The Role of Social and Psychological Dimension in the Study of the Economy of Money Laundering

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Abstract

Previous research showed that public policies regarding expenditures on public order and safety, punishments, employment opportunities, schooling are determinants for the crime rate, mainly property crime. Since there is little study available in the literature on the determinants of money laundering, we wanted to see if unemployment, the level of adult education, emotional well-being, morality, or the health of a tax system has a particular influence on the financial crime rate. For this purpose, we built an econometric model, through which we aimed to capture the influencing socio-economic factors of money laundering crime rates in 21 countries during 2013 and 2018. The results have shown that unemployment and fiscal health influence 20% of the money laundering rate variation, at a 95% confidence level. Increasing emotional well-being lowers the crime rate of money laundering at a 10% significance level, while education and morality are not statistically significant.

Keywords

Money laundering; unemployment; corruption; education; economics of crime.

Introduction

The money laundering phenomenon is flourishing despite the international efforts to counteract it. The number of suspicious activity reports has been rising steadily throughout the years, and so has the number of crimes committed. Moreover, according to the study conducted by Market Study Report LLC, the Global Anti Money Laundering Market is anticipated to grow by more than 15.60 % over 2020-2027.

The previous theoretical and empirical literature on the relationships between crimes (mainly property crime) established different determinants such as income inequality, unemployment, level of education, the probability of conviction, and others. Studies have shown that public policies shaping the economic and social environment, regarding expenditures on public order and safety (police services, law courts, and prisons), punishments for different types of crime, opportunities for employment, schooling, are determinants for the crime rate. Simultaneously, the rationality and preferences of would-be criminals also influence the amount of crime.

However, few studies cover the social and psychological influencing factors of financial crime. In these circumstances, we considered the analysis of financial crime from a socio-economic perspective of great use. The present paper focuses on identifying and analyzing the social and psychological determinants at an international level.

The types of legal jobs available, law, order, and punishment, are an integral part of the economic approach to crime. Our socio-economic approach to crime could help public decision-makers and entrepreneurs whom internal actors seldom harm to fight against financial crime.

Literature review

Fleisher (1963; 1966) was the first who attempted to analyze the relationship between crime and socio-economic variables from an economic point of view. However, Becker (1968) was the starting point for analyzing societal choice control policies in terms of crime in the context of an economic model. He used economic analysis to develop optimal public and private policies to combat illegal behavior. He created a function that links the number of offenses to the probability of conviction of a person, the punishment obtained if convicted, and other variables such as his disposable income from legal versus illegal activities, the frequency of arrests, and his willingness to commit an unlawful act. Becker (1968) showed that an increase in the probability of conviction or an increase in the punishment of an individual if convicted would generally lead to a decrease (perhaps substantial, perhaps negligible) in the number of offenses.

In his Nobel work, Becker (1993) mentioned that in the 1950s and 1960s, intellectual discussions of crime were dominated by the view that criminal behavior was caused by mental illness and social oppression. This approach has significantly influenced social policies, leading to a change in the law to extend criminals' rights. According to Becker (1993), individuals maximize their well-being in how they conceive of this maximization: egotistical, altruistic, masochistic, or mischievous. He considers that actions are constrained by income, time, imperfect memory, the ability to calculate and other limited resources, and the opportunities available in the economy and elsewhere, which are determined mainly by the private and collective actions of others.

Buonanno (2003) reviewed the literature on the socio-economic determinants of crime and found that any criminal behavior is influenced by several specific factors such as the difference between earnings from legal work versus illegal activities, income level, probability of arrest, and probability of punishment, level of education. Burdett, Lagos, and Wright (2002) lighted up the relationships between crime rate, inequality, and unemployment, making it possible to show how the crime rate affects the unemployment rate and vice versa.

Education

There is a close connection between education and crime. According to the data provided by the National Administration of Penitentiaries in Romania (NAP), the most

significant proportion of persons deprived of liberty enrolled in primary and lower-secondary education in the period 2008-2020 (Figure 1).



Figure 1. The situation of detainees enrolled in the school year, period 2008-2021, Romania (author processing based on data from the annual activity reports of NAP)

In the United States, 59% of federal prison inmates did not have a high school diploma in 1997 (Harlow, 2003). Ehrlich (1975) found a significant and positive relationship between the average number of school years followed by the adult population (over 25) and property crimes committed in the USA in 1960.

Studies such as the one conducted by Gould, Mustard, and Weinberg (2002) have shown that education increases pay, showing that investments in human capital and schooling should reduce crime. Lochner (2004) highlighted the role of education as an investment in human capital that increases future legal employment opportunities. Lochner also showed that there is an inverse causal relationship between crime and education. People who intend to get involved in criminal activities (because they are good at it, enjoy it, or live in areas with such opportunities) are likely to drop out of school at an early age.

Regarding the likelihood to drop out of school at an early age, data presented by World Bank shows that Romania and Colombia (two of the countries analyzed in this paper) dispute their first place with an average of 6.64% dropout rate in Romania and a 6.67% dropout rate in Colombia, during 2013-2018. On the other side of the rankings, Sweden and Lithuania (also used in our econometric model) have the lowest dropout rate, with less than 1% of middle school children not enrolled.



Figure 2. The average number of adolescents who dropped out of school (2013-2018). % of middle school children who are not enrolled (author processing based on World Bank data)

Igbinedion and Ebomoyi (2017) also found that the level of education is significant and negatively related to crime rates.

Unemployment and income inequality

Fleisher (1966) was the first to study the role of income on individuals' decision to commit criminal acts, stating that "the principal theoretical reason for believing that low income increases the tendency to commit a crime is that it raises the relative cost of engaging in legitimate activity". According to Fleisher, the effect of unemployment on juvenile delinquency is positive and significant, a statement easier to support when it comes to people over sixteen.

Fleisher (1966) and Ehrlich (1973) showed that the unemployment rate in a community is a complementary indicator of the income opportunities available in the legal labor market. However, both authors found that unemployment rates were less important determinants of crime rates than income levels in empirical studies.

Imrohoroglu, Merlo, and Rupert (2000) studied the relationship between inequality, redistribution, police spending, and the crime against property, showing a positive correlation between inequality and crime, a positive correlation between police spending and redistribution, and the lack of correlation between crime and redistribution.

Sjoquist (1973) demonstrated that there is a positive effect of unemployment on property crimes. According to Imrohoroglu, Merlo, and Rupert (2000), the effect of unemployment on property crimes is negligible. Their study showed that increased inequality had prevented an even more significant crime reduction, with 79% of people involved in criminal activities employed and only 21% unemployed. When studying the determinants of crime in Nigeria, using the error-correction modeling approach for 1981-2015, Igbinedion and Ebomoyi (2017) indicated that "the twin macroeconomic problems of inflation and unemployment positively impact crime rate in Nigeria". They also showed that the average income is "significant and negatively

related to the crime rate, suggesting that, appreciable increase in per capita income tends to reduce the incentive to commit the crime".

Morality

It is likely that, in the case of the rich, an increase in inequality will not lead them to commit more crimes. However, in the case of the poor, an increase in inequality can lead to crime since it implies a notable difference between the wages of the poor and those of the rich, reflecting a more significant difference between income from criminal and legal activities. An increase in inequality can also have a crime-inducing effect by lowering the moral threshold of the individual through what we might call the "envy effect" (Buonanno, 2003).

According to a study conducted by PricewaterhouseCoopers (2016), "opportunity" is the essential factor contributing to committing economic crimes by people inside the participating institutions. Corruption is one factor found in literature as an essential determinant of financial crime. Individuals that developed their activity at law edge or even by breaching it obtaining high profits created then immunity and got power by "buying" political positions, the risk of money laundering being correlated to corruption (Achim & Borlea, 2020). According to Duţulescu & Nişulescu-Ashrafzadeh (2016), only in 4 counties from Romania, the average punishment for corruption was higher than 40 months (Ilfov - 44.09 months, Galaţi - 41.57 months, Gorj - 40.86 months, and Constanţa - 40.1 months).

Data and methodology

Following the results obtained by reviewing the literature, we wanted to show the role of social and psychological dimensions in studying the economy of money laundering through an empirical study. Our study is based on an unbalanced panel constructed for 21 countries, namely Armenia, Austria, Canada, Columbia, Denmark, Finland, Germany, Hungary, Italy, Lithuania, Netherland, Poland, Portugal, Romania, Russia, Serbia, Singapore, Slovakia, Sri Lanka, Sweden, and Switzerland for the period 2013-2018. The outcome variable is represented by the money laundering crime rate of a country *s* in a given year *t*, constructed as:

$$ML_rate_{st} = \frac{ML_{st}}{POP_{st}}$$

 ML_{st} is the number of money laundering crimes for the unit observation, and POP_{st} is the country's total population per 1 million population.

Data on money laundering crime was available through the United Nations Office on Drugs and Crime and the General Inspectorate of the Romanian Police database. At the same time, data on population numbers have been extracted from the World Bank database.

For each country and year of observation, we considered five explicative variables as shown in Table 1.

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Variable	Туре	Factor	Interpretation	Source	
Emotional well-being	score	A proxy for the prosperity of country	Values between 0 (no prosperity)	Legatum Institute	
Education level of the adult population	score	residents	and 1		
Unemployment	score				
Fiscal health	index	Average deficits as a percentage of GDP and debt as a percentage of GDP proxy for the health of the tax system	Values between 0 and 100 (no fiscal health)	The Heritage Foundation	
Corruption perception Index	index	Perceived levels of public sector corruption, a proxy for morality	Values between 0 (extreme corruption) and 100 (no corruption).	Transparency International	

Table 1. The independent variables, proxies for socio-economic factors

These five explicative variables were used to capture the influencing socio-economic factors of money laundering crime rates in the 21 countries selected during 2013 and 2018.

Considering the empirical studies found in the literature regarding the determinants of property crime, we expected education, unemployment, and corruption to be the determinants of money laundering crime.

Since we managed to find data that measured emotional well-being and fiscal health, we also expected to find a correlation between these factors and the financial crime rate, starting fromRyff's multidimensional model of psychological well-being. According to Ryff (2014), well-being is made up of six core dimensions: (1) "*purpose in life* - the extent to which one feels their lives had meaning, purpose, and direction; (2) *autonomy* - whether people view themselves to be living in accord with their convictions; (3) *personal growth* - extent to which people are making use of their talents and potential; (4) *environmental mastery* - how well people are managing their life situations; (5) *positive relationships* - the depth of connection people had in ties with significant others; (6) *self-acceptance* - the knowledge and acceptance that people have of themselves, including awareness of personal limitations".

Among the six variables, Unemployment, Fiscal Health, and the outcome variable have been log-transformed to account for the normal distribution of the residuals.

With the number of the countries (N) used in our model greater than the number of time observations (T) and T small, our panel data does not raise non-stationary issues (Baltagi, 2008). Therefore we did not test the stationarity of the series.

Research results

We have tested the model for cross-section (individual) and time effects for the correct specification of the regression and proper inference.

The model has been tested to select the most appropriate model: No Effects (Pooled Least Square (PLS)), Fixed-Effects or Random-Effects panel data model, using Eviews. The results highlighted that the appropriate model for our data is the Random-Effects panel data model, as shown in Figure 3.

				Lagrange Multiplier Tests for Random Effects Null hypotheses: No effects Alternative hypotheses: Two-sided (Breusch-Pagan) and one-side (all others) alternatives				
Redundant Fixed Effects Tests				Cross-sec	Test Hypothesi Cross-section Time		s Both	
rest cross-section fixed effects				Breusch-Pagan	183.805 (0.0000	5 2.1) (0.	62896 1414)	185.9684 (0.0000)
Effects Test	Statistic	d.f.	Prob.	Honda	13.5574 (0.0000)	9 -1.4	70679	8.546667 (0.0000)
				King-Wu	13.5574	9 -1.4	70679	4.747679 (0.0000)
Cross-section F Cross-section Chi-square	26.274147 229.443886	(20,98) 20	0.0000	Standardized Honda	15.5797	1 -1.2	95530	6.143226 (0.0000)
				Standardized King-Wu	15.5797 (0.0000)	1 -1.2)	95530	2.361569 (0.0091)
				Gourierioux, et al.*				183.8055 (< 0.01)
Correlat Equatio Test cro	ted Random Effects n: EC_MODEL ss-section random (- Hausm effects	an Test	i.				
Test Su	mmary			Chi-Sq. Statistic Chi	-Sq. d.f.	Prob.		
Cross-s	ection random			7.659061	5	0.1761		

Figure 3. Results of Fixed-effects tests, Lagrange Multiplier Tests for Random effects and Hausman Test

The Hausman test showed that the random effects are uncorrelated with the explanatory variables, an additional reason to consider that the appropriate model is the Random-Effects model. We decided over the Random-Effects model to control dependencies of unobserved, independent variables on a dependent variable. When estimating the model with random effects, we followed the recommendations from the literature (Baltagi, 2008), and we built the model using all of the three estimation methods: Wallace and Hussain, Wansbeek, and Kapteyn, but also Swamy and Arora. The purpose was to test the stability of the model constructed, given the small number of time observations that may lead to results significantly different.

The results showed no significant differences regarding the independent variables' coefficients (Figure 4), a sign of our econometric model stability.

rependent randole. EUG_mL_UV lethod: Panel EGLS (Cross-sectio)ate: 05/24/21 Time: 15:31 :ampte: 2013 2018 'endos included: 1 ross-sections included: 21 total panel (unbalanced) observat Vansbeek and Kapteyn estimator	ions: 124 of component	ects) variances			Jependent varia lethod: Panel E Date: 05/24/21 Sample: 2013 20 Periods included Cross-sections i Total panel (unb Vallace and Hus	IDIE: LOG_ML_ GLS (Cross-se Time: 15:25 018 1: 6 Included: 21 alanced) obse ssain estimato	NATE ection random eff rvations: 124 r of component v	ects) ariances			
Variable	Coefficient	Std. Error	t-Statistic	Prob.	Var	iable	Coefficient	Std. Error	t-Statistic	Prob.	
C LOG_UNEMPLOYMENT EDUCATION_LEVEL_OF_ADULT LOG_CPI LOG_FISCAL_HEALTH EMOTIONAL_WELLBEING	-4.757300 0.983757 2.367083 -0.174862 1.014806 -2.304182	4.751187 0.442021 1.692079 1.057061 0.251082 1.367345	-1.001287 2.225590 1.398920 -0.165423 4.041729 -1.685150	0.3187 0.0279 0.1645 0.8689 0.0001 0.0946	LOG_UNE EDUCATION_LE LOG LOG_FISC EMOTIONAL	C MPLOYMENT EVEL_OF_ADU S_CPI AL_HEALTH _WELLBEING	-8.680965 0.983019 ILT 2.611778 0.704331 1.025951 -2.104483	3.513086 0.395667 1.513616 0.749621 0.235076 1.245752	-2.471037 2.484460 1.725522 0.939583 4.364335 -1.689327	0.0149 0.0144 0.0871 0.3494 0.0000 0.0938	
	Effects Spe	ecification	S.D.	Rho			Effects Sp	ecification	S.D.	Rho	
cross-section random diosyncratic random			2.212261 0.581375	0.9354 0.0646	Cross-section ra diosyncratic ran	indom dom			1.352182	0.8593 0.1407	
	Weighted	Statistics					Weighted	Statistics			
t-squared .djusted R-squared i.E. of regression -statistic 'rob(F-statistic)	0.205559 0.171896 0.561697 6.106427 0.000046	Mean depend S.D. depende Sum squared Durbin-Watse	tdent var -0.206600 Jent var 0.617599 ed resid 37.22942 son stat 1.548090		R-squared djusted R-squa E. of regressio -statistic Prob(F-statistic)	ired n	0.202479 0.168686 0.586429 5.991692 0.000056	Mean dependent var S.D. dependent var Sum squared resid Durbin-Watson stat		-0.315635 0.643951 40.58009 1.416453	
	Unweighter	d Statistics					Unweighte	d Statistics			
}-squared ium squared resid	0.076744 282.3531	Mean depend Durbin-Wats	dent var on stat	-1.913750 0.204122	2 - Squared 0.229434 Mean dependent var 3um squared resid 235.6571 Durbin-Watson stat			dent var on stat	-1.913750 0.243913		
	Date: 05/2 Sample: 2 Periods in Cross-sec Total pane Swamy an	4/21 Time: 1 013 2018 cluded: 6 ctions include (unbalance) d Arora estim	5:31 d: 21 d) observati lator of com	ons: 124 ponent varia	inces						
		Variable		Coefficient	Std. Error	t-Statistic	Prob.				
	LOG EDUCATIO LOG EMOTI	C _UNEMPLOYI ON_LEVEL_C LOG_CPI _FISCAL_HE IONAL_WELL	MENT DF_ADULT ALTH BEING	-8.994832 0.980047 2.645156 0.771174 1.026871 -2.085092	3.640968 0.417534 1.596832 0.772813 0.249562 1.317640	-2.470451 2.347228 1.656503 0.997879 4.114698 -1.582444	0.0149 0.0206 0.1003 0.3204 0.0001 0.1162				
				Effects Sp	pecification	S.D.	Rho				
	Cross-sec diosyncra	tion random tic random				1.377599 0.581375	0.8488 0.1512				
				Weighte	d Statistics						
	-squared \djusted R-squared \$.E. of regression ⁻-statistic Prob(F-statistic)			0.202870 0.169093 0.589715 6.006209 0.000055	Mean depend S.D. depende Sum squared Durbin-Watso	dent var ent var 5 resid on stat	-0.328756 0.647772 41.03618 1.400695				
				Unweighted Statistics							
	R-squared Bum squa	d ired resid		0.237715 233.1243	Mean depend Durbin-Watso	dent var on stat	-1.913750 0.246560				

Figure 4. Results of the estimated equation

The results of the panel data regression model with random effect constructed indicated that 20% of the money laundering crime rate variation is explained by unemployment, education, corruption, well-being, and fiscal health (debt pressure). Out of the five independent variables, the proxy variables for unemployment and fiscal health are significant at a 95% confidence level. The results showed that an increase of one percent in the unemployment score would lead, on average, to a 0.98 percent increase in the money laundering crime rate. In contrast, a one percent increase in the health tax system index leads to an average of 1.01 percent increase in the financial crime rate, with the other factors remaining constant.

Results have shown that the coefficient of the proxy variable used for emotional wellbeing is significant only if we consider a 10% level of significance. Regarding the score and index used as a proxy for education and corruption, the parameters attached proved to be statistically insignificant. Subsequently, we tested whether or not it is reasonable to assume that the random errors inherent in the process have been drawn from a normal distribution using the Jarque-Bera test. The results showed that random errors are normally distributed (Figure 5).



Figure 5. Testing residuals normality

We have also performed a residual cross-section dependence test. Since the number of time observations used is small, we focused on the asymptotically standard normal Pesaran CD test results, presented in the final line of the table shown in Figure 6.

Residual Cross-Section Deper Null hypothesis: No cross-sect Equation: EC_MODEL Periods included: 6 Cross-sections included: 21 Total panel (unbalanced) obse Note: non-zero cross-section n Test employs centered correlat	ndence Test tion dependence (correla rvations: 124 neans detected in data tions computed from pai	ation) in re rwise san	siduals nples
Test	Statistic	d.f.	Prob.
Breusch-Pagan LM	367.8557	210	0.0000
Pesaran scaled LM	6.677875		0.0000
Pesaran CD	-0.858940		0.3904

Figure 6. Testing for cross-section dependences in residuals

The Pesaran CD test results showed that we could accept the null hypothesis at the conventional significance levels of 5%. Therefore, we can conclude that there is no cross-section correlation in residuals, the disturbances in our panel data model being cross-sectionally independent.

Conclusions

This paper showed that various social and psychological factors influence financial crime in the form of money laundering. According to the empirical study we performed, money laundering crime rates, unemployment, and the tax system's health are positively correlated in an international context. This information might help (once again) the governments better understand the importance of investments; investments lead to job creation, which reduces unemployment and might reduce the money laundering crime rate.

In this study, we also found that increasing emotional well-being lowers the crime rate of money laundering at a 10% level of significance. Therefore, we can argue that it might be possible to reduce the money laundering crime rate by helping people obtain a purpose in life, autonomy, increase personal growth, self-acceptance and build positive relationships

Contrary to previous research in property crime, our results showed that education and corruption do not determine the money laundering crime rate; the education score and the corruption index are not statistically significant.

The study performed in the present paper has its limitations because data regarding money laundering rates are challenging to collect. Therefore, our endeavors will continue with the aim to increase the number of country observations, further test this research's conclusions, and maybe even expand the number of socio-economic determinants of money laundering.

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