The impact of education on money laundering[1]

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Abstract

Purpose – The purpose of this article is to present the impact of education on money laundering

Design / Methodology / Approach – Starting from the premise of a correlation between education and money laundering, it was analyzed on a sample of 185 countries, in the period 2012-2020, what is the meaning of the dependencies between these variables and how strong is the correlation between them. The research was further developed by classify the countries and split those 185 countries in 128 low-income countries (the low- and middle-income economies) and 57 high-income countries. Using econometric methods, our research provides empirical evidence for the existence of a significant impact of education on money laundering.

Findings - The results obtained confirm that in developed countries the increase in the level of education leads to a decrease in the risk of money laundering, while for developing countries additional research is needed to issue a conclusion on the impact of education on money laundering. Our study may have important implications for the policymakers who must acknowledge that the role of education in the field of combating money laundering.

Keywords: Money laundering, education, AML index, intelligence, developed countries

Jelcodes: I25, E26; K42

1. Introduction

The money laundering process has a long history, but has evolved and adapted to modern society, globalization and digital transformation, becoming a catalyst for many other illegal activities such as terrorism, fraud and corruption. All these lead to decline integrity and transparency and the creation of a widespread lack of trust in markets, causing major damage to citizens, companies and states (Dobrowolski and Sulkowski, 2019). The money laundering operation reflect the illegal act of hiding money from illicit activities and their transformation into legitimate money (Le-Khac et al., 2016; Syed et al., 2019), thus changing the clandestine nature of money (Qureshi, 2017). This phenomenon is also seen in the literature as a process, namely the process of transformation through which dirty, illegal money seems to be white and clean (Hetemi et al., 2018) or a complex process, which gives an apparent legality to some sums of money which come from illegal activities (Achim and Borlea, 2020).

Despite the fight against this scourge by the world's states and international organizations, money-laundering continues to be a growing phenomenon. United Nations Office on Drug and Crime (UNODC) estimates the amount of money laundered globally in one year around 2 - 5% of global GDP, or $800 billion - $2 trillion in current US dollars (United Nations Office on Drug and Crime, 2018).

In this context, in the fight against money laundering it is more than necessary to research the phenomenon from various perspectives, to identify the factors that enhance or diminish it and the action of the competent authorities depending on the results obtained. The research literature have highlighted various determinants of money laundering such as: *tax evasion* (Schwarz 2011) considering that money laundering is often done by resorting to tax heavens, the efficiency of *legal system (*Chong et al 2007, Ardizzi et al. (2014), *business sophistication (*Bajrang et al. 2012)*, soundness of bank (*Vaithilingam and Nair, 2009; Nikoloska and Simonovski, 2012),

possibility of detecting *suspicious transactions* (Drezewski et al. 2012, Vaithilingam and Nair, 2009; Nikoloska and Simonovski, 2012).

Starting to the aforementioned studies, in this paper, we focus to empirically explore the effect of education money laundering. There are a number of reasons why education may reduce the money laundering risk.

The first reason is related to ability to identify the "suspicious transactions". Business and financial sophistication make it difficult to identify suspicious transactions and employees find it increasingly difficult to cope with the increasing degree of financial sophistication to identify suspicious transactions (McKenna, 2017). For this purpose, banks should develop criteria capable of identifying deviant dealings or 'suspicious transactions' related to money laundering (Favarel-Garrigues et al., 2007). In this view, Nikoloska and Simonovski (2012) evidence the role of education of the bank employees in order to apply the proper indicators for recognized suspicious transactions in the system for prevention of money laundering. The same idea is followed by Isa et al. (2015) who conclude about the need of human expertise in order to deal with false alarm and to really assess whether the cases flagged out by the system are truly bearing money laundering risk. In addition, Lowe (2017) dedicates a large descriptive study in order to highlight the need for predictive intelligence to support anti-money laundering programs in the financial sector.

The second reason regards the connection of money laundering risk with institutions. Thus, in order to counteract the money laundering phenomenon, a country must have a legal, financial and law enforcement infrastructure (Peterson, 2001, p.15). In this regards Glaeser, et al. (2004), found that human capital enhances institutional environment in the short run and later the studies of Potrafke 2012, Kanyama 2014, Lv(2017) found that higher IQ level of a nation enjoy better quality of institution in that country. Thus, because a higher level of IQ determine a higher level of understanding and respecting the law.

Thirdly, money laundering is a criminal activity (together with shadow economy, corruption, organized crime etc.) and, as criminal activity, it is directly related with cognitive skills (Salahodjaev (2015). For instance, Hirschi and Hindelang (1977) and later Mõttus et al., 2012 found that IQ is a statistically significant determinant for criminal behavior and negatively influence the antisocial behavior. Moreover, cognitive skills positively influence the risk aversion (Frederick, 2005) and moral behavior (Oesterdiekhoff, 2014).

The proposed relationship between education and money laundering is empirical tested on a sample of 185 countries, for the period 2012-2020, separately for developed and developing countries.

The results show that in developed countries, the increase in the level of education leads to a decrease in the risk of money laundering, and for developing countries additional research is needed to issue a conclusion on the impact of education on money laundering.

The rest of the paper is organized as follows. The next section 2 designs the literature review made by using both VosViewer soft and a critical analysis. Section 3 highlights the results and discussions of the main empirical findings. The paper ends with the conclusions including a summary and a brief discussions of policy implications, limitations and the avenues for future research.

2. Literature Review the relationship between money laundering and education

2.1 Bibliometric mapping with VosViewer

Money laundering is a relatively recent defined and incriminating global activity, in a continuous dynamic development, the research on this subject not being very extensive yet. To investigate the current money laundering literature, we used a systematic approach using the WOS (Web of Science) database. Following the search for the phrase "money laundering", 1989 works were identified, published between 1986 and August 2021.

In order to meet the objectives of this paper namely to investigate the correlation between education and money laundering, we refined the research using this combination of terms. The search for works containing the phrase "money laundering" and the word "education" resulted in 107 articles over a period between 1993-2021 sorted by year of publication, the first 10 years in the order of the number of publications as in the Figure 1.
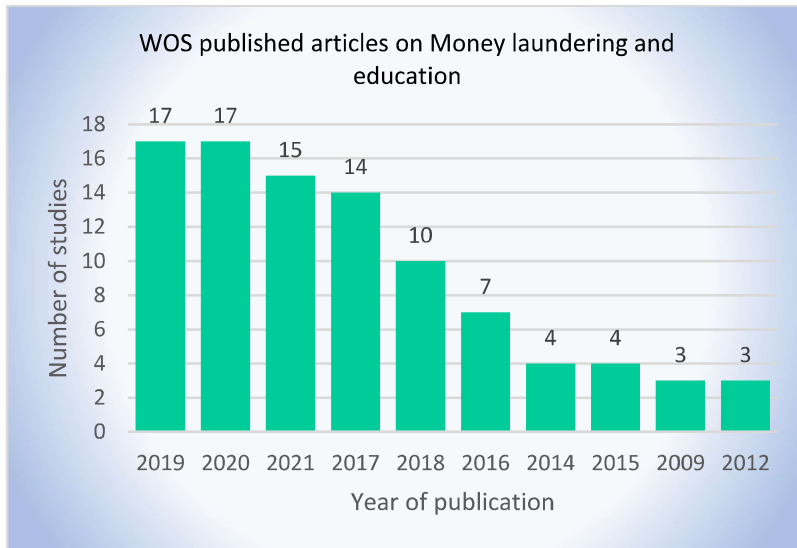
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Figure 1. Number of publications on money laundering and education - top 10 years

Source: own processing

From the processing with the VosViewer program of the articles, according to the number of occurrences of the connected words in these articles (at least 10 occurrences) resulted 76 commonly used terms, grouped in clusters, according to the links between them. Of these, the top 10 most used are: crime, corruption, case, impact, money, law, education, use, technology, effect. In addition, the most relevant terms according to the score calculated by the same software are: effect, shadow economy, impact, corruption demand, crime, international law, AML (Anti Money Laundering), blockchain, suspicious transactions (Figure 2).
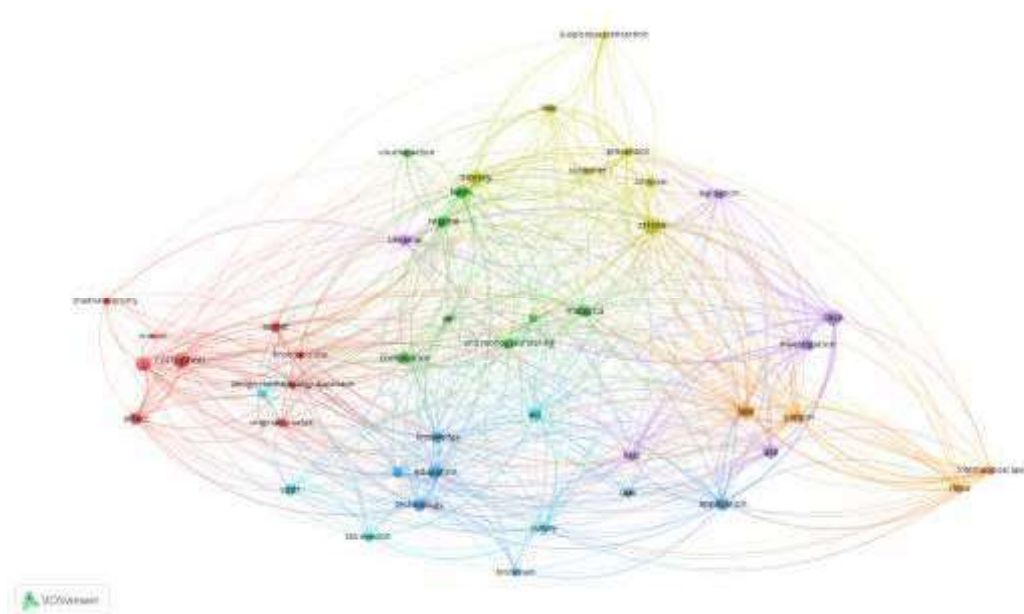

Figure. 2 Map of terms used in articles on money laundering and education

Source: own processing

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From the point of view of the distribution of words used over time, the map from Figure 2 shows that in the recent years we find the most common uses for the terms blockchain, Ukraine, investigations, shadow economy (Figure 3).
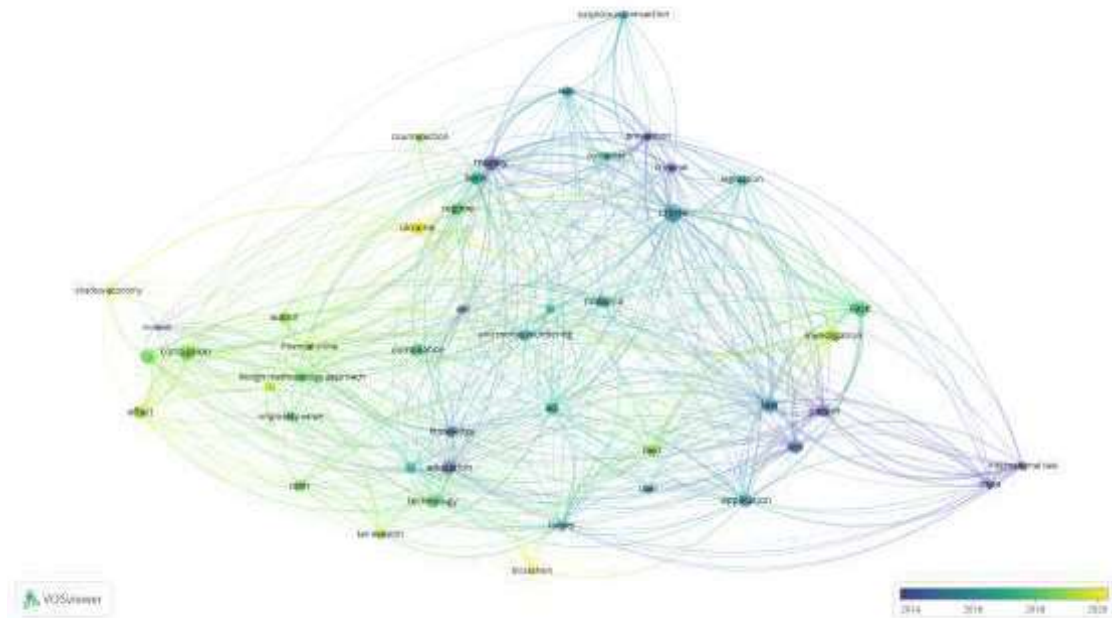

Figure 3. Map of the time distribution of terms used in articles on money laundering and education

Source: own processing

Analyzing the links between the terms, it is supported the hypothesis of the existence of a link between education and economic and financial crime, one hand but also between education and money laundering or education and preventing and combating money laundering, on the other hand. Regarding the latest research from the perspective of money laundering and education, it turns out that they target modern technology, the shadow economy as a whole, but also the geographical area of investigations. We also may note, that there is a double number of articles on money laundering and intelligence, compared to money laundering and education, as well as a greater variety of terms used.

Analyzing comparatively from the same database the articles containing the phrase "money laundering" and the word "intelligence", have resulted 210 articles, over a period between 1995-2021, distributed by country as in the figure 4.

Figure 4. Distribution by country of the number of articles published on money laundering and intelligence.

Source: own processing

2.2. Critical analysis

Regarding the relationship between education and money laundering, two main strands are found in literature.

On one hand, we had the findings which document a negative relationship between education and money laundering. The level of education is considered by the authors who approached this issue as having an important role in committing economic and financial crimes. Mõttus et al. (2012) consider that the level of intelligence (IQ) is a statistically significant factor for criminal behavior and negatively influences antisocial behavior.

At the same time, a higher level of intelligence determines a higher level of understanding and compliance of the law (Potrafke, 2012: Kanyama, 2014; Lv, 2017 and Kanyama, 2014). This is because intelligent and informed people are more likely to solve problems through institutions, through the regulated route than through illegal behavior (Salahodjaev, 2015). Similarly, Glaeser et al. (2004) find that human capital improves the institutional environment in the short term and later, studies by Potrafke (2012), Kanyama (2014) and Lv (2017) find that higher levels of a nation's IQ are linked to improved quality of institutions in that country. Potrafke (2012) empirically demonstrates that intelligence increases the efficiency of institutional quality by reducing the level of corruption. He explains this relationship by the fact that smarter people have longer time horizons and are not concerned with reaping immediate benefits by bribing officials. Kanyama (2014) also finds that countries with higher IQ levels enjoy improved institutional quality than countries with lower IQ levels in terms of the size of corruption, government efficiency, quality of regulation and the rule of law.

In the same view, the study conducted by Jiménez et al. (2015) highlight that both secondary and tertiary education have a very different effect on employment in formal or informal entrepreneurial activities. Thus, in particular, formal entrepreneurship is positively associated with secondary and tertiary education, while informal entrepreneurship is negatively affected only by tertiary education. In connection with education, certain studies (Chan et al., 2000 and Kasipillai et al., 2003) found that the decisions of American respondents to comply with tax laws were determined primarily by their age and education. However, McGee's (2008) study did not identify the level of education as a factor for tax compliance in the countries analyzed.

On the other hand, there is another category of studies (Achim & Borlea, 202o p.2), (Leția, 2014, p. 14), (Aniței & Lazăr 2016, p. 16) identifies another particularity of economic crimes and namely that they require a high level of professional knowledge and skills from those who commit such offenses. In such circumstances, economic and financial crime is closely linked to economic and social change and the development of society and it may appear as innovations made by individuals so as to adapt to changes in society (Merton, 1968). In the age of the Internet and artificial intelligence, such innovations are closely linked to cybercrime on financial transfers, requiring "special skills, work and a lot of perseverance" (Șcheau, 2018, p.17). The high level of digital fraud committed in the context of the growth of IT technologies can be explained by the pace of technical changes that go beyond the law enforcement capacity to deal with, investigate and prosecute these crimes (Gogolin, 2010). To keep up, investigating digital crime requires high investment in training, equipment, laboratory standards, infrastructure licenses and support software (Gogolin, 2010) and high investment in digital skills that are highly perishable (Bink et al., 2011). These criminal offences require the need of a fast and permanent specialization of the control and criminal prosecution bodies, because these facts generate high patrimonial prejudices , they lead to a luck of viabilities of companies and implicitly to the job loss, they affect the general quality of life.

As offenses in the field of economic crime require high knowledge and professionalism from those who commit them but also for those who may identified the and counteract them, we intend to test the following working hypothesis:

Hypothesis: *Increasing the level of education reduces the risk of money laundering*

In addition, it is reasonable to investigate the extent to which the relationship between education and money laundering may depend on the level of country development. Therefore, we state the following research question.

Research Question. *How does the impact of education upon money laundering differ between high-income and low-income countries?*

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3. Data & Methodology

For the purpose of our study, we use a sample of 185 countries, for the period 2012-2020. As there are no data on the volume of money laundering, the dependent variable used in the research was the Basel AML index, an index calculated annually since 2012 by the Basel Institute. The index is largely based on perception-based indicators and unlike financial risk models based exclusively on statistical calculations, the Basel AML Index assesses structural factors by quantifying regulatory, legal, political and financial indicators that influence countries' vulnerability to ML / TF. A panel data is conducted using the Eviews statistical software. The presentation of the rest of variables is made in the table 1.

Table 1. Describing variables

Variables	Way of calculation	Source
Dependent variables		
Money laundering	Money laundering is determined as the risk of money laundering and terrorist financing according to AML_Index (Antimoney laundering index). The score is provided by Basel AML Index determined for the world countries. The score ranges from 0 (low risk level) to 10 (high risk level) in money laundering/ terrorist financing.	Basel Institute on Governance (2021)
Independent variables		
School enrollment, tertiary	The level of education is measured used Education. School enrollment, tertiary (% gross). Gross enrollment ratio is the ratio of total enrollment, regardless of age, to the population of the age group that officially corresponds to the level of education shown. Tertiary education, whether or not to an advanced research qualification, normally requires, as a minimum condition of admission, the successful completion of education at the secondary level.	World Bank Group (2021)
Education Index	It is an indicator - a component part of the Human Development Index	Human Development Index (2021)
Human capital Index	The Human Capital Index measuring human capital is grounded on the following three pillars: **Survival**, as measured by under-5 mortality rates; **Expected years of Quality-Adjusted School** which combines information on the quantity and quality of education and **Health environment**	World Bank Group (2021)
Control variables		
Economic development	The level of economic development is measured used GDP per capita (GDP). GDP at purchaser's prices is the sum of gross value added by all resident producers in the economy plus any product taxes and minus any subsidies not included in the value of the products. It is calculated without making deductions for depreciation of fabricated assets or for depletion and degradation of natural resources. Data are in current U.S. dollars.	World Bank Group (2021)
Cybersecurity	The level of Cybersecurity is measured by Global Cybersecurity Index (GCI). This is a composite index of indicators, which monitors the level of cyber security and takes values between 0 and 1.	International Telecommunication Union (ITU) (2021)

Source: own processing

The general form of our model is:

$$Money\ laundering_{it} = \beta_0 + \beta_1 Education_{it} + \beta_{(j)2} Controls(j)_{it} + C_i + \varepsilon_{it}$$

where,

- Money laundering$_{it}$ is the dependent variable for the country i and period t;

- Education$_{it}$ is the independent variable, namely Education of the country i for the period t ;

- $Controls(j)$ is the jth control variable for the country i in year t;

- β0 denotes intercept;

- β1 is the regression coefficient that will indicate the extent to which the independent variable Educationi is associated with the dependent variable Money launderingit, if β1 is found to be statistically significant;

- $\beta_{(j)2}$s the regression coefficient for the jth variable in the vector of controls; j denotes the ranges, for the vector of control variables;

- ε_{it} is the residual or prediction error for country i at year t.

4. Results and discussions

4.1. Descriptive statistics

The descriptive statistics are presented in Table 2. This research is further developed to classify the countries by their level of economic development, in high-income and low-income countries. This classification is based on the data provided by World Bank Group (2021) where the countries are classified as high-income, upper-middle-income, lower-middle-income and low-income countries. We follow the classification made by World Bank Group (2021) and split our 185 countries in 128 low-income countries (the low- and middle-income economies) and 57 high-income countries.

Table 2 contains the main descriptive statistics for the two equations mentioned above. In our sample for the 185 countries, the Basel AML Index (the index that measures the risk of money laundering registers a variation between a minimum of 1.7786 (Finland 2017) and 8.6000 (Iran 2017).

Regarding tertiary education, the lowest value for developing countries is 1,5931 find it in Niger 2012 and for developed countries 1,3353 find it in Seychelles 2012, and the highest values, 113.2171 for developing countries we find it in Turkey 2018 and 142.8520 for developed countries, we find it in Greece 2018.

Table 2. Descriptive Statistics

Developed countries						
	AML_Index	Education tertiary	GDP	GII	HCI	GCI
Mean	4.375049	63.64126	39385.97	48.30677	0.723221	0.703923
Median	4.340424	68.62010	38685.26	49.85000	0.755960	0.729000
Maximum	7.016208	142.8520	116597.3	68.40000	0.814484	0.931000
Minimum	1.778681	4.999120	10484.91	22.58000	0.393321	0.343000
Std. Dev.	0.963257	30.80166	24104.71	10.21062	0.089181	0.160059
Jarque-Bera	5.405982	0.448116	12.78250	1.539670	88.34428	4.330762
Probability	0.067005	0.799269	0.001676	0.463089	0.000000	0.114706
Developing countries						
	AML_Index	Education tertiary	Education_Index	GII	HCI	GDP
Mean	6.013998	43.50986	0.631338	30.36014	0.545040	4479.273
Median	5.872615	40.02510	0.665000	30.48500	0.538636	3912.392
Maximum	8.600000	113.2171	0.851000	42.84000	0.777060	14613.04
Minimum	3.529025	3.732900	0.298000	18.95000	0.342000	461.4151
Std. Dev.	1.068534	23.64120	0.148271	5.582775	0.108443	3213.280
Jarque-Bera	0.602590	3.253302	4.206569	2.215903	1.028605	9.586269
Probability	0.739859	0.196587	0.122055	0.330235	0.597917	0.008286

Source: own processing

Table 3. Correlation between AML, Education tertiary and GDP per capita

Probability	AML_Index	Education tertiary	GDP per capita
AML_Index	1.000000		
Education tertiary	-0.345114	1.000000	
GDP per capita	0.008229	0.350024	1.000000

Source: own processing

The table 3 shows that the highest correlation is between GDP per capita and Education tertiary, followed by the correlation between AML Index and Education tertiary. The correlation between AML Index and education tertiary is also confirmed by figure 5.
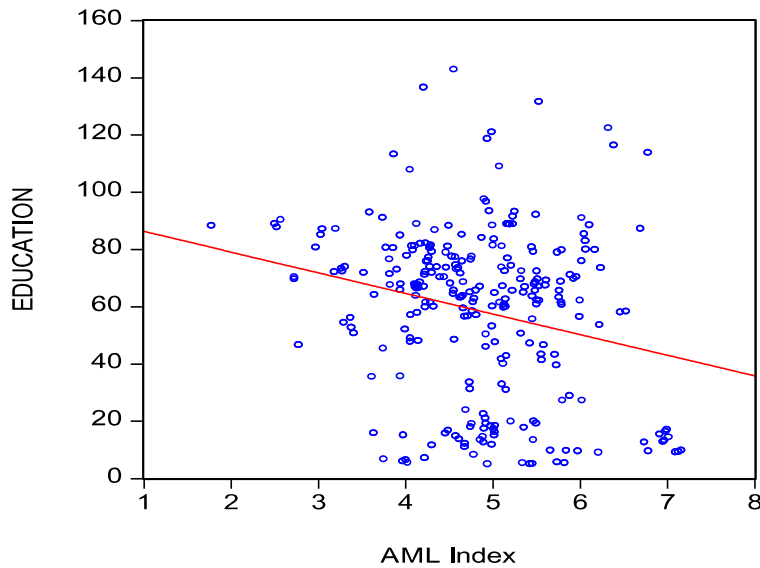
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Figure 5. The correlation between money laundering risk and education

Source: own processing

4.2. Empirical results

Tables 4 and 5 present the main econometric results for the estimation of money laundering (measures with AML_Index) as a function of Education and additional control variables for the subsample of 57 high-income countries (developed countries) (Table 4) and the subsample of 128 low-income countries (Table 5), respectively.

In the table 4, the Panel Least Squared between AML_index and Education is conducted for developed countries. The econometric model reveals that the values of the significance threshold are lower than the value of 10% (table 4). It can be stated that the parameters of the model are significantly different from zero. The coefficient R^2 has the value of 0.4641, which shows that 46.41% of the AML_Index variation is due to the variables considered. It can be stated that there is a statistically significant negative relationship between the dependent variable AML and the level of Education measured by Education tertiary and Human capital index (HCI). The higher the level of education is, the lower the level of risk of money laundering. In addition, a positive influence of GDP and Global security index (GCI) is found in relation with risk of money laundering, for the developed countries. From an economic point of view, the model highlights unambiguous dependencies between variables related to money laundering, variables of a financial nature, GDP per capita, but also education and the cyber security indicator. Therefore, the AML model in developed countries creates a true picture of the influences of important indicators in increasing the risk of money laundering. Analysing the coefficients of all significant variables, it results that in developed countries, increasing the level of education reduces the risk of money laundering while economic development (measured by GDP) and increasing cybersecurity increases the risk of money laundering.

For developed countries (table 4)

$$AML\_Index_{it} = -0{,}0076 \times Education_{i,t} + 1{,}0986 \times GDP_{i,t} + 1{,}0601 \times GCI_{i,t} + 8{,}2226_i + \varepsilon_{it}$$

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Table 4. Panel Least Squared AML-Education- developed countries

Variable	Coefficient	Std. Error	t-Statistic	Prob.
Education tertiary	-0.007664	0.003583	-2.138697	0.0363
Human capital index (HCI)	-6.263950	0.947428	-6.611531	0.0000
GDP	1.098651	4.87E-06	2.254311	0.0276
Global security index (GCI)	1.060123	0.400000	2.650305	0.0101
C	8.222617	0.686659	11.97483	0.0000

R-squared = 0.4641

Source: own processing

Table 5 reveals the Panel Least Squared between AML and Education for developing countries. The coefficients of all significant variables reveal that increasing the level of education (measured by Education tertiary, Education Index and Human capital index (HCI)) leads to an increase in the risk of money laundering. However, these relationship are not statistically significant. The coefficient R^2 has the value 0.17, which shows that 17.66% of the money laundering risk is influenced by the variables taken into account, however with reservation regarding the significance in term of statistics. In addition, the economic development (measured by GDP) and increasing the level of cybersecurity reduce the risk of money laundering.

For developing countries (table 5)

$$AML\_Index_{it} = 0.0097 \times Education_{i,t} - 0.0516 \times GCI_{i,t} - 0.0001 \times GDP_{i,t} + 7.4772_i + \varepsilon_{it}$$

Table 5. Panel Least Squared AML-Education-for developing countries

Variable	Coefficient	Std. Error	t-Statistic	Prob.
Education_tertiary	0.009778	0.006029	1.621793	0.1095
Education_Index	0.146522	1.947857	0.075222	0.9403
Human capital index (HCI)	0.337004	2.197797	0.153337	0.8786
Global security index (GCI)	-0.051699	0.028993	-1.783165	0.0790
GDP	-0.000115	5.75E-05	-1.999805	0.0495
C	7.477295	0.902622	8.283972	0.0000

R-squared = 0.176613

Source: own processing

Concluding, our research confirms the hypothesis that *Increasing the level of education reduces the risk of money laundering*, but only for developed countries, resulting in countries with a higher number of people with higher education, the risk of money laundering is lower. A similar result shows that people with a higher level of intelligence are less prone to money laundering (Lowe, 2017). The role of educating bank employees to identify suspicious transactions is found by Nikolaska and Simonovski (2012) but also by Isa et al. (2015) which established that human experience and expertise is what can distinguish between a real threat of money laundering risk and a forced threat. Similar study of Achim et al. (2021) conducted for 182 countries over the period 2012–2017 find that intelligent people are more prone to comply with the law and thus increase the efficiency of implementing government policies to reduce economic and financial crimes.

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Regarding our research question, we may find different results obtained among the two subgroups of developed and developing countries while our results conducted for the developing countries' subsample do not support education as being a determining factor for money laundering, in these countries, other determinants are more important for engaging in such activities.

5. Conclusions

The purpose of this article is to present the impact of education on money laundering. Starting from the premise of a correlation between education and money laundering, it was analyzed on a sample of 185 countries, in the period 2012-2020, what is the meaning of the dependencies between these variables and how strong is the correlation between them. The research was further developed by classify the countries and split those 185 countries in 128 low-income countries (the low- and middle-income economies) and 57 high-income countries. Using econometric methods, our research provides empirical evidence for the existence of a significant impact of education on money laundering.

Our study achieved its intended purpose of determining the impact of education on money laundering, thus confirming that at least in developed countries increasing the level of education reduces the risk of money laundering.

The results obtained confirm that in developed countries the increase in the level of education leads to a decrease in the risk of money laundering, while for developing countries additional research is needed to issue a conclusion on the impact of education on money laundering. Our study may have important implications for the policymakers who must acknowledge that the role of education in the field of combating money laundering.

The research is limited primarily by the lack of studies in this field and secondly by the number and weight of identified variables. But it is a start that can be developed by using several proxies and independent and control variables to determine the impact of education on money laundering with a greater degree of statistical significance.

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