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Role of Digital Technology in the Audit Process to Reduce Money Laundering in the Banking Sector

By

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Abstract

In the current accelerated spread and the evolution of digital technologies, it is visible that there are crucial impacts on financial and economic crimes. On top of that, there have also been ways to combat and prevent money laundering crimes brought about by the advancement of technologies. In this research, I will expand on the correlation between money laundering and technological advances that are digital technology, including the strong dependency on the aid of 162 states between the year 2012 to 2020. Using the econometric models and methods, vital control variables, independent variables, and technology and internet adoption, this research offers empirical proof of the crucial effect of technology on money laundering. There is clear proof in the actual data that the rise of digital technology has decreased money laundering. Concerning the findings, it is clear that money laundering is more prone in developed and less developed countries. In reflection, this research will provide evidence essential to decision-makers, government, and investors in various market areas who appreciate the role of technology in money laundering combating.

Key worlds: Auditing, Digital technologies & Money laundering and Auditing

Introduction

In the current period, laundering of money has been a challenge that technological advancements have contributed to; transactions conducted mainly with the aid of electronic gadgets, environments that are virtual around the globe at impressive speeds own a significant risk to the functionality, stability of the community and integrity concerning the system financially. Notably, technological advancements have begun to impact the financial arena randomly. Concerning the Financial Action Task Force (FATF), the organization has invested heavily to gain an understanding of the vulnerabilities and the risks of the newly improvised services and goods payment methods and that the Combating the Financing of terrorism (CFT) and Anti Money Laundering (AML) are updated concerning the emerging technological advancements. Apart from mitigating the associated risks and maintaining transparency, the FATF has a major role in developing partnerships among the Reg Tech and Fin Tech societies to support creativity and innovation in the financial aspect.

Initially, FinTech was involved with the application of technological-based technologies to offer customer-oriented new services and products, for instance, loans in the online market, payments via mobile phones, virtual currency payments, crowd financing, and mobile banking (Alam et al., 2019). In the current world, FinTech is concerned with applying new technologies that ought to be digital in the financial sector for the aims of an intensive variety of ways (Vasile et al., 2021). FinTech uses emerging technologies to generate

automated back and mid-office functions, such as machine learning and big data, algorithms, securities, settlement payments, wholesale financing, and compliance with legal regulations (Balkan, 2021). On the other hand, Reg Tech is some Fin Tech that applies the use of the latest technologies to qualify for the rules more effectively than the existing capabilities.

Various studies have concluded that digital technology is two-sided concerning money laundering. The negative impact is increased crime cases via modern communication, information technology, and cryptocurrency rumors (Javor, 2020). At the same time, the positive side is the implementation of new technologies to help generate solutions and combat money laundering by using technological advancements. Firstly, authors, for instance, Sadgali et al. 2019, base their argument on the role of technological advances in tracking down the illicit flow of money in regions such as terrorist funding and money laundering hence aiding in the reduction of the laundering cases (Boccialone, 2021). Secondly, various authors, including Awoyemi,2021, have based their arguments on the fact that technological advancements have led to the increase of fraudsters through the misuse of the improvements to get involved in cybercrimes. Concerning the study conducted in 162 countries for eight years, the findings prove that the increase in technology adoption and internet users' percentage end up reducing money laundering risks.

Methods

Concerning the above research by various scholars, it is visible that there is a dependency between laundering money and digital technologies. Following the research conducted on the 162 nations in the investigation of the correlations, the study made use of the following descriptive variables:

Dependent variable: funds laundering

On money laundering, the study used the Basel ALM index, a calculated index yearly by the Basel Institute since 2012 (Manning et al., 2021). Also, the Basel ALM index is used to assess the structural factors by using legal, political, financial, and regulatory measures that affect nations' vulnerability to TF/ML (Gasparėnienė et al., 2022).

Independent variable: technology

Digital technologies have been integrated into day-to-day life through digitization. In this study, the obtaining of values has been borrowed, and the use of the own square processing method has been applied in the 2019-2020 duration (Ochs &Riemann, 2018). Data was also taken from the world economic Forum from 2012 to 2018 and from the world bank from 2012 to 2020 and the integration of technology such as the EViews statistical software to obtain the periods.

The model

Estimation panel models for regression are targeted at the laundering of money. They are assessed through the AML index as a function of dependent, independent, and controlled variables. The applied model formula:

$$\text{Money laundering } (AML)_{it} = \beta_0 + \beta_1 \text{Technology}_{it} + \beta_{(j)2} \text{Controls } (j)_{it} + C_i + \varepsilon_{it}$$

Where;

a. $(AML)_{it}$ is the variable that is dependent on the period t and country i;
b. The technology $_{it}$ is the country's Internet yearly, whereas selection for countries i year t;

c. Controls(J)$_{it}$ is the j-th control variable for the country i in year t- GDP, education, GCI (cybercrime), tax burden tax, and GII;
d. β_0 intercept;
e. β_1 regression coefficient indicating the breadth of the technology and Internet selection is concerned with money laundering if β_1 is discovered to be significant arithmetically;
f. $\beta_{(J)}{}^2$ coefficient regression for j-^{va}riable on the controls that are vector; ranges are denoted by j where for the vectors control variables;
i. i panel date countries
ii. t time or period (2012-2020)
iii. ε_{it}error predicted for the year t country i.

Results and Discussion

Descriptive statistics

Analysis of the findings based on dimensions such as econometric modeling, relationship analysis, and descriptive statistics of the correlation between dependent and independent variables(Shabbir & Wisdom, 2020). Concerning the findings, the highest money laundering risks were found in countries like Cambodia, Afghanistan, and Iran where else, whereas the lowest be-encountered chances are inclusive of European nations; the descriptive results whereas noted in the table below:

Variables	Mean	St. dev	Maximum	Minimum
Tax burden	75.67	13.02	99.0	36.56
GDP per capita	19212.13	23465.56	135423.46	320.34
Technology	4.89	0.61	6.33	2.71
Internet	59.30	28.65	100.00	1.03
AML Index	5.60	1.23	8.76	1.85
Education	0.80	0.17	1.12	0.18
Cybersecurity	0.55	0.31	1.00	0.03
Innovation	39.34	12.13	69.53	18.23

The average level of people using the Internet is 59.30, with the highest number of internet consumers in North European countries. At the same time, the lowest is the majority found in the African nations. On top of that, the rate of technology adoption is around 4.89, with the highest countries in the United Arab Emirates and the minimal levels of digital technology experienced in Yemen, Venezuela, Myanmar, and Mauritania (Marti &Puertas, 2020).Additionally, to gauge the sign of the correlation between digital technology level and money laundering, this study factorized the relationship between the two independent and the dependent variables, which are considered in the applied model, while also controlled variables in tables 3 and 4 that resulted in the graphs in figure 3 and 4 of laundering money against each technology adoption and the Internet (Al-Suwaidi &Nobanee, 2020). Tables 3 and 4 appreciate the negative correlation between technology and the Internet and laundering money. Visualizing this analysis, they acknowledge the correlation between laundering money and the controlled variables considered in the applied model, except for the burden brought by taxation.

Table 3. *Relation between the variables, AML, and the Internet*

Correlation	AMLINDEX	INTERNET	GDP	TAXBURDEN	EDUCATION	GII	GCI
AMLINDEX	1.00000						
INTERNET	-0.638338	1.00000					
GDP	-0.451637	0.697364	1.00000				
TAXBURDEN	0.317554	-0.257586	-0.462334	1.00000			
EDUCATION	-0.637371	0.836783	0.636727	-0.293648	1.00000		
GII	-0.583478	0.647867	0.683746	-0.458273	0.668428	1.00000	
GCI	-0.514324	0.627823	0.457373	-0.278747	0.634992	0.448789	1.00000

Table 4. *Relation between Technology, AML, and variable*

Correlation	AML INDEX	TECHNOLOGY	GDP	TAX BURDEN	EDUCATION	GII	GCI
AML INDEX	1.00000						
TECHNOLOGY	-0.537263	1.00000					
GDP	-0.489348	0.732748	1.00000				
TAXBURDEN	0.3173647	-0.358273	-0.468279	1.00000			
EDUCATION	-0.6836734	0.558923	0.642369	-0.317626	1.00000		
GII	-0.5723624	0.675246	0.727836	-0.463987	0.662837	1.00000	
GCI	-0.4978252	0.522358	0.442673	-0.278979	0.528979	0.427687	1.00000

Indirect, negative relationships between independent variables and AML Index denote that increment in digital technology adoption results in a decrement in the risks associated with money laundering (Achim et al., 2021).

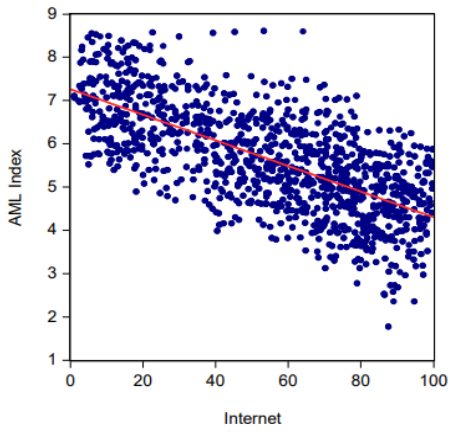

Figure 3. Plots of Money laundering (AML index) against individuals using internet as % of population (Internet)
Source: own processing

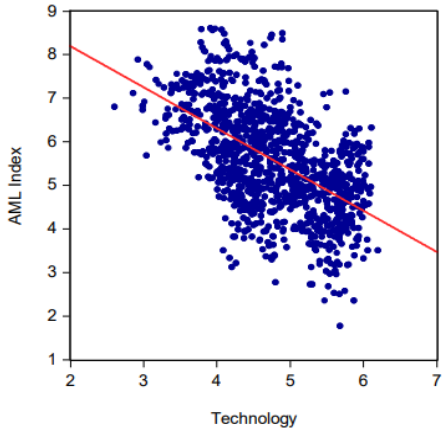

Figure 4. Plots of Money laundering (AML index) against technology adoption (Technology)
Source: own processing

Concerning the above graphs, Figures 3 and 4, it is visible that both of them show the relationship between digital technology and the laundering of money denoted by the AML Index.

Multiple regression estimation was used to build the findings. We first explicitly define money laundering (AML) as a function of a person's use of the internet (Internet) or their adoption of technology (Technology), the variables of interest. To create a Pooled-OLS regression, the additional independent variables are then included. We use these indexes' standardized values to provide homogeneous data that can be aggregated because each index contains data measured using a different methodology.

The Internet coefficient is negative and significant for the OLS model in Table 5's estimation of money laundering as a function of the Internet and other reliable control variables for the sample of 162 nations globally. Money laundering (AML index) drops by 0.15 units for every 1% growth in the value of the Internet.

Variable	Coefficient	Std. Error	t-Statistic	Prob.
Internet	-0.152388	0.030021	-4.870172	0.0000
GDP	0.146115	0.035628	4.139220	0.0000
Tax Burden	0.125534	0.038293	3.349316	0.0008
Education	-0.276595	0.034954	-8.199105	0.0000
GII	-0.172322	0.031701	-5.581405	0.0000
GCI	-0.081652	0.012031	-4.238911	0.0000
C	83.12445	3.580474	23.28827	0.0000
R-squared	0.526849	Mean dependent var		54.69889

Given that the results show that probabilities are equal to 0, the findings are essential at any degree of acceptance. The R-squared value of 0,5268, which measures the model's goodness-of-fit, shows that the dependent variable, money laundering (AML Index), depends on the examined independent variables in a ratio of 52,68%. In this manner, the state-researched theory is adopted, which means that growing Internet usage (Internet users) determines declining money laundering as evaluated by the AML index(Gasparėnienė et al., 2022).Regarding the other variables, it can be seen that money laundering influences them all to a 10% acceptable level. Thus, education and innovation have a detrimental impact on money laundering, consistent with studies that find that more innovative, more informed people are more likely to solve problems through legal channels than illegal ones. Additionally, human capital enhances the institutional environment. According to the proposed model, money laundering is positively impacted by GDP and tax burden.

The table below summarizes the results and the estimate of the multiple regression for independent variables on different columns. Fixed Effects Model (FEM) and the Random Effects Model for the Internet's variable (REM).

	FEM		REM	
Variable	Coefficient	Prob.	Coefficient	Prob.
Internet	-0.056017	0.0552	-0.069609	0.0133
GDP	-0.116295	0.1842	-0.061270	0.2771
Tax Burden	0.267971	0.0260	0.172466	0.0123
Education	-0.057239	0.6169	-0.313085	0.000
GII	-0.019283	0.4766	-0.047134	0.0559
GCI	-0.062446	0.0003	-0.059314	0.0002
C	47.77328	0.0001	73.21554	0.000
R-squared	0.900611		0.210346	

Both models in the table above support our theory, proving that the Internet has a sizable and indirect impact on money laundering at a 10% acceptance level, comparable to the OLS model. In addition to the Internet, the FEM model also considers cybersecurity and tax burdens concerning money laundering. GDP, education, and innovation are the three factors that are not significant in this model. The R-squared in the FEM model is 0.90, meaning that 90% of the independent factors under investigation are dependent on the dependent variable, which is the AML Index. In this situation, the independent factors significantly influence the proportion of AML; however, it must be minded that four of the control variables are not significant for our model when comparing the findings to the first model, OLS(Boccialone, 2021).The internet, education, innovation, and cybersecurity all harm money laundering in the REM model (increasing this variable predicts a decrease in money laundering risk).

In the REM model, one variable (GDP) is insignificant in connection to the AML index. R-squared is lower than other models (OLS – 0.52 and FEM – 0.90). In contrast, the tax burden has a positive impact, supporting the OLS model.

Notably, the findings demonstrate that while Internet value rises by 1% in both developed and developing nations, money laundering (measured by the AML index) falls by 0.15 units in high-income states and by 0.08 teams in developing countries, supporting our theory. The fact that the value of the Internet coefficient is somewhat higher and nearly double in industrialized nations is a highly significant and intriguing element (Sadgali et al.2019). We can conclude that industrialized countries are more affected by the Internet than developing countries regarding money laundering. Education is another factor that significantly and indirectly affects the AML index in both samples, as is to be expected. In light of this, the findings from our analyses of OLS for Internet and Technology Adoption, FEM for Internet and Technology Adoption, REM for Internet and Technology Adoption, as well as for Internet in Developed and Developing Countries, and Technology Adoption in Developed Countries, support our research hypothesis that a higher level of digital technology determines a decrease of the dimension of money laundering.

The findings and results are in conjunction with the work of several researchers, who realized that technological advancement could be used to figure out illegal money in areas such as financing hence detecting the phenomenon of laundering money (Wronka, 2021). From the results of the study, it has come a common goal is that the Internet and technology in both developing and developed states, high levels of technology are the determinants of the dimensions of laundering money. Apart from the fact that money launders can explore digital technology, the technology also helps and is applied in the increasement of the efficiency of anti-money laundering (Gebrands et al., 2022). In addition, other scholars have concluded that investments of capital into better usage of the internet rates in the shadow dimensions of economies. Gnangnon (2020) affirmed that internet availability in developing countries affects the positive side of tax reforms. Concerning the control variable's influence, it is visible that there is a decrease in money laundering from an increase in the education level that is gauged by the use of the education index (Çemberci&Yurtsever, 2022). Similar results from researchers indicate that money laundering is less affected by high intelligence.

Conclusion

Money laundering is affected by technological advancements in the information from the shortlisted 162 states for eight years. Also, from the findings, it is visible that an increase in technology results in exposure to money laundering. In regards to the influence owned by

the variables, there is evidence of roles in cyber security, education, and innovation on the AML Index. Digital technology has suitable potential for the efficiency of AML apart from the reason that it might result in an increment of financial exclusion of various societal segments. FATF provides the regulations to work in hand with the private firm's approach to digital technologies considering its limitations and potential.

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