Illegal activities of financial intermediaries: A burden of trust crisis

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Abstract. Based on the explication of structural and functional relations, a scientifically methodical approach to modeling the relationship between financial intermediaries' illegal activities, the trust crisis in the financial sector, and its deformations have been developed. Based on the construction and analysis of the relevant structural equations, it has been empirically confirmed that the probability of financial intermediaries' involvement in shadow transactions increases with the aggravation of the trust crisis in the financial sector. Using the tools of the structural equations modeling, a mediator analysis was performed,

the results of which confirmed the hypothesis that the financial sectors' trust crisis contributes to the degeneration of financial institutions and markets with regard to their depth, access, security and efficiency, which, accordingly, results in higher shadow transactions involving financial intermediaries.

1. INTRODUCTION

In the history of development economics, shadow banking has been thought of as a key factor in increasing anxiety and negative sentiments about many countries' current financial and economic position, especially OECD. It is now well established from a variety of studies that in the majority of cases, shadow banking is linked to corruption, institutions quality, and money laundering that resulted in the run-up to national and global economic and financial crises. Despite numerous studies that have attempted to explain and explore the size, consequences, causes, and problems generated by shadow banking, understanding mediation pathways in financial intermediaries' illegal activities are rather limited.

Since the illegal activities of financial intermediaries are less regulated and, therefore, less supported and protected by the central banks, it is too fragile to the effects of behavioral market sentiment. The roots of involving financial intermediaries in shadow transactions could be reflected by banking and other financial institutions running outside of the regulated banking sector while eroding trust in the financial system. This paper explores the influence of the trust crisis in the financial sector on financial intermediaries' illegal activities, enabling to describe the logic behind the increasing involvement of financial banking and non-banking financial institutions in shadow transactions.

The identified research gap is linked to the lack of knowledge regarding the underlying root causes for financial intermediaries' engagement in illegal activities. This undertaken study aims to make an original contribution to research by exploring and measuring the link between trust crisis in the financial sector and illegal activities of financial intermediaries. Besides, a mediating variable - financial sector deformations - was incorporated, and its mediational pathway in the relation between a trust crisis in the financial sector and illegal activities of financial intermediaries was investigated. Diverse responses of the financial sector help identify the impact of the trust crisis in it and give an opportunity to clear up the transmission channel of the degradation of financial institutions and markets related to their depth, access, and efficiency under the influence of the trust crisis on illegal activities of financial intermediaries.

The remainder of the paper is the following: Second session review existed literature on the issues concerning illegal activities of financial intermediaries and a trust crisis in the financial sector. The literature review results are used as a conceptual background for the developing theoretical model for structural interdependencies and hypothesis development in Section 3. Section 3 continues by describing the research methodology in terms of data collection procedure and measure of latent constructs, model specification, and sample size. Research results for measurement, structural and mediating models, hypothesis testing, and discussion are then presented in Section 4. Section 4 ends by model fit measuring. Finally, Section 5 summarizes the findings and concludes.

2. LITERATURE REVIEW

A large and growing body of published studies describe consequences of the black markets (Williams, 2001, Bouazizi, 2020) existence or the shadow economy (Yoshimori, 2019, Zolkover et al., 2020, Nguyen et al., 2020) and shadow banking (Singh et al., 2011, Plantin, 2014, Moreira et al., 2017).

Questions have also been raised about supporting and facilitating illicit financial flows by the banking sector. In particular, one leading conceptual problem that has dominated the academic literature over a long time refers to the impact of illicit financial flows on the macroeconomic situation. Based on the HSBC Swiss bank's case study, Naheem (2018) demonstrated how banking institutions were connected to illicit financial flow movements through their clients. In this case, financial intermediaries could facilitate different types of illegal financial activities such as money laundering, tax evasion, corruption, bribery, capital flight, and financial resources movement out of economies through illicit financial flows. It was shown that a primary route by which financial intermediaries can be used as a conduit to support illegal activities is protecting client confidentiality. It was also observed that there were various means to complicit in illegal activities of financial intermediaries, supporting illicit financial flows, especially formal commercial banks.

In an equally considerable case study conducted by Chernykh and Mityakov (2017) based on mandatory banks' financial statements to the Central Bank of the Russian Federation, the offshore-banking index has been developed. It was found that the primary activities of banks, which engage in illegal activities, are directed more specifically towards international wire transfers and smaller extent financial intermediation. Moreover, it was empirically supported that offshore activities of banking institutions and tax evasion of corporations closely connected to these banking institutions positively correlate. The research results also show that banking institutions actively involved in offshore activities are most often under initiated by the Central Bank a criminal investigation against their top managers and, eventually, the activities of these banks are likely to have been seen as illicit, and the process of license revocation would take place.

The second strand of the illegal activities of financial intermediaries literature focuses on its size and scale. Illegal activities of financial intermediaries, by their very nature, are sheltered from sight and therefore hard to identify, and indeed to measure and aggregate. Nevertheless, some attempts in the economics literature have been made to develop methods to measure informal activities (Boyko et al., 2014, Medina et al., 2018, Petrushenko et al., 2018, Levchenko et al., 2019, Yarovenko, 2020). Different authors have measured illicit financial flows in a variety of ways. Balance-of-payment statistics (Kar et al., 2009, Johannesen et al., 2016), Trade Price Deviation Analyses (Zdanowicz, 2009), Transfer Price Analyses (Bernard et al., 2006), International Portfolio and Deposit Data (Zucman, 2013), Deviations from Traditional Gravity Models of Financial Flows (Perez et al., 2012), The Walker Model (Walker, 1999, Walker et al., 2009) have been used in the past to determine and investigate the informal activities, including financial intermediaries involvement in shadow transactions. Particular attention should be paid to the construction of indexes used as a proxy for measuring illicit financial flows, such as The Financial Secrecy Index (FSI) and The Basel Anti-Money-Laundering Index. They are based on subcategories and represent different risks associated with money laundering or terrorist finance, corruption, political and legal risk, etc.

Another strand of the scientific literature analyzes the drivers of illegal activities. Considering all of this evidence, it emerges that shadow financial transactions have been caused by a complex interplay of structural factors that are related to underground economic activities in general, as well as weakening governance and institution development (bribery and public theft), undermining financial systems, economic distortions, and unique symbiotic relationships (Kar, 2010, Kar et al., 2013, Rao, 2013).

Cong and Chen (2018) made significant contributions and new perspectives regarding the roots of financial intermediaries' illegal activities. Based on a dynamic general equilibrium framework that is widely adopted in financial intermediaries' investigations, they had explored the pathway whereby confidence

influence shadow banking. Over the past several years, there has been more attention in a large volume of published studies to be paid on the role of human capital (Bryl, 2020, Railaite & Čiutienė, 2020), financial literacy (Gavurova et al., 2019, Dewi et al., 2020), economic agents` decisions under uncertainty (Civljak, 2019, Silva et al., 2019), customers' loyalty (Esmaeili et al., 2021), trust (Nor Zaini et al., 2017, Oláh et al., 2017, Brychko et al., 2019, Oláh et al., 2019, Bappayo et al., 2019, Çera et al., 2019, Ryciuk & Nazarko, 2020). However, the pressure of the trust crisis in the financial sector on involvement of financial intermediaries in illegal activities was surprisingly neglected by modern research.

The evidence reviewed so far as well as empirical findings, and conclusions of other academic research may suggest a pertinent role for government interventions in promoting financial sector development (Kozmenko et al., 2011, 2014, 2016, Bilan et al., 2019a), including combating illegal activities of financial intermediaries (Geiger et a., 2007, Benson, 2020), creating and maintaining trust among the stakeholders of the financial sector (Tomasic et al., 2011, Capie, 2015, Horne, 2017), and not only macroeconomic stabilization (Lyulyov et al., 2017, Bilan et al., 2019b).

3. METHODOLOGY

3.1. Theoretical model and hypothesis development

Based on the evidence available in the literature mentioned above, a conceptual framework we developed. The structural equation model for the evaluation of illegal activities of financial intermediaries is expressed in Figure 1.
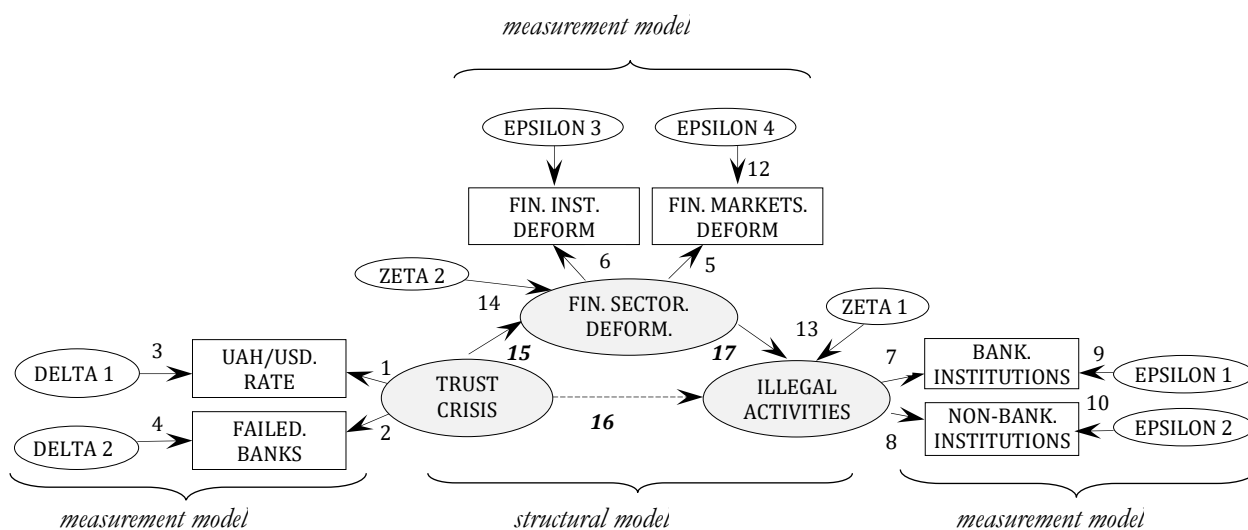
Figure 1. The proposed conceptual model with observed variables and latent constructs (hypothetical interaction of variables)
Source: Author's elaboration

To test the direct and mediated linkage between illegal activities of financial intermediaries and trust crisis in the financial sector, the following theoretical hypotheses based on the adopted constructs have been developed:

H1: The trust crisis in the financial sector encourages financial intermediaries' illegal activities (direct effect model).

H2: The trust crisis in the financial sector caused the deterioration of financial institutions and markets in matters of their depth, access, and efficiency (H2a), which, accordingly, leads to an increase in shadow transactions involving financial intermediaries (H2b) (mediation effect model).

The proposed conceptual model consists of two submodels. The first submodel is called the measurement model and represents relationships between the multilayered, complex latent constructs and multiple observed indicators that define them. The second submodel in scientific literature referred to as the structural model reflects relationships among the multilayered, complex latent constructs by specifying the direct or indirect effect on endogenous (dependent) latent variables caused by of exogenous (independent) latent variables. Thus, the modeling of the direct and mediated effect by applying a system of structural equations comprises of three constituent parts: (1) by means of confirmatory factor analysis (CFA) to validate the measurement model, (2) fitting the structural model accomplished by path analysis, (3) measurement mediation effect model and its support through the Sobel method. Systems of regression equation approaches were chosen to study the causal structural relations among observed variables and latent constructs and test the theoretical hypotheses in the proposed conceptual research model. Structural equation modeling offers an effective way of understanding abstract concepts. This leads to SEM dissemination in social studies (Atef et al., 2017, Lekovic & Bobera, 2018, Alyoubi et al., 2019, Alsua et al., 2019, Muneeb et al., 2019, Akhondzadeh, 2019, Sadiq et al., 2020), including trust (Al Halbusi et al., 2018, Mas'ud et al., 2019). STATISTICA 13.3 was selected for confirmatory modeling and PATH analysis, as well as testing for its reliability and validity.

3.2. Data collecting procedure and latent constructs measurement

The theoretical measurement model incorporates three latent constructs, one of which is exogenous - trust crisis in the financial sector, and two endogenous latent constructs, including illegal activities of financial intermediaries and financial sector deformation (see Figure 1 for the theoretical measurement model). Illegal activities of financial intermediaries as a hidden element of the national economy are difficult susceptible to quantify. Therefore, in order to approximate the extent of the illegal activities of financial intermediaries, multiple observable indicators should be used. The latent construct of financial intermediaries' illegal activities is approximated using the two reflective indicators given in Table 1.

Financial sector deformation is a second endogenous multilayered, complex latent construct that cannot be directly observed and measured. As an alternative to direct measurement, observed indicators that are served as indirect measurements of the financial sector deformation are used in the study. Financial sector deformation is reflected by the degradation of financial institutions (FIN.INST.DEFORM) and markets (FIN. MARKETS.DEFORM) regarding their depth, access, and efficiency.

At the same time, others have highlighted the relevance of only one side of the financial system deformation characteristics such as efficiency (Brychko et al., 2011, Savchenko et al., 2014, Djalilov et al., 2015, Rekunenko, 2017, Kliestik et al., 2018, 2020a, 2020b, Adewole et al., 2019, Kovacova et al., 2019), quality (Kuzmenko et al., 2014, Vasilyeva et al., 2016, Khan et al., 2020), depth (Buriak et al., 2015), the quality and depth of financial intermediation (Kozmenko at el., 2009, 2012, Atef et al., 2017). A broader perspective has been adopted by Gospodarchuk et al. (2019), Korzeb et al. (2020), who equate financial development to financial stability or resilience of financial institutions or systems in general. In this study, a group of crucial observed indices is selected to encompass various dimensions of the financial system deformation. As proxies for the degradation of financial institutions (FIN.INST.DEFORM) and markets (FIN. MARKETS.DEFORM) were used indexes that are inversely proportional to the level of Financial Markets index (F.M.) and Financial Institutions index (F.I.) respectively. This index was firstly presented in IMF Staff Discussion Note "Rethinking Financial Deepening: Stability and Growth in Emerging Markets"

(Sahay et al., 2015). Subsequent research by Svirydzenka (2016) revealed furthermore in-depth explanation of the methodology that underpins indexes that characterize the country's financial development.

Table 1

Latent construct and observed indicators used in the conceptual model

Latent construct	Observed indicators		Source
	Variable	Label	
Illegal activities of financial intermediaries (ILLEGAL ACTIVITIES)	Suspicious transactions subject to AML/CFT monitoring reported by banking institutions	BANK. INSTITUTIONS	State Financial Monitoring Service of Ukraine
	Suspicious transactions subject to AML/CFT monitoring reported by non-banking institutions	NON-BANK. INSTITUTIONS	
Trust crisis in the financial sector (TRUST CRISIS)	The exchange rate hryvnia (UAH) to American Dollar (USD) in the interbank foreign exchange market	UAH/USD. RATE	National bank of Ukraine
	Number of problem and insolvent banks, that under the process of revoking the banking license by the National bank of Ukraine and liquidation	FAILED. BANKS	
Financial sector deformation (FIN.SECTOR. DEFORM)	Degradation of financial markets (The value of the index is inversely proportional to the level of Financial Markets index (F.M.))	FIN. MARKETS. DEFORM	IMF data (Financial Development Index Database)
	Degradation of financial institutions (The value of the index is inversely proportional to the level of Financial Institutions index (F.I.))	FIN. INST. DEFORM	

Source: Composed by the authors.

In this regard, these indexes reflect the atrophy of financial markets and financial intermediaries, but neither its main driving forces of degeneracy (institutional insecurity, regulatory inefficiency, etc.) nor their consequences (financial instability, volatility, risks). Financial market degradation is based on the key features of the stock market and debt market deformations with regard to depth, access, and efficiency. Simultaneously, financial institutions' degradation is more bank-specific. The rationale for using financial development sub-indexes as a proxy relies on previous studies on the subject matter such as Katircioğlu et al. (2017), Sobiech (2019), Khan et al. (2019), Cheng et al. (2020).

The proposed structural equation model allows multiple observed indicators to be associated with a trust crisis in the financial sector. Thus, an exogenous latent construct which is trust crisis in the financial sector referred as TRUST CRISIS reflected as a devaluation of the hryvnia against the American dollar (UAH/USD.RATE) and the number of problem and insolvent Ukrainian banks, that under the process of revoking the banking license by the National bank of Ukraine and liquidation (FAILED.BANKS). In view of the deficiencies in trust (confidence) indexes that have shown considerable growth in empirical research (Earle, 2009, Stevenson et al., 2011, Oláh et al., 2017, 2019, Park, 2020), this study used an approach developed by Bilan et al. (2019c) and Brychko et al. (2020). In the same vein, the latent construct for the financial sector's trust crisis incorporates indicators that display negative news about financial institutions and financial markets destabilization, consequently eroding trust in the financial system. Since the investment decisions of economic agents in Ukraine had been primarily predicated on the exchange rate between Ukrainian hryvnya and the United States dollar, the national currency's devaluation against the U.S. dollar (UAH/USD.RATE) was used as a proxy. The number of problem and insolvent Ukrainian banks, that under the process of revoking the banking license by the National bank of Ukraine and liquidation (FAILED.BANKS) was used as a second proxy for the trust crisis in the financial sector. This proposal's primary rationalization is related to a weak system for protecting depositors' rights, especially legal entities in Ukraine. Thus, the Central bank's decision to introduce the temporary administration in commercial

banks is treated by economic agents as the first step of their liquidation, bringing trust in the financial system in general to their lowest levels.

In order to test the developed hypotheses, the following sources were used for the data collection. From the State Financial Monitoring Service of Ukraine database, the data for the first endogenous latent (non-observed) construct, i.e., illegal activities of financial intermediaries, for which suspicious transactions subject to AML/CFT monitoring reported by banking institutions and non-banking institutions were used as proxies, were sourced for the 2011-2018 period. The data for the second endogenous latent (non-observed) construct that is financial sector deformation, for which degradation of financial institutions and markets in terms of their depth, access, and efficiency were used as proxies were sourced from IMF data (Financial Development Index Database) for the same period 2011-2018. For the independent latent construct that is trust crisis in the financial sector, for which the exchange rate hryvnia (UAH) to American Dollar (USD) in the interbank foreign exchange market and the number of problem and insolvent Ukrainian banks, that under the process of revoking the banking license by the National bank of Ukraine and liquidation, the data was sourced from the National bank of Ukraine reports for the 2011-2018 period.

3.3. Model specification and sample size

The model specification should be started from the visualization of the proposed conceptual model graphically using the path diagram. Figure 1 express in the convenient visual form hypothesized relations among trust crisis in the financial sector and illegal activities of financial intermediaries (direct effect model), trust crisis in the financial sector and illegal activities of financial intermediaries via the degradation of financial institutions and markets (mediating (indirect) effect model), and other complex relationships among observed variables and latent constructs (measurement models). The path diagram represented in Figure 1 helps to deal with miss-specified models (Diamantopoulos, 1994, Diamantopoulos et al., 2000). This was achieved through a graphical depiction of the hypothetical interaction of variables that could be potentially excluded, links, and dependencies omitted (Diamantopoulos, 1994).

Model specification implies determining which parameters are fixed by the program independently or by the researcher to a constant, which are free, and therefore, should be estimated, and what the relationships are between selected variables. The model contains the three latent (non-observed) constructs hypothesized in the structural equations model and six observed parameters that are combined into the corresponding latent constructs. An error term (EPSILON 1-4, DELTA 1-2) for each of the observed variables was incorporated. Since, each observed variable was integrated into a single latent construct, any cross-loadings in not allowed. In the proposed conceptual model, any covariance between error terms across observed variables was excluded. The justification for cross-loading neglecting is based upon the absence of empirical evidence in the literature to the contrary. Thus, EPSILON 1-4 and DELTA 1-2 describe variances and linkages that was not explained in the conceptual model, and in empirical studies were named as 'errors in measurement'. While ZETA 1-2 are 'errors in equations' and constitute disturbances of structural equations.

Parameters estimation cannot be conducted without determining path coefficients and factor loadings, which together constitute targeted effects. In the path diagram (see Figure 1) targeted effects are denoted by directional arrows ($\rightarrow$). Directional arrows from latent (non-observed) variables to observed parameters (shown in Figure 1 by arrows 1–2, 5–8) stand for factor loadings. Directional arrows 15–17, that depict the linkages between the non-observed variables, are referred as path coefficients. Thus, free directional effects are subjects to quantification from the empirical data with STATISTICA. Overall, the 17 model parameters (nine directional effects, including three path coefficients and six factors' loadings, and eight variances) outlined in the path diagram (Figure 1) were intended for estimation.

Before conducting SEM, the proposed conceptual model visualized by the path diagrams should be adequately identified. According to Ullman (1996) and Woody (2011), parameters estimation is possible only if the model is over-identified or just identified. This means that for each structural model parameter with unknown values there is scope to fit unique estimates. To be adequately identified, the model must have degrees of freedom greater than 0 (Raykov et al., 2000). The degrees of freedom are determined as the amount that is obtained as deduction of a number of parameters to be estimated from a number of non-redundant elements in the sample correlation matrix. The proposed model, proceeding from six observed variables, in the sample correlation matrix had 21 non-redundant elements. Considering 17 parameters intended for estimation, the degrees of freedom are positive. The hypothesized conceptual model is thus considered to be overidentified. This fact illustrates the sufficiency of provided empirical information and, therefore, the ability for each parameter with unknown values in the model to identify the one best estimate.

4. EMPIRICAL RESULTS AND DISCUSSION

4.1. Measurement model

The estimation technique should be implemented in order to obtain numerical values for factor loadings, factor variances, covariances, together with manifest error variances and manifest error covariances, presented in the proposed conceptual model as free parameters. The following action of the free parameters estimate entails iterative procedures that ensure minimization of the margin obtained as subtraction of the model implied covariance matrix from the sample covariance matrix. In many empirical studies, the method of generalized least squares, weighted least squares and maximum likelihood have been applied for structural equation models parameters estimation (Alnsour, 2018, Hu et al., 2019, Victor et al., 2019, Indartono et al., 2019, Nazneen et al., 2020). However, the chosen parameter estimation method is not crucial since it produced estimates convergence to the same numerical values in case correctly specified theoretical model and multivariate normal observed variables.

Before analyzing the structural model, a confirmatory factor analysis (CFA) was conducted first to consider the fit of the measurement model to the empirical data as well as assess its reliability. The measurement models' outcomes are depicted in Figure 2, which encapsulates the standardized factor loadings and measures of the final measurement models' reliabilities.

Financial intermediaries' illegal activities ensure the growth of suspicious transactions subject to AML/CFT monitoring reported by banking institutions over time. A positive relationship is also obtained between illegal activities of financial intermediaries and suspicious transactions subject to AML/CFT monitoring reported by the non-banking institution. Thus, the expansion of illegal activities of financial intermediaries at 1.000 p.p. yields the rise in the volume of suspicious transactions subject to AML/CFT monitoring reported by banking and non-banking financial institutions by 0.335 and 0.854 pp., accordingly. An unanticipated finding of such sizable response of the changes in the volume of suspicious transactions subject to AML/CFT monitoring reported by non-banking financial institutions presented the stark warning of the comparative bounded regulatory impact of the National bank of Ukraine on insurance companies, investment funds, and credit units' activities.

(a) Illegal activities of financial intermediaries

(b) Financial sector deformation

(c) Trust crisis in the financial sector
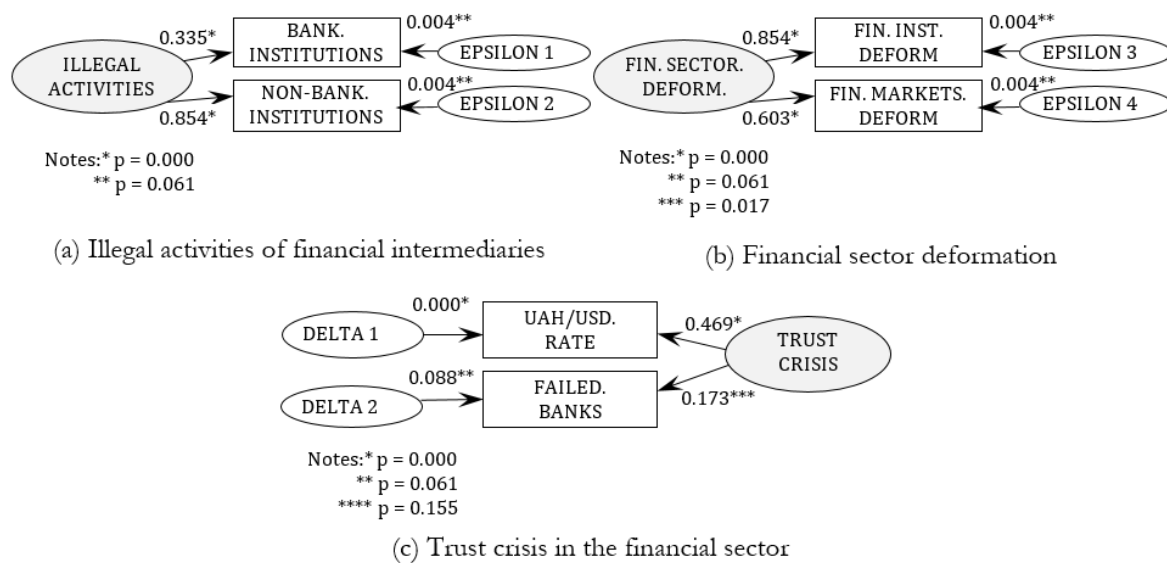
Figure 2. Output path diagrams for the measurement model
Source: Authors' results visualization

Measurement model analysis has revealed several interrelations that may be accused of financial sector deformations (see Figure 2b). Thus, an increase in the financial sector deformations per unit resulting in worsening trends of financial institutions and markets degradation with regards to depth, access, and efficiency respectively by 0.854 and 0.603 p.p. It is worth noting that the degradation of financial institutions is the most in relative terms responds to the financial sector deformations. Thus, decreasing private-sector credit, pension, and mutual fund assets, insurance premiums, life and non-life to GDP, as well as financial institutions deformations from access and efficiency (efficiency in intermediating savings to investment, operational efficiency and profitability measures) perspectives stemming from a low level of financial sector development in Ukraine.

According to the obtained results depicted in Figure 2c, any escalation of the trust crisis in the financial sector causes sharp depreciation of the hryvnia (UAH) to the American dollar (USD) in the interbank foreign exchange market and an increase in the number of problem and insolvent Ukrainian banks, that under the process of revoking the banking license by the National bank of Ukraine and liquidation. The measurement models' outcomes demonstrate that the parameter estimated for the exchange rate of hryvnia (UAH) to the American dollar (USD) is the highest (0.469) among all observed variables for latent construct. This finding proves that the exchange rate of the hryvnia (UAH) to the American dollar (USD) is extremely fragile; this also accords with the authors` previous empirical findings (Brychko et al., 2020). This outcome explicates anomalous currency fluctuations caused by economic agents' panic sentiment on financial markets resulted in a trust crisis in the financial sector.

4.2. Structural model and first hypothesis testing

Path analysis was done for structural model estimation. Table 2 displays the outcomes of the structured model (results of path analysis) with standardized parameters. The relationship between two predictors, i.e., the trust crisis in the financial sector as the independent latent construct, the financial sector deformation as the mediator, and the illegal activities of financial intermediaries as the dependent latent construct, is determined by the proposed structural model. The proposed conceptual model hypothesizes that the illegal activities of financial intermediaries and the trust crisis in the financial sector are, directly and indirectly,

interrelated and mediated by the degradation of financial institutions and markets with regards to their depth, access, and efficiency.

Table 2

Results of the structural model

Paths			Estimates	SE	T-statistics	p-value
TRUST CRISIS	15	FIN.SECTOR.DEFORM.	0,603	0,253	2,380	0,017
TRUST CRISIS	16	ILLEGAL ACTIVITIES	0,699	0,200	3,492	0,000
FIN.SECTOR.DEFORM.	17	ILLEGAL ACTIVITIES	0,832	0,090	9,285	0,000

Source: Authors' own calculation.

According to the outcomes of the direct effects between latent constructs that are displayed in Table 2, the first hypothesis was supported by empirical data. The relationship between the trust crisis in the financial sector and the illegal activities of financial intermediaries (path 16) is significant and is positive *(a = 0,699, T-statistics = 3,492, p < 0,050)*, and thus H_1 was supported.

Futuremore, trust crisis in the financial sector do have a significant influence on financial sector deformations (*a = 0,603, T-statistics = 2,380, p < 0,050*), and the latter on illegal activities of financial intermediaries (*a = 0,832, T-statistics = 9,285, p < 0,050*).

4.3 Mediating model and second hypothesis testing

In contrast to the moderating model (Kowo Solomon Akpoviroro et al., 2018), in this study, the mediating effect model (Suifan, 2019, Sajjad et al., 2020, Wang et al., 2020) was built in order to investigate the mediation role of degradation of financial institutions and markets in the link among trust crisis in the financial sector and illegal activities of financial intermediaries. Since the relationship between the independent latent construct and mediator, as well as a mediator and the dependent latent construct, exists, the mediating analysis could be implemented. Based on the above analysis and estimated standardized regression coefficients, Figure 3 was built in order to provide a graphical interpretation of the direct and mediation effect proposed by the researchers.
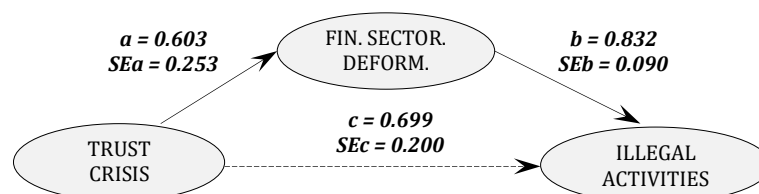

Figure 3. A mediating model with path coefficients
Source: Authors' own calculation.

Sobel test (Sobel 1982 a,b) was used for mediating model analysis and evaluation of significance financial sector deformations as a mediator. The data from Table 3 presented the expressive influence of the financial sector deformation with regards to their depth, access, and efficiency as a mediator between the trust crisis in the financial sector and the illegal activities of financial intermediaries. Consequently, the decision of null hypothesis H2 has not been rejected.

Table 3

Results of mediating model and second hypothesis testing summary

Hypothesis	Mediator	Mediating effect (ab)	SEab	Sobel test (z test)	p-value	Result
H2	FIN.SECTOR.DEFORM.	0,502	0,216	2,322	0,010	Significant

Source: Authors' own calculation.

Consequently, any downward of trust (escalation of trust crisis) in the financial system drastically deteriorated its functioning and actually degrades the financial system (a = 0,603). Meanwhile, the financial system's deformations contribute to the increased risk of financial intermediaries' involvement in shadow transactions (b = 0,832). In general, a rise by one standard deviation in the trust crisis in the financial sector creates the causal chain by virtue of the financial sector deformations leads to the growth of the illegal activities of financial intermediaries of 0,502 standard deviations (mediating effect). The calculated Sobel test (z test) is 2,322, which corresponds to a p-value is equal to 0,010.

As shown in Table 2 and Figure 3, the direct, also referred to as the unmediated effect, is significant and equal to 0,699. This signifies that expansion of the trust crisis in the financial sector by one standard deviation, by virtue of other channels, distinct from whatever financial sector deformations with regards to depth, access, and efficiency transmit, would yield an increase in illegal activities of financial intermediaries indicators of 0,699 standard deviations.

The total mediation effect derived by means of additions of mediated models results is about 1,201. These research findings imply that expansion of the trust crisis in the financial sector by one standard deviation may lead the causal chain by virtue of the financial sector deformations that would yield an increase in the illegal activities of financial intermediaries of 1,201 standard deviations. Consequently, when investigated unmediated effect as an indirect effect model in which the appropriate mediators have yet to be determined or specified, the total effect shows positive mediation of financial sector deformations and other processes (or mechanisms) distinct from them in the link among the trust crisis in the financial sector and involvement of financial intermediaries in shadow transactions.

Since a trust crisis in the financial sector has both direct and indirect effects on financial intermediaries' illegal activities, the study has a deal with partial mediation. However, the direct effect is greater than the indirect effect. Therefore, the financial sector deformation is believed to play the role of a significant but not a vital mediator between the trust crisis in the financial sector and financial intermediaries' involvement in shadow transactions.

4.4. Model fit

In assessing the model fit, several fit indices were used. The goodness-of-fit statistics independently performed by STATISTICA software checks the proposed conceptual model's adequacy based on developed criteria. It should be noted that illustrated in Figure 1 path diagram shows a final conceptual model of structural equation analysis. Beforehand multiple testing and modifications after verification and validation of different hypotheses for the linkages between observed variables and latent (non-observed) constructs were carried out.

Most researchers (Byrne (2009), Ryu (2014), Balakrishnan et al. (2016), Ahmed et al. (2017)) investigating fit measures for the hypothesized models have utilized different categories of fit indices such as absolute, relative, parsimonious fit indexes, and noncentrality based indexes. However, they have not been able to reach an agreement on what kind of indices should be used to determine the adequacy of the goodness of fit. The results of fit measures for measurement and structural models, as well as the recommended values of the goodness of fit indices, have been reported in Table 4.

The results of confirmatory factor analysis (CFA) were checked following a theory for all the determinants and indices displayed in Table 4. The summarized confirmatory factor analysis results of all latent constructs of measurement and structural models have complied with the recommended values for all employed fit indices.

Table 4

Measurement and structural models fit statistics

Fit index	Recommended values	Measurement model	Structural model
χ2	≤ 3	1,456	1,169
p-level	> 0,05	0,001	0,099
CFI	≤ 0,05	0,041	0,029
NFI	≥ 0,9	0,912	0,951
TLI	< 0,5	0,035	0,009
GFI	≥ 0,95	0,959	0,979
RMSEA	≥ 0,95	0,959	0,967
PCFI	≥ 0,75	0,790	0,887
PNFI	≥ 0,75	0,820	0,890

Source: Authors' result.

This study the following fit indices were used: Chi-square statistics (χ2), Chi-Square p-level, CFI (Comparative fit index), NFI (Normed fixed index), TLI (Tucker-Lewis index), GFI (Goodness of fit index), RMSEA (Root mean square error of approximation), PCFI (Parsimony-adjusted fit index), PNFI (Parsimony-adjusted normed fit index). The results of Table 4 illustrated that those fit indices values have complied with recommended threshold values. It can, therefore, be concluded that both measurement and structural models are statistically significant. The output results of the confirmatory factor analysis (CFA) of all six elements of the conceptual model fit enough to empirical data.

5. CONCLUSION

Since the 2007–2009 financial crisis, financial sectors worldwide have been faced with low levels of public trust. Along with the emergence of these threats, substantial deformations have taken place in financial institutions and financial markets in recent years. The access, profitability, depth of the financial sector has been threatened. Meanwhile, the amount and value of transactions that exhibit the characteristics of suspicion or illegal have expanded. Besides, headlines about criminal investigations against top management of financial intermediaries more frequently appeared in the media. These patterns have caused the following aim: to assess the unmediated and mediated impact of the trust crisis in the financial sector on financial intermediaries' illegal activities that enable to expound the logic behind the increasing involvement of financial banking non-banking financial institutions in shadow transactions.

The study's empirical results have shown that a direct relationship exists between a trust crisis in the financial sector and the illegal activities of financial intermediaries. The present study appears to be the first attempt to trace and explain an increase in suspicious transactions subject to AML/CFT monitoring reported by banking and non-banking financial institutions with the help of behavioral distortions. This paper demonstrates that in the Ukrainian context, aggravation of the trust crisis in the financial sector, by virtue of other channels, distinct from the financial sector deformations with regards to depth, access, and efficiency (mediator) transmits, would yield an increase in the number and volume of financial intermediaries' illegal operations.

Secondly, the empirical research findings shed new light on explaining and highlighting a mediating role of financial markets' and institutions' deteriorations regarding their depth, access, and efficiency. Guided by the research results that trust crisis in the financial sector does have a significant influence on financial

sector deformations (the relationship between the independent latent construct and mediator), and the latter on illegal activities of financial intermediaries (the relationship between the mediator and the dependent latent construct), the mediated model was developed and checked. The results argue that deepen trust crisis in the financial sector would foresee the causative chain by means of the financial sector deformations to expand financial intermediaries' illegal activities.

This paper's empirical findings identified both direct and indirect effects of the financial sector's trust crisis on financial intermediaries' illegal activities. It is a testament to the partial mediation. Among the more considerable research findings is that the unmediated effect is greater than the indirect effect. From a practical perspective, the findings revealed that financial sector deformation is believed to play the role of a significant but not a vital mediator between the trust crisis in the financial sector and involvement of financial intermediaries in shadow transactions.

The proposed conceptual model would be a fruitful area for further work towards new mediators' identification. Further experiments, using a broader range of mediators, could shed more light on transmission channels in a link of the trust crisis in the financial sector and financial intermediaries' illegal activities in the Ukrainian context. Considerably more work will need to be done to determine moderators (conditional effects) between the trust crisis in the financial sector and involvement of financial intermediaries in shadow transactions. In this line, both mediating and moderating effects of frauds in the financial industry, innovative financial technologies development, information, and communications networks use could be investigated.

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