

An Empirical Analysis of Some Factors Influencing Financial Literacy

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Abstract

The purpose of this paper is to emphasize the association between financial literacy and economic development, respectively the level of education, and the education spending. In this respect, we analysed financial literacy rates (FLR), as dependent variable, and Gross Domestic Product per capita in current US\$ (GDP/capita), population by minimum completed level of education (PME) in % of the total population, and Education Spending (EDS) in US\$ per student enrolled in secondary level, as independent variables. Using the Excel software, we created the scatter plots, highlighting the trendline, and calculated the coefficient of determination (R^2) for the linear regression equation, and the correlation coefficient. The results showed that almost 50% of the variation in the financial literacy rate is explained by GDP/capita, whereas only around 33% is explained by EDS, and about 27% by PME. Therefore, we consider that the analyzed factors do not fully explain worldwide differences in financial literacy, which means that there are other factors that have a more significant influence upon financial literacy, as for example the national strategies focused on improving financial education.

Keywords: *financial literacy; economic development; level of education; education spending; linear regression equation*

JEL Classification: *I22; O11; C29; B23*

Introduction

The fast development and diversification of financial services and products requires that people “have the experience and knowledge to choose and use them”, in order to ensure “an equilibrium between consumers’ and banks’ interests” (Iacovoiu and Stancu, 2017). In this regard, the literature in the field and a number of studies conducted in the past years underline that improving financial education will increase efficiency and promote transparency with positive impact upon competition and financial markets stability (EP, 2014; Mandell, Klein, 2009; Brown, Garino, Taylor, Price, 2005).

However, the last financial crises (2008) as well as the previous ones shown that consumers have “a low level of understanding of financial products and services” (Valant, 2015), “financial illiteracy” being “widespread even in well-developed financial markets” (Atkinson, Messy, 2012). As a result, many consumers “prefer simple products and services” and “tend to acquire the first product” when they desire “a new current bank account or a new credit card” (Iacovoiu, Stancu, 2017).

Financial literacy affects financial behavior in many ways (Lusardi and Mitchell, 2014). Consumers that do not fully understand the concepts of interest rates and interest compounding “end up borrowing more and saving less money” (Stango and Zinman, 2009), and tend to “spend more on transaction fees, run up bigger debts, and incur higher interest rates on loans” (Lusardi and Tufano, 2015; Lusardi and de Bassa Scheresberg, 2013). Comparatively, people who possess a better understanding of fundamental financial concepts “are more likely to diversify risk by spreading funds across several ventures” (Abreu and Mendes, 2010), and tend to plan and save for retirement (Behrman et al., 2012; Lusardi and Mitchell, 2014).

Having as main objective “to improve financial literacy in order to promote healthier financial behavior and financial welfare”, some of the European Union Member States have developed and implemented national strategies for financial education focused on the following directions: “compulsory financial education in the school curriculum”; “creating websites for consumers and/or specialized online learning portals”; “the development of educational materials dedicated to different age groups”; “workshops and open days organized in collaboration with various representative institutions, such as universities, banks etc.” (Iacovoiu and Stancu, 2017; EBF, 2015).

Financial education is increasingly important, as financial products and services become more and more sophisticated and widespread. Therefore, we appreciate that a study focused on analyzing the factors associated to financial literacy can be of high interest for academics, policymakers, and regulators. Thus, the main purpose of this paper is to emphasize the relationship between financial literacy and the economic and social development.

Methodology

In order to rigorously analyze the association between the economic and social development and financial literacy, we used the following data (appendix, Table no.2):

- *Financial Literacy Rate (FLR)* provided by the study conducted by Standard & Poor's in 2014 in more than 140 countries (S&P Global FinLit Survey). The study consists on surveys conducted by telephone or face-to-face on more than 140.000 people, “aged 15 and above, aside from prisoners and soldiers”. Financial literacy rate was calculated as percentage of financially educated adults in the adults’ population, using questions focused on 4 basic financial concepts namely “interest rates, interest compounding, inflation, and risk diversification” (Klapper, Lusardi, van Oudheusden, 2015).
- *Gross Domestic Product (GDP) per capita* (GDP/capita) calculated by The World Bank in current US\$ as measure of the level of economic development.
- *Population by minimum completed level of education (PME)* computed by UNESCO as percentage of population graduating the upper secondary education in total population.
- *Education Spending (EDS)* calculated by the Organisation for Economic Co-Operation and Development (OECD) in US\$ per student enrolled in secondary level in “schools and other public and private educational institutions”. “Spending includes instruction and ancillary services for students and families provided through educational institutions.”(OECD, 2017)

We considered the financial literacy rate as depending variable and the GDP per capita, respectively PME, and EDS as independent ones. In order to verify the relationship between the FLR and the factors related to it, namely the independent parameters underlined above, we created the scatter plots, highlighting the trendline, and calculated the coefficient of determination (R^2) for the linear regression equation, and the correlation coefficient by using the Excel software.

The Relationship between FLR and GDP/capita

As presented in Table no.2 (appendix), the countries with the highest financial literacy rates, respectively 71 percent, are Norway, Denmark and Sweden, economies that also have a high level of the GDP/capita – 97,005 US\$ (Norway), 62,425 US\$ (Denmark), and 59,180 US\$ (Sweden). Comparatively, the lowest financial literacy rates (15 percent and below) can be find in countries with a low level of economic development, having a GDP/capita under 5,500 US\$, that are, in alphabetical order, Afghanistan, Albania, Angola, Somalia, and Yemen Republic.

In order to better emphasize the relationship between the analyzed parameters by using the scatter plots we eliminated the countries with FLR higher than 70 percent and/or GDP/capita over 60,000 US\$, respectively, in alphabetical order, Australia, Denmark, Luxembourg, Norway, and Sweden (figure no.1). These high developed economies have a financial literacy rates range between 53 percent (Luxembourg) and 71 percent (Norway, Denmark and Sweden).

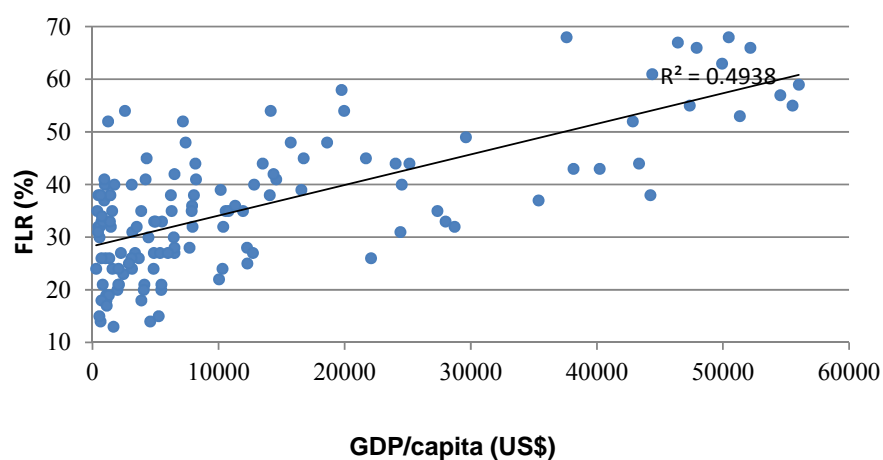


Fig. 1. The correlation between FLR and GDP/capita

Source: Data presented in Table no.2 – appendix

As shown above, 49.3% of the variation in the financial literacy rate is explained by GDP/capita, emphasizing that there is an association between the analyzed variables. This conclusion is also sustained by the value of correlation coefficient, calculated for 139 countries worldwide (appendix, Table no.2), respectively 0.72. This value underlines a relatively strong positive linear relation between FLR and GDP/capita.

Therefore, the level of economic development does not fully explain worldwide differences in financial literacy, which means that there are other factors that have a more significant influence upon financial literacy.

The Relationship between FLR and PME

The association between financial literacy and the level of education was analyzed for a sample of 68 countries around the world for which statistical data regarding the PME were available (appendix, Table no.2).

As shown below (figure no.2), only 26.7% of the variation in the financial literacy rate is explained by the level of education, given by the percentage of population graduating the upper secondary education in total population (PME).

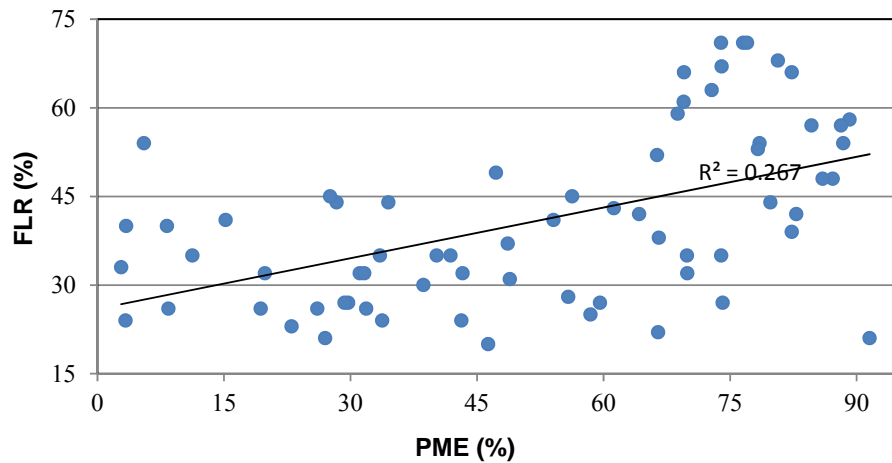


Fig. 2. The correlation between FLR and PME

Source: Data presented in Table no.2 – appendix

The value of correlation coefficient, calculated for the 68 analyzed countries worldwide is 0.5167, emphasizing a moderate positive linear relationship between FLR and PME.

The Relationship between FLR and EDS

Given the lack of statistical data regarding the education spending (EDS), the association between financial literacy and the EDS was analyzed for a sample of 37 countries worldwide of which 23 are European economies, most of them EU Member States (appendix, Table no.2).

As shown below (figure no.3), around 33% of the variation in the financial literacy rate is explained by the education spending.

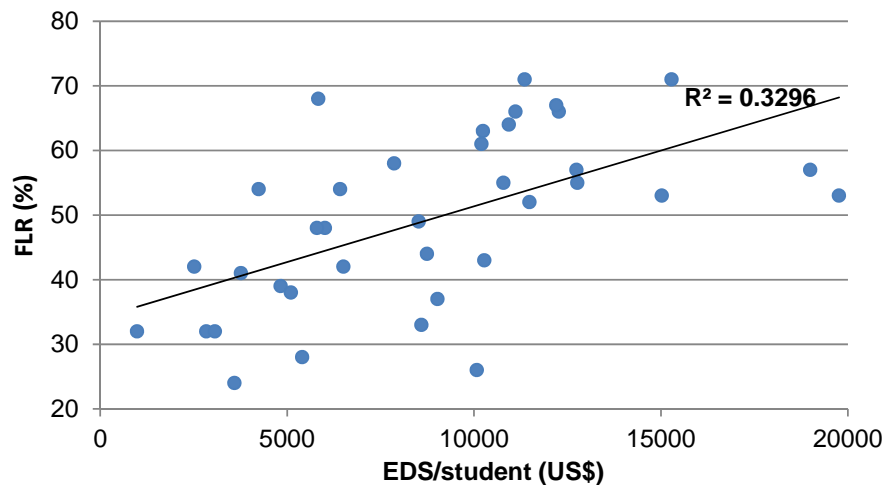


Fig. 3. The correlation between FLR and EDS

Source: Data presented in Table no.2 – appendix

The value of correlation coefficient, computed for the 37 analyzed countries, is 0.5741, highlighting a moderate positive linear relationship between FLR and EDS.

It has to be noticed that education spending seems to have a stronger influence upon financial literacy than the level of education – 0.329 (fig.no.3) is higher than 0.267 (fig.no.2).

The Limitations of the Study

The first limitation comes from the lack of statistical data for all the 139 analyzed countries regarding the level of education, and the education spending. Consequently, the results concerning the relationship between FLR, as dependant variable, and PME, respectively EDS, as independent variables, are only indicative, as the study requires more data for a better substantiation.

The second limitation comes from the accuracy of financial literacy rates if we take into account the GDP/capita and the level of education. For example, Romania that registered a GDP/capita of 10,020 US\$, and a PME of over 66% has a FLR much smaller (22 percent) as compared to countries where the GDP/capita is below 6,000 US\$, and the PME is under 26% (Table no.1).

Table 1. Comparative values of the FLR, GDP/capita, and PME

COUNTRY	FLR (%)	GDP/capita (current US\$)	PME (%)
Romania	22	10020.3	66.46
Bhutan	54	2560.5	5.51
Burundi	24	286.0	3.33
Burkina Faso	33	696.9	2.81
Côte d'Ivoire	35	1544.3	11.25
Congo, Dem. Rep.	32	437.8	19.85
Guatemala	26	3666.6	19.35
Honduras	23	2434.3	23.01
Pakistan	26	1320.6	26.07
Rwanda	26	697.6	8.42
Senegal	40	1041.7	8.23
Tanzania	40	957.9	3.40
Zimbabwe	41	931.2	15.19

Source: Data presented in Table no.2 – appendix

In our opinion, understanding financial concepts as “interest rates, interest compounding, inflation, and risk diversification” requires a certain level of education. Therefore, it is unlikely that in poor countries, figurdoes not graduate the high school, the percentage of the people “aged 15 and above” who understand financial concepts is so much higher (32%, 40%, 41% etc.) as compared with Romania (22%). Also, it has to be taken into account the fact that these countries did not developed and implemented national strategies for financial education.

Thus, in our opinion, some of the findings presented in the S&P Global FinLit Survey do not reflect the reality with accuracy. Consequently, the data regarding financial literacy rates have to be used as input in correlation analyses under some reserves concerning their accuracy.

Conclusion

The results of the analyses carried out showed that there is a moderate to relatively strong positive linear relationship between financial literacy rate, as dependant variable, and economic development (GDP per capita), respectively the level of education (PME), and the education spending (EDS) as independent variables. Thus, almost 50% of the variation in the financial literacy rate is explained by GDP/capita, whereas only around 33% is explained by EDS, and about 27% by PME.

Therefore, the factors analyzed above do not fully explain worldwide differences in financial literacy, which means that there are other factors that have a more significant influence upon financial literacy, as for example the national strategies focused on improving financial

education. As we stated before, in order to improve financial education, should be developed and implemented “education programs focused on the combined use of specific tools, dedicated to the age group of the target population” (Iacovoiu and Stancu, 2017).

Finally, the analyses presented above underlined the fact that data regarding financial literacy rates presented in the S&P Global FinLit Survey (2015) should be used with caution as input in correlation analyses, because they do not accurately reflect reality.

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APPENDIX

Table 2. Values of the FLR, GDP/capita, EDS, and PME (2014)

Countries	FLR ¹ (%)	GDP/capita ² (current US\$)	EDS per student ³ (current US\$)	PME ⁴ (%)
Afghanistan	14	633.9		
Albania	14	4568.6		
Algeria	33	5496.0		
Angola	15	5232.8		
Argentina	28	12245.7	5399.3	
Armenia	18	3861.9		
Australia	64	62004.8	10932.3	
Austria	53	51322.6	15023.6	
Azerbaijan	36	7886.5		
Bahrain	40	24515.0		
Bangladesh	19	1086.8		
Belarus	38	8032.5		
Belgium	55	47346.8	12763.1	
Belize	33	4884.4		
Benin	37	915.9		
Bhutan	54	2560.5		5.51
Bolivia	24	3124.1		43.14
Bosnia and Herzegovina	27	4852.3		59.57
Botswana	52	7153.4		
Brazil	35	11917.8		41.85
Burundi	24	286.0		3.33
Bulgaria	35	7853.3		73.94
Burkina Faso	33	696.9		2.81
Chad	26	1024.7		
Cambodia	18	1094.6		
Cameroon	38	1407.4		
Canada	68	50440.4		
Chile	41	14566.1	3760.8	54.06
China	28	7683.5		
Colombia	32	7918.1	2835.4	43.29
Costa Rica	35	10544.7		40.22
Côte d'Ivoire	35	1544.3		11.25
Croatia	44	13480.7		
Cyprus	35	27340.9		69.89
Czech Republic	58	19744.6	7860.7	89.16
Congo, Dem. Rep.	32	437.8		19.85
Congo, Rep.	31	3147.1		
Denmark	71	62425.5	10932.7	76.55
Dominican Republic	35	6268.6		33.49
Ecuador	30	6432.3		38.65
Egypt	27	3365.7		
El Salvador	21	4102.1		26.99
Estonia	54	19941.5	6417.2	88.41
Ethiopia	32	573.6		
Finland	63	49914.6	10237.5	72.81
France	52	42843.0	11482.0	66.34

Table 2 (cont.)

Gabon	35	10772.1		
Georgia	30	4429.7		
Germany	66	47902.7	11106.4	82.31
Ghana	32	1441.6		
Greece	45	21673.8		56.27
Guatemala	26	3666.6		19.35
Guinea	30	539.6		
Honduras	23	2434.3		23.01
Hong Kong (China)	43	40215.5		61.22
Hungary	54	14118.0	4236.4	78.49
Iran, Islamic Rep.	20	5442.9		46.31
India	24	1569.9		
Indonesia	32	3499.6	983.8	31.09
Iraq	27	6484.5		29.72
Ireland	55	55503.3	10785.7	
Israel	68	37582.8	5831.3	80.66
Italy	37	35365.1	9023.2	48.64
Jamaica	33	4993.2		
Japan	43	38139.4	10272.8	
Jordan	24	4831.0		
Kazakhstan	40	12806.6		
Kenya	38	1368.5		
Korea, Rep.	33	27989.4	8591.6	
Kosovo	20	4053.6		
Kuwait	44	43332.4		28.34
Kyrgyz Republic	19	1279.8		
Latvia	48	15710.2	6009.8	87.16
Lebanon	44	8148.6		
Lithuania	39	16555.6	4826.4	82.31
Luxembourg	53	117507.8	19762.3	78.30
Macedonia, FYR	21	5453.3		
Madagascar	38	452.8		
Malawi	35	362.7		
Malaysia	36	11305.9		
Mali	33	819.6		
Malta	44	25125.1		34.48
Mauritania	33	1371.0		
Mauritius	39	10153.9		
Mexico	32	10353.4	3064.5	31.63
Moldova, Rep.	27	2244.8		74.11
Mongolia	41	4201.7		
Montenegro	48	7378.0		
Myanmar	52	1227.1		
Namibia	27	5349.4		
Nepal	18	703.2		
Netherlands	66	52157.4	12269.1	69.53
New Zealand	61	44380.4	10197.8	69.49
Nicaragua	20	1960.5		
Niger	31	431.4		
Nigeria	26	3080.3		
Norway	71	97005.5	15282.9	77.01
Pakistan	26	1320.6		26.07
Panama	27	12712.4		
Peru	28	6490.2		55.81

Table 2 (cont.)

Philippines	25	2873.1		58.46
Poland	42	14341.9	6505.4	82.85
Portugal	26	22077.5	10073.7	31.87
Puerto Rico	32	28703.7		69.93
Romania	22	10020.3		66.46
Russian Federation	38	14051.6	5100.4	
Rwanda	26	697.6		8.42
Saudi Arabia	31	24406.5		48.89
Senegal	40	1041.7		8.23
Serbia	38	6200.2		66.56
Sierra Leone	21	794.1		
Singapore	59	56007.3		68.78
Slovak Republic	48	18595.2	5794.8	85.96
Slovenia	44	24020.7	8738.7	79.78
Somalia	15	536.9		
South Africa	42	6488.0	2513.1	64.22
Spain	49	29600.5	8519.7	47.24
Sri Lanka	35	3852.7		
Sudan	21	2087.7		
Sweden	71	59180.2	11353.9	73.92
Switzerland	57	85814.6	18994.1	84.64
Tajikistan	17	1113.4		
Tanzania	40	957.9		3.40
Thailand	27	5969.9		29.29
Togo	38	630.0		
Tunisia	45	4277.0		
Turkey	24	10303.7	3589.6	33.76
Turkmenistan	41	8199.0		
Uganda	34	734.7		
Ukraine	40	3104.7		
United Arab Emirates	38	44238.6		
United Kingdom	67	46412.1	12200.4	74.00
United States of America	57	54539.7	12739.8	88.15
Uruguay	45	16738.0		27.58
Uzbekistan	21	2036.7		91.54
Venezuela, RB	25	12265.0		
Vietnam	24	2052.3		
Yemen, Rep.	13	1651.0		
Zambia	40	1727.0		
Zimbabwe	41	931.2		15.19

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