study of income dynamics, Mankiw and Zeldes (1991) find that only a small proportion of households own stocks.

As for the factors that influence investment in the equity market, several studies have suggested that age, education, occupation, income and attitude toward risk play an important role as determinants of participation in the equity market (Sungur, 2003). Haliassos and Bertaut (1995) investigate a series of explanatory factors of financial education on the basis of the Survey of Consumer Finances and performed a logit estimation using 4,103 observations. Their results show that university education is more likely to influence the decision to invest in the stock market in contrast to those with lower educational level, who prefer savings deposits as an investment option.

Other studies have documented how individuals' financial decisions are significantly influenced by the absence of basic knowledge on finance. Bernheim and Garrett (2003) analyze the results of a financial survey conducted on US individuals from 30 to 48 years old and concluded that saving rates increased with the provision of financial education. Specifically, they find that the probability to participate in certain savings programs is higher for employees who are familiar with educational retirement programs in contrast with those who did not have any knowledge.

Bernheim, Garrett and Maki (2001) analyze the effects of financial education during school age on individual savings. The main conclusion is that education programs significantly increase the individuals' saving rates and the stock of wealth during adulthood. Lusardi and Mitchell (2007) analyze the level of financial literacy among individuals older than fifty years and find that financial knowledge is scarce. However, individuals with greater financial knowledge are more likely to invest in more sophisticated products such as stocks, bonds, mutual funds, among others. Similarly, their behaviors are more rational and planned when weighing the cost (commission)-benefit (return) ratio in their trading decisions.

The correlation between the equity market and the level of financial education analyzed by Van Rooij et al. (2011) exhibits particular behaviors, since

financial education and investment decisions differ substantially depending on the education, age and gender of individuals. This suggests that any program aiming for financial education would be more effective if it is oriented to specific groups of the population. Similarly, the lack of economic/financial knowledge decreases the probability to participate in the stock market.

Bucker-Koenen and Lusardi (2011) use instrumental variable methods to identify the causality direction based on questions that measure the previous financial concepts that individuals have before entering into the stock market. They conclude that financial knowledge has a positive and significant effect on financial decisions, and not vice versa.

Hilgert et al. (2003) use data from the monthly consumer survey conducted on consumers from the University of Michigan and noted that debt and credit management are correlated with individuals' financial knowledge. The results of this study demonstrate the existence of a positive correlation between household financial literacy and the stock of wealth. In turn, they find that the two basic channels that contribute to this positive relationship are that the provision of financial literacy favorably induces individuals to invest in equity securities, and that these individuals have a greater tendency to financially plan their retirement.

Moreover, the Economic and Financial Education (EFE) program implemented in several countries such as the United States, Australia, Brazil, Slovenia, Spain, Ghana, Holland, India, Ireland, Japan, Malaysia, New Zealand, Portugal, Czech Republic, United Kingdom, Canada, Chile, Estonia, Indonesia, Mexico, Peru, Poland, Romania, Turkey and South Africa, was replicated in Colombia in 2010 with the name of National Strategy for Economic and Financial Education (NSEFE). The Ministry of Finance and Public Credit, the Ministry of Education, the Central Bank, the Financial Superintendence of Colombia, the Guarantee Fund of Financial Institutions, and the Stock Market Self-Regulatory Organization assumed the leadership in this strategy. The purpose of this program is to provide the Colombian population with more and better tools to support decisions and improve financial expertise on issues related to personal and household finances. Complementing this initiative, Bill No. 082 in 2011 was submitted to the Colombian Congress

proposing the establishment of EFE services and consumer organizations across preschool, primary and secondary educational institutions in private and public entities all over the country. Moreover, the 2010-2014 National Development Plan determined the inclusion of EFE in the design of programs developing core competencies, in accordance with the provisions of Law No. 115 of 1994 (Quintero, 2014).

In the 1990s, the Central Bank started a program called "The Central Bank in the classrooms", which included campaigns aimed at promoting economic education in primary and secondary schools. The objective was to contribute through various activities and educational materials to the training of the future economically responsible citizens.

Similarly, Asobancaria, Fogafin and other entities maintain financial education programs as "Balance your pocket", "Do not be hardheaded", "Learn more, be more", "Heavyweights", "yodecidomibanco.com" in order to sensitize and financially educate the population. In addition to these initiatives, the national government issued Law 1328 in 2009, called "Financial Reform", which sets the parameters for the financial sector entities—supervised by the Financial Superintendence of Colombia—to provide financial education to its members (Gonzalez & Rojas, 2008).

As for participation of people and businesses in the Colombian stock market, lack of knowledge is the main cause of their backwardness in contrast with developed countries and several Asian and Latin American countries. Moreover, the creation of the Center for Capital Market Development failed to have an actual impact on its target audience (businesses and the general population).[6] This was evidenced on the lack of knowledge related to the functioning and importance of the capital market (Roncallo, 2009).

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[6] The Center was created in 1997 by the Colombia Stock Exchange, Universidad Javeriana, ICESI, Universidad del Valle, Universidad de San Buenaventura and the Chamber of Commerce of Cali. The objective was to contribute to the development of a culture of capital markets in Colombia and to develop strategies for training and disseminating the equity culture and investment and financing instruments, in addition to the promotion of research on issues related to capital markets and to act as a communication channel between the public and private sectors.

Similarly, Londoño and Londoño (2008) conduct a research on the market for financial products of small investors in the coffee sector. Their results show that small investors prefer low-risk alternatives, represented in portfolios that include savings accounts, term deposits, bonds, share repos, and public debt securities. This conservative attitude toward investment occurs due to the low level of knowledge and the lack of investment programs for this customer segment.

Vargas (2013) develops a study on how to promote stock market participation in social strata 2 and 3 in Bogotá. His study shows that there are educational, financial and personal barriers for its promotion. Lack of dissemination of the investment alternatives offered by the Colombian stock market largely explains the limited participation of investors from strata 2-3, in addition to lack of an equity market culture and high risk aversion. Despite this finding, the study reveals that most of the population of these strata has available resources to invest, since 91% of the surveyed population declared to have savings that range from $100,000 to $1,000,000.

Ariza and Giraldo (2013) descriptively analyze the stock market. They suggest strategies to promote financial education from school and propose investment mechanisms for SMEs in this market.

II. Methodology and Data

The empirical basis of this study comes from a survey conducted on the citizens of the district of Barranquilla during the second half of 2014. The sample consists of 800 individuals, which correspond to 0.057% of the population (1,386,865 inhabitants, according to the Colombian Statistics Department), selected via simple random sampling. With a significance level of 5%, a sample error of 3.71% and a response rate of 95%, the database is constructed with 697 final observations (103 are discarded due to statistical bias) distributed in the five areas of the city (105 South East, 105 South West, 233 North historic center, 172 Riomar and 82 metropolitan area).

For the empirical study, a questionnaire with specific and complementary information regarding the citizens' characteristics and their financial situation

was constructed. This instrument is divided into three sections and includes multiple-choice closed questions, as well as dichotomous, scalar and valuation questions. In the first section, the citizen's socio-demographic characteristics are explored. In the second section, we investigate their economic information and financial habits. In the third section, the level and the factors that favor or condition their ownership and knowledge of the Colombian equity market are analyzed.

A. Data analysis

Figure 1 shows some of the general characteristics of the sample. By sex, the sample included 56.53% of men and 43.47% of women; nearly half of the respondents are in the range of 18-35 years old. By socioeconomic status, socioeconomic stratum 2 has the highest share while the socioeconomic stratum 6 the lowest. By educational level, 38.31% of the sample holds a university degree, followed by 20.52% that are technicians or technologists, 17.52% with postgraduate training, and about 24% has secondary education or less.

Figure 1. *Socio-demographic characterization*
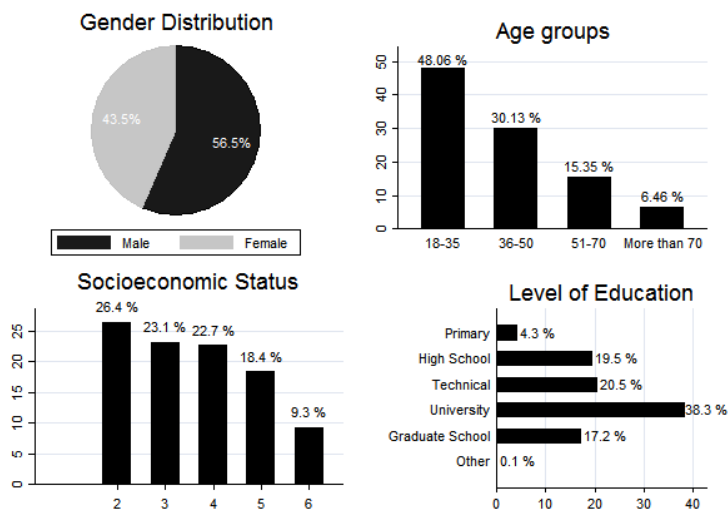
Source: authors' compilation.

Regarding the level of financial literacy, 52.7% of the respondents state that they do not have any knowledge of the equity market and its investment instruments (Figure 2), that is, 6 out of 10 respondents do not recognize that market. This lack of knowledge is accentuated when referring to specific funding instruments (70.47%). Additionally, only 16.5% is aware of the existence of the NSEFE.[7] In terms of gender, the data show a gender gap in terms of lack of knowledge in regard to the equity market: 63% for women and 37% for men. Moreover, a direct relation is shown between knowledge of the equity market and respondents' education level. This relation is closer when the knowledge level of the equity market and the proportion of people who have a stake in the equity market are examined (Figure 3).

Figure 2. *Knowledge of the equity market by gender and education level*
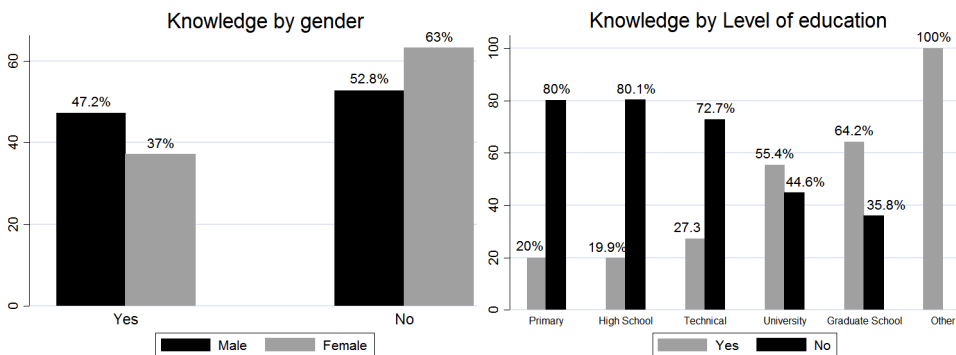
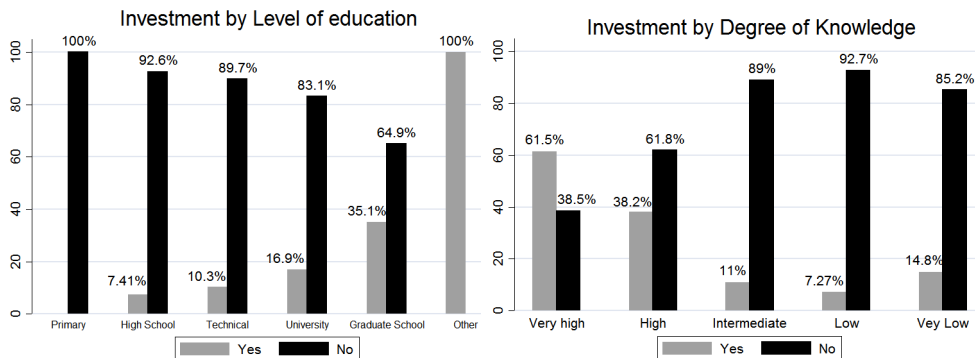

Source: authors' compilation.

Econometric estimations are carried out in order to confirm the information provided by the data at a descriptive level. These estimations allow examining the relations and correlations of the main variables of analysis.

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[7] The EFE is a "tool used to encourage the needed competencies for the economic literacy and social integration..." "...It requires a connection with formal education; it is strengthened with education programs for work and human development, and it should be integrated with the public and private institutions work in relation to tax, pension, commercial and legal fields." (Ministry of Finance and Public Credit et al., 2010, p. 13)

B. Econometric strategy

To examine the factors that influence the knowledge and participation of Barranquilla's private investors in the equity market, we proceed to run two discrete choice models (ordered and binary logit) in order to analyze: (i) The variables that influence individuals' knowledge of the equity market; and (ii) the variables that influence the likelihood of investing in the Colombia Stock Exchange (BVC).

Figure 3. *Investment in the Colombia Stock Exchange according to levels of education and equity market knowledge*

Source: authors' compilation.

The first step was to estimate the determinants of individuals' level of knowledge of the BVC. The respondents were asked to perform a self-assessment of their knowledge level of the equity market in order to quantify this variable. A Likert scale from 1 to 5 was used to rate if an individual's knowledge was null, low, average, high or very high. Since the values of the outcome variable are ordinal in nature and, therefore, it is not possible to ascertain the cardinal distance between each of the possible outcomes, the dependent variable L (knowledge level) takes N categories of ln responses, where $n = 1, \ldots, N$, arranged as follows:

$$l_1 < l_2 < \cdots < l_N. \tag{1}$$

According to Miranda and Rabe-Hesketh (2006), the latent response variable l_i^* for the i-th individual is determined according to the following equation:

$$l_i^* = x_i'\beta + \lambda\varepsilon_i + \tau_i \; (1),$$

(2)

where x_i represents a vector of explanatory variables and λ, ε_i and τ_i represent a load factor, a heterogeneity term and a random error, respectively. The constant term is replaced by the thresholds that determine the change of the observed responses from one category to another:

$$l_i \begin{cases} 1 & \text{if} -\infty < l_i^* < k_1 \\ 2 & \text{if} k_1 < l_i^* < k_2 \\ 3 & \text{if} k_2 < l_i^* < k_3 \\ 4 & \text{if} k_3 < l_i^* < \infty, \end{cases}$$

(3)

where k_s, with $s = 1 \ldots N - 1$, represents the parameter corresponding to the several thresholds. This is a latent variable that is only observable for those citizens who claim to have knowledge of the Colombian equity market and assign a value to that knowledge.

Once the variables that have influence on the knowledge level of the equity market are identified, the next step is to ascertain the influence that this knowledge has on investment in the BVC. To do this, a logit model was estimated due to the binary nature of the dependent variable (Greene, 2003), examining the probability of occurrence of one event for each of the independent variables that comprise it.

According to Long and Freese (2006), the logit model can be expressed in probabilistic terms, where predicting the probability of occurrence an event Y given X, is $Pr(y = 1 \mid x)$. To restrict probability predictions to that range, the linear probability model might be:

$$Pr(y = 1 \mid x) = x\beta + \varepsilon,$$

(4)

where vector x denote the observed independent variables and ε is the random error term.

Firstly, the probability is transformed into the ratios

$$\Omega\left(x\right) = \frac{Pr(y=1\mid x)}{Pr(y=0\mid x)} = \frac{Pr(y=1\mid x)}{1 - Pr(y=1\mid x)}. \qquad (5)$$

This formulation indicates the occurrence frequency of an event $(y = 1)$ with respect to non-occurrence $(y = 0)$. The ratios log or logit is within the range of $-\infty$ to ∞, and it assumes the linear logit form, which interpretation is frequently focused on changes in probability ratios:

$$\ln\Omega\left(x\right) = x\beta. \qquad (6)$$

Since the independent variable, knowledge level of the equity market, responds to a self-assessment scale, this variable could be censured to the extent that individuals have an anecdotal knowledge of the market or they do not recognize their notions about the equity market as such. This could mean that only those with formal training or experience in the equity market claim to have high or very high levels of knowledge. Similar to Polder et al. (2009), it is proposed to use predictions obtained from the ordered logit model described above instead of the knowledge level of the equity market variable in order to mitigate this selection bias.

III. Results analysis

A. Determinants of knowledge of the Colombian equity market

The results confirm to a great extent the information showed by the descriptive data. First, the estimates of the ordered logit model shown in Table 1 allow us to observe that older people have more knowledge of the Colombian equity market. Also, the fact of having completed postgraduate studies positively influences the knowledge of this market. However, as already evidenced in previous studies (Van Rooij et al., 2011), to have specific knowledge of that market is more important than the level of education *per se*. In this study, knowledge was measured by using a variable that indicated the scientific field of studies undertaken by the respondent. In this case, it is possible

to approximate it by the sector in which the respondent performs. Specifically, working in the financial sector has a statistically significant influence on knowledge of the equity market.

Table 1. *Ordered Probit. Knowledge level of the equity market*

Ordered logistic regression		Number of obs. = 423		
		LR chi2 (32) = 431.33		
		Prob. > chi2 = 0.0000		
Log likelihood = −321.7612		Pseudo R2 = 0.4013		
	Odds Ratio	Std. Err.	z	P>z
Age	1.280929	.1876845	1.69*	0.091
Married	.8274305	.2075166	−0.76	0.450
College	1.475188	.4796173	1.20	0.232
Postgraduate	2.059134	.9009673	1.65*	0.099
Business	.8793651	.3469473	−0.33	0.745
Services	.6622133	.2251679	−1.21	0.225
Industry	.6368752	.2639599	−1.09	0.276
Financial	3.180368	1.315889	2.80***	0.005
Construction	1.486994	1.014869	0.58	0.561
Male	1.162141	.3053662	0.57	0.567
Household				
2	1.175103	.7710404	0.25	0.806
3	.994581	.6059615	−0.01	0.993
4	.7995688	.4833902	−0.37	0.711
5	.864679	.5551092	−0.23	0.821
6	1.07348	.7984303	0.10	0.924
Income2	.6112246	.2442404	−1.23	0.218
Income3	.6956405	.3173841	−0.80	0.426

(*Continue*)

Table 1. *Continuation*

	Odds Ratio	Std. Err.	z	P > z
Income4	1.182606	.5195235	0.38	0.703
Savings as income percentage				
10.1%-15%	1.865117	.5702897	2.04**	0.041
15.1%-20%	3.246305	1.337753	2.86***	0.004
20.1%-25%	1.269224	.7607367	0.40	0.691
25.1%-30%	1.698428	.8788828	1.02	0.306
> 30.1%	2.04975	1.458519	1.01	0.313
Internet	26.45976	7.925102	10.94***	0.000
Print press	38.96186	12.89767	11.06***	0.000
Radio	.3607847	.2465476	−1.49	0.136
TV	4.972372	1.415934	5.63***	0.000
Debt record	.9362111	.2664311	−0.23	0.817
Expense record	1.350366	.353851	1.15	0.252
Revenue record	1.463467	.4310013	1.29	0.196
Savings record	.8254076	.2407518	−0.66	0.511
Other records	.0161918	.0314341	−2.12**	0.034
/cut1	3.227321	.7161335		
/cut2	4.270154	.732934		
/cut3	6.673613	.7918375		
/cut4	10.2331	.949044		

Note: ***, **, and * denote statistical significance at a 1%, 5%, and 10% confidence level, respectively.
Source: authors' calculations using data from our survey.

As expected, with regard to the financial variables, the higher the possibility of actual investment in the equity market, the greater is the knowledge of potential investors. While the variables related to wage levels have no significant influence, savings capacity does have it. To have a higher level of savings has a positive effect on the probability of knowing the equity market,

in contrast with those people who do not save (ceteris paribus). This seems to coincide with the findings of Bernheim et al. (2001). The probability that people who are able to save between 10 and 15% and between 15 and 20% of their income have knowledge of the equity market is 0.62 and 1.17 times higher, respectively, than the probability of those who have no savings capacity at all.

Finally, an important aspect revealed by the study is that the level of knowledge of the equity market is significantly affected by the types of media used by individuals to learn about the equity market. In this sense, individuals who use the internet and specialized press have 3.66 and 3.17 times higher probability to know about the equity market than those using other types of media. The use of television as mass media to obtain equity market information is also significant but less influential.

B. Determinants of the possibility to invest in the stock market

The results in Table 2 aim to analyze which characteristics have influence on the probability to invest in the BVC. This model incorporates as independent variables the probability of having low, average, high and very high knowledge of the Colombian equity market. This probability is obtained from the predictions made with the previous model. For these estimates, only the sub-sample of those individuals who said they had knowledge of the equity market is used. This fact reduces the number of observations to 222 individuals. The dependent variable, in this case, consists of those individuals who report to have invested in the BVC.[8]

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[8]   The individuals who report to have invested in stocks, bonds, currencies, fixed-term deposits, and investment funds are included in this category.

Table 2. *Probit estimation. Share in the equity market*

Ordered logistic regression		Number of obs. = 222		
		LR chi2 (28) = 77.18		
		Prob. > chi2 = 0.0000		
Log likelihood = −82.254263		Pseudo R2 = 0.3193		
	Odds Ratio	Std. Err.	z	P > z
Pv2	1.35e+20	3.16e+21	1.98**	0.048
Pv3	16237.73	113995.5	1.38	0.167
Pv4	5.27e+08	5.14e+09	2.06**	0.039
Pv5	2481144	2.14e+07	1.71*	0.088
Frequency of the information				
Daily	5.252706	7.53849	1.16	0.248
Occasional	1.213152	1.671109	0.14	0.888
When it is necessary	2.575589	3.689155	0.66	0.509
Hardly ever	.4894473	.8463192	−0.41	0.679
Age	1.755591	.4306315	2.29**	0.022
Married	.498515	.2499357	−1.39	0.165
College	1.102748	.7908303	0.14	0.892
Postgraduate	1.778518	1.463479	0.70	0.484
Credit	.6570969	.3190728	−0.86	0.387
Business	1.401643	1.162314	0.41	0.684
Services	2.041426	1.406549	1.04	0.300
Industry	1.516874	1.223499	0.52	0.605

(*Continue*)

Table 2. *Continuation*

	Odds Ratio	Std. Err.	z	P > z
Financial	.9537137	.7569224	−0.06	0.952
Construction	2.121446	2.112688	0.76	0.450
Male	.5224962	.2442866	−1.39	0.165
Independent	.5964984	.398702	−0.77	0.440
Income2	1.31968	.9123284	0.40	0.688
Income3	.5229035	.4033306	−0.84	0.401
Income4	.7990265	.560444	−0.32	0.749
Savings as income percentage				
10.1%-15%	1.235021	.7493918	0.35	0.728
15.1%-20%	2.111444	1.587728	0.99	0.320
20.1%-25%	3.414815	3.548248	1.18	0.237
25.1%-30%	6.376724	5.765912	2.05**	0.040
>30.1%	14.5173	16.485	2.36***	0.018
Constant	4.55e-09	4.20e-08	−2.08	0.037

Note: ****, **, and * denote statistical significance at a 1%, 5%, and 10% confidence level, respectively.
Source: authors' calculations using data from our survey

Firstly, we see that the model, considering the set of explanatory variables, is adequate. Secondly, we can confirm that the probability of having high and very high level of knowledge of the equity market increases the probability of investing in it. As in the previous case, and as shown in previous studies (Sungur, 2003), age has a positive influence on individuals' participation in the stock exchange. Finally, the percentage of savings is also statistically significant.

Specifically, individuals with saving rates higher than 25.1% of their income participate more actively through investments in the BVC. This fact is

consistent with the study carried out by Ariza and Giraldo (2013), which identifies savings as one of the major limitations of investment in the BVC. More specifically, Bernheim et al. (2001) states that individuals' savings capacity and wealth stock are among the determinants of stock market participation.

Conclusions

There is little knowledge and participation in the equity market in Colombia, and particularly in Barranquilla. This situation is caused by lack of knowledge and information about this market, in addition to income restrictions and indifference. These causes, combined with individuals' preferences for the banking market as the main savings option, reveal limitations at the citizen level with regard to education and information about specific markets such as the stock exchange.

Our results show that knowledge of the equity market is higher in older individuals with postgraduate education. For the case of Colombia, and even more so in Barranquilla, this reinforces the fact that the equity market is a very exclusive one that remains reserved for a minority with specific knowledge and resources. Especially, the highest level of knowledge and participation in this market is represented by socio-economic strata 4 to 6 from the North Central and Riomar historical locations.

The weight of market exclusivity of the equity market is more directly reflected in the relationship of knowledge and participation in it with the fact of working in the financial sector. The influence of this variable is greater than the aforementioned two variables. It is also confirmed that, beyond the income level, the savings rate (measured as a percentage of income) is important. Finally, it is worth to point out the influence of the media through which small investors read market-related news. While traditional media (print press) is still important, the surge of internet and television to a lesser extent denotes significant trend changes in how users satisfy their need for information.

Moreover, the results regarding stock market participation confirm the importance of prior knowledge as the main variable explaining the probability of involvement. Those who know the market are more likely to take part in

it. Logically, the age and availability of savings for investment go with this fact. These two items are clearly related to the extent that people are able to cover household needs, debts and other financial expenses.

Regarding financial education as an underlying element of knowledge and equity investment, the results are not very satisfactory. Although the government and some institutions have developed campaigns and educational programs in regard to economic and financial issues, their scope is very limited in terms of coverage. The proof of this is the lack of knowledge (85%) about the NSEFE among the surveyed population, which in turn contrasts with the interest to know about the advantages of the equity market (79%) and the importance of incorporating financial and equity subjects in the curricula of secondary education in the country (88%).

With regard to the obstacles to investment in the Colombian equity market, it is worth to point out the high costs of direct intermediation (commissions) in relation to the amounts of individual investment, lack of information, and regulation and market supervision. In line with this, other obstacles could be the lack of new issuers and defection of individual investors, instability of the tax regime, as well as distrust in the equity market as a consequence of the recent embezzlement by the largest brokerage firm in the country.

Finally, it is important to strengthen and enhance financial education programs in all strata of the population, so that sound knowledge and effective participation of citizens in the Colombian equity market is attained.

Appendix

Table A1. *Survey about knowledge of the Colombian equity market*

Variable	Definition
Age	Respondent age in years
Married	Variable dummy = 1 if marital status is married, 0 in another case
College	Variable dummy = 1 if the individual has college studies, 0 in another case
Postgraduate	Variable dummy = 1 if the individual has postgraduate studies, 0 in another case
Business	Variable dummy = 1 if the individual works in the business sector, 0 in another case
Services	Variable dummy = 1 if the individual works in the services sector, 0 in another case
Industry	Variable dummy = 1 if the individual works in the industry sector, 0 in another case
Financial	Variable dummy = 1 if the individual works in the financial sector, 0 in another case
Construction	Variable dummy = 1 if the individual works in the construction sector, 0 in another case
Male	Variable dummy = 1 if the individual is a male, 0 in another case
Household	Polynomial variable that states the number of people in the household. Take values from 1 to 5.
Income2	Variable dummy = 1 if the individual's income ranges from 1,768,502 and 2,947,500 Colombian Pesos, 0 in another case
Income3	Variable dummy = 1 if the individual's income ranges from 2,947,501 and 4,126,500 Colombian Pesos, 0 in another case
Ingreso4	Variable dummy = 1 if the individual's income is more than 4,126,501 Colombian Pesos, 0 in another case

(*Continue*)

Table A1. *Continuation*

Variable	Definition
Savings as income percentage	
10.1%-15%	Dummy = 1 if the individual's saving rate range from 10.1% and 15%, 0 in another case
15.1%-20%	Dummy = 1 if the individual's saving rate range from 15.1% and 20%, 0 in another case
20.1%-25%	Dummy = 1 if the individual's saving rate range from 20.1% and 25%, 0 in another case
25.1%-30%	Dummy = 1 if the individual's saving rate range from 25.1% and 30%, 0 in another case
> 30.1%	Dummy = 1 if the individual saves more than 30.1%, 0 in another case
Internet	Dummy = 1 if the individual educates himself through the internet, 0 in another case
Print press	Dummy = 1 if the individual educates himself through the print press, 0 in another case
Radio	Dummy = 1 if the individual educates himself through the radio, 0 in another case
TV	Dummy = 1 if the individual educates himself through the television, 0 in another case
Debt record	Dummy = 1 if the individual keeps a record of his debts
Expense record	Dummy = 1 if the individual keeps a record of his expenses
Revenue record	Dummy = 1 if the individual keeps a record of his revenue
Savings record	Dummy = 1 if the individual keeps a record of his savings
Other records	Dummy = 1 if the individual keeps a record of other categories than the aforementioned.

(*Continue*)

Table A1. *Continuation*

Variable	Definition
Frequency of the information	
Daily	Dummy = 1 if the frequency to learn about the equity market is "daily"
Occasional	Dummy = 1 if the frequency to learn about the equity market is "occasional"
When it is necessary	Dummy = 1 if the frequency to learn about the equity market is "when it is necessary"
Hardly ever	Dummy = 1 if the frequency to learn about the equity market is "hardly ever"
PV2	Probability that the knowledge level about the equity market is low
Pv3	Probability that the knowledge level about the equity market is average
PV4	Probability that the knowledge level about the equity market is high
Pv5	Probability that the knowledge level about the equity market is very high

Survey No. [ ]

Universidad Autónoma del Caribe	Knowledge survey over the Colombian Stock Market	International Business and Finance Program

The following survey is part of an investigation into the stock market. The purpose is to gather information to determine the level of knowledge that the citizens of Barranquilla have over the stock market. Your collaboration in the processing of this survey will be of great importance to achieve the objectives of the research. Therefore, we appreciate your greatest sincerity possible in your answers, which will be treated confidentially guaranteeing your anonymity and will be exclusively used for academic purposes.

A. Identification and survey control

1. Gender:
Male [ ]
Female [ ]
2. Age:
18 - 35 [ ]
36 - 50 [ ]
51 - 70 [ ]
> 70 [ ]

3. Marital Status:
Married [ ]
Single [ ]
Divorced [ ]
Widowed [ ]
Other(s), which?
_____

4. Residence (locality):
North Historic Center [ ]
South West [ ]
South East [ ]
Riomar [ ]
Metropolitan Area [ ]

5. Socioeconomic stratum:
One [ ]
Two [ ]
Three [ ]
Four [ ]
Five [ ]
Six [ ]

6. Level of education:
Elementary [ ]
High school [ ]
Technical [ ]
University [ ]
Postgraduate [ ]
Other, which?
_____

7. No. of people in your home:
One [ ]
Two [ ]
Three [ ]
Four [ ]
Five [ ]
> Five

8. Position which you hold within your household:
Head of household [ ]
Spouse of head of household [ ]
Son/daughter [ ]
Other, which?
_____

9. Survey control (Optional, for the purpose of survey verification)
Name of the respondent:
_____

Cell phone number or email address:
_____

B. Economic information and financial habits:

1. Are you currently working?
Yes [ ]
No **(go to 6)** [ ]
2. In which way do you do it?
Dependent [ ]
Independent **(go to 4)** [ ]
3. If dependent, what kind of contract do you have?
Indefinite [ ]
Fixed-term [ ]
Other, which? [ ]
4. In what type of institute?
Private [ ]
Public [ ]
Both [ ]
Third sector (NGOs, foundations) [ ]
5. To which economic sector does that institute belong to?
Commerce [ ]
Services Industry [ ]
Financial [ ]
Education [ ]
Agricultural [ ]
Construction [ ]
Other, which? [ ]

6. Locate your income in one of the following ranges:
0-589,500 [ ]
589,501-1,179,000 [ ]
1,179,001-1,768,500 [ ]
1,768,501-2,358,000 [ ]
2,358,001-2,947,500 [ ]
2,947,501-3,537,000 [ ]
3,537,001-4,126,500 [ ]
4,126,501-4,716,000 [ ]
>4,716,000 [ ]

7. Do you save?
Yes [ ]
No **(go to 11)** [ ]

8. What proportion of your earnings do you save?
5% - 10% [ ]
10.1% - 15% [ ]
15.1% - 20% [ ]
20.1% - 25% [ ]
25.1% - 30% [ ]
> 30% [ ]

9. Where do you invest your savings?
Banks [ ]
Employee funds [ ]
Credit union [ ]
Investment funds [ ]
Outside [ ]
Other(s), which?
_____
10. In which of the following do you invest your savings?
Financial assets [ ]
Real estate assets [ ]
Automobile assets [ ]
Leisure [ ]
Mortgage [ ]
Currency [ ]
Other(s), which?
_____
11. Do you currently have any credit(s)
Yes [ ]
No **(go to 14)** [ ]
12. Where did you acquire it?
In the Financial System [ ]
Outside the Financial System [ ]

13. Of your monthly income, what proportion goes into paying your debt?
5% - 10% [ ]
10.1% - 15% [ ]
15.1% - 20% [ ]
20.1% - 25% [ ]
25.1% - 30% [ ]
> 30% [ ]

14. Which of the following item(s) do you take record of?
Debts [ ]
Expenses [ ]
Income [ ]
Savings [ ]
None [ ]
Other(s), which?
_____

C. Knowledge of the Colombian Stock Market

1. Do you possess any knowledge of the Colombian Stock Market?

Yes ☐
No **(go to 18)** ☐

2. Degree of knowledge about this market:

Very high ☐
High ☐
Regular ☐
Low ☐
Very low ☐

3. Sort by importance (1 being most important) the following phrases that identify the functions of the stock market:

It is a thermometer of the state of the economy ☐
It produces variations on the prices of stocks ☐
It brings together people who want to buy and sell securities ☐
It allows investment in the short and long term ☐
It agglomerates savers' resources ☐

4. Do you have investments in the Bolsa de Valores De Colombia

Yes ☐
No **(go to 7)** ☐

5. In which of the following instruments have you invested?

Stocks ☐
Bonds ☐
Currency ☐
Certificate of Deposit (CDs) ☐
Other(s), which? ☐

6. Recently (in the past 6 months), have you acquired any securities issued by the State or a company?

Yes ☐
No ☐

7. Investing in the stock market involves:

Liquidity ☐
Profitability ☐
Risk ☐
Security ☐
Other(s), which? ☐

8. Do you intend on investing in the stock market in the coming months?

Yes ☐
No **(go to 11)** ☐

9. In which entities would you rely on to make such investment?

Stockbrokers ☐
Banking entities ☐
Other(s), which? ☐

10. Why would you choose such entity? (mark more than one option if necessary)

Solvency ☐   Advertisement ☐
Tranquility ☐   Security ☐
Experience ☐   Other(s), which? ☐
Comfort ☐
Tradition ☐   _____

11. Which of the following assets is more profitable?

Savings accounts ☐
Bonds ☐
Stocks ☐
Securitization ☐
Other(s), which? ☐

12. What benefits do you have when investing in the stock market?

Security ☐   Lower costs ☐
Greater profitability ☐ Greater liquidity ☐
Tax benefits ☐   Other(s), which? ☐

13. Do you know the financing instruments that the BVC offers to companies that require equity?

Yes ☐   No ☐

14. Main barriers in the Colombian stock market (mark more than one option):

Amounts of the initial investment ☐
Lack of information to the public ☐
Size of the market ☐
Instability and risk ☐
Other(s), which? _____ ☐

15. Frequency of informing yourself of the stock market:

Daily ☐
Occasionally ☐
When it is necessary ☐
Hardly ever ☐
Never ☐

16. Means through which you are informed:

TV ☐
Internet ☐
Specialized press ☐
Radio ☐
Other(s), which? _____ ☐

17. Is the stock market essential for the economic growth of a country?

Definitely yes ☐
Probably yes ☐
Undecided ☐
Definitely not ☐
Probably not ☐

18. Reasons for not investing:

Lack of knowledge ☐
Disinterest ☐
Lack of money ☐
Other(s), which? _____

19. Would you be interested in knowing the advantages the stock market may offer you?

Yes ☐

No ☐

20. Do you know of the national program for economic and financial education?

Yes ☐

No ☐

21. How important it is to incorporate financial content in the secondary education curriculum of the country?

Very important ☐
Important ☐
Indifferent ☐
Somewhat important ☐
Not important ☐

22. In which projects do you intend on investing your financial surpluses this year?

Studies ☐   None ☐
House ☐   Other(s), which? ☐
Tourism ☐
Business ☐
Savings ☐   _____

23. How do you consider the current situation of the country is to make investments?

Good moment ☐
Bad moment ☐
Do not know ☐

24. Do you believe the economic situation of the country at the end of this year compared to the previous one, will be:

Better ☐
Same ☐
Worse ☐
Do not know ☐

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