Money laundry and financial development

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MONEY LAUNDRY AND FINANCIAL DEVELOPMENT

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Abstract

Le caratteristiche innovative della ricerca che segue hanno lo scopo di analizzare l'impatto che ha il riciclaggio di denaro rispetto alla crescita economica di alcuni stati, nonché, individua come contribuisce lo sviluppo finanziario nella promozione di rimedi al verificarsi di operazioni illecite di riciclaggio provenienti dall'interno o da paesi esteri. Inoltre, la ricerca ha cercato di creare un legame tra questioni teoriche di sviluppo finanziario e riciclaggio di denaro, utilizzando un modello biperiodale. La stima è stata prodotta utilizzando il metodo generale dei momenti (MGM) per i dati panel intercorrenti tra il 1985 e il 2008. Il campione analizzato include sei paesi appartenenti a tre continenti che sono: Italia, Svizzera, India, Cina, Etiopia e Kenya. L'analisi del campione è stato condotta utilizzando il metodo di Phillips-Perron(PP) dei test di radice unitaria, che presenta dei vantaggi rispetto al metodo AugmentedDickeyFuller (ADF). Per verificare il numero di relazioni di cointegrazione tra variabili o per determinare se le combinazioni delle variabili sono cointegrate, lo studio ha utilizzato il metodo di test di cointegrazione di Johansen. Nell'approccio di base si utilizza la variabile "tassazione fiscale" al fine di determinare la quantità di valuta illegale in circolazione nei paesi presi in considerazione. Tuttavia, nell'ambito dello studio è stato utilizzato il livello di sviluppo finanziario come fattore principale per individuare l'incremento o diminuzione della quantità didenaro riciclato in circolazione. Il presupposto della ricerca è quello di individuare il livello di sviluppo finanziario che innesca una domanda di moneta e una circolazione del denaro tale da favorire la presenza e la convenienza a riciclare denaro di provenienza illecita. Il risultato della regressione utilizzata tende ad individuareil livello di sviluppo finanziario che contribuisce ad accrescere significativamente la domanda moneta, che conseguentemente potrebbe essere utilizzata, nel suo complesso, per effettuare transazioni legali e/o illegali. Sostanzialmente la crescita economica di un paese è correlata proporzionalmente alla possibilità che la maggiore circolazione di denaro possa esporre i mercati ad un incremento di transazioni connesse al riciclaggio di denaro, quindi illegali.

JEL:G3, E3, F3.

Parole chiave: riciclaggio e sviluppo finanziario.

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Abstract

This study is the novel in analyzing the relationship between money laundry and financial development and also the contribution of financial development in promoting for the occurrence of illegal transactions originated from domestic or foreignmarket. Moreover, the study tried to create link between the theoretical issues of financial development and money laundry with the empirical result using a two period model. The estimation made using the General Moment Method(GMM) for the panel data from 1985 to 2008.We included six countries in our sample: Italy, Switzerland, India, China,Ethiopia and Kenya.We have used the Phillips-Perron(PP) method of testing unit root because of its advantage over the Augmented Dickey Fuller (ADF). To test the number of cointegrating relationships among variables or to determine whether any combinations of the variables are cointegrated,the study employed the Johansen cointegration testing approach. The basic approach uses tax variable in order to determine the illegal currency in circulation. However, in this study we used the level of financial development as a principal factor for increasing or decreasing currency in circulation. Our assumption is, the level of financial development trigger for the demand of money(circulation of money) and consequently promote the occurrence of money laundry. Our regression result exhibited the level of financial development have a significant contribution for increasing demand for money that could be used for legal and illegal transactions. In countries where well(less) financial development exist, the more(less) exposed environmentfor the occurrence of illegal transactions(i.e. money laundry).

JEL:G3, E3, F3.

Key words:money laundry and financial development.

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1. Introduction

Because of the jeopardy on economic development, fighting against money laundering features very high on the international as well as domestic, political agenda. The speed with which law-makers have put in place a set of legal rules designed to fight the laundering of the income from different activities like drug trafficking and other criminal acts, first from drug traffickingisremarkable. Money laundering has followed three basic steps that launderers follow. Placement, Layering and Integration are the followed in order to generate income from money laundry activities.

The major intentions to undertake or involve in illegal source is just to fulfill unlimited need or materialization. As the theory suggested people or individuals need to consume whatever comes to their mind. So, to achieve this goal they look the possible sources of income regardless the origin of the income. The possible act that able to generate from illicit sources are tax evasion, violation of government regulations and control, bureaucratic practices, political activities, growth of government expenditure, decline in social and moral fabric of the society and lastly, no or extremely low degree risk of being caught, convicted and punished (Agarwal, 1991). One of the nature of money laundry that makes it very complex and long-lived are the involvement of politicians, bankers, lawyers, car dealers, real-estates builders, accountants, workers and others.

Many researcher analyzed the negative effects of money laundry on the economic environment taking in to account different variables[3].Brent L. Bartlett(2002) in his study stated that it is very difficult to quantify the negative effect of money laundry on Economic prosperity. However, money laundry damages financial institutions which are the backbone of the economy,reduces productivity by diverting resources and encouraging crime and corruption, and can also distort the economy's international trade and capital flows to the detriment of long-term economic development. Given the staggering volume of such socio-economic criminal offences, broad international cooperation between law enforcement and regulatory agencies is essential in order to identify the source of illegal proceeds, trace the fund to specific criminal activities and confiscate criminal's financial assets. Money-laundering as a term brings to our mind those nefarious activities of the criminals who provide an envelope to "slush funds" in order to exhibit those as genuine money. In the current economic framework, money-laundering has emerged to be a process by which criminals give the color of legality and legitimacy to slush funds, as against the observed phenomena in the 1900s. Ignoring economic vandalism, most crimes have economic benefits as their backbone. Generally the Economical effects of money laundry can be summarized as follows:

- undermining the legitimate private sector;
- undermine the integrity of financial markets;

[3] Among the studies made are Unger, B., Seigal, M., Ferwerd, J., Kruijg, W. (2006), Bartlett(2002), Quirk (1996), Takats, Elod (2007), Tanzi, V.(1996), Egger, Peter and Hannes Winner, (2006), Hejazi, Walid and Edward Safarian (1999), Abalkin, A. and John Whalley (1999), and Wu, Shih-Ying (2006).

- loss of control of economic policy;
- economicdistortion and instability;
- loss of revenue;
- risks to privatizationefforts;
- reputationalrisks;
- social costs.

In Black's Law of Lexicon the term laundering is being referred to as investment or other transfer of money flowing from racketeering, drug transactions and other sources (illegal sources) into legitimate channels so that its original source cannot be traced. Apart from the traditionally known activities for laundering of money via drugs, racketeering, kidnapping, gambling, procuring women and children, smuggling (alcohol, tobacco, medicines), armed robbery, counterfeiting and bogus invoicing, tax evasion and misappropriation of public funds, the law enforcing agencies are confronted with the creativity of human talent in flowering newer markets for such non-desired socially-ill activities. The newer markets in the last three decades to hold grounds in trade in R&D of highly strategic nature such as nuclear technology, smuggling, illegal labor and refugees, computer piracy, trafficking in works of art and antiquities, information thefts, trade of species and human organs, forgery in arms, capital market scams, toxic and nuclear products and others (Agarwal, 2004).

2. Money Laundry and Financial Development

2.1 Money Laundry and its Determinants

According Financial Action Tasks Force(FATF)[4]definition, money laundering is the processing of criminal proceeds to disguise their illegal origin. Different bodiesor organization define money laundry differently though the basic concept is not different. For example International Monetary Fund(IMF) defines money laundry as "transferring illegally obtained money or investments through an outside party to conceal the true origin". Moreover, the Australian Transaction Reports and Analysis Center(AUSTRAC[5]) as "the process by which illicit source of moneys are introduced into an economy and used for legitimate purposes".

[4] FATF is The Financial Action Task Force (FATF) is an inter-governmental body whose purpose is the development and promotion of national and international policies to combat money laundering and terrorist financing. The FATF is therefore a 'policy-making body' that works to generate the necessary political will to bring about legislative and regulatory reforms in these areas. The FATF has published 40 + 9 Recommendations in order to meet this objective.

[5] AUSTRAC is Australia's anti-money laundering and counter-terrorism financing regulator and specialist financial intelligence unit. AUSTRAC was established under the Financial Transaction Reports Act 1988 (FTR Act) and is continued in existence by theAnti-Money Laundering and Counter-Terrorism Financing Act 2006.

2.1.1 **Money LaundryStages**

Money laundering has three basic steps that launderers follow. These are

I. Placement;
II. Layering;
III. Integration.

During the placement stage, the hard currency generated by the sale of drugs, illegal firearms, prostitution or human trafficking etc. needs to be disposed of, and is deposited in an institution or business. Expensive property or assets may also be bought. During the layering stage, money launderers endeavor to separate illegally obtained assets or funds from their original source. This is achieved by creating layer upon layer of transactions, by moving the illicit funds between accounts, between businesses, and by buying and selling assets on a local and international basis until the original source of the money is virtually untraceable. The more transactional layers are created, the more difficult it becomes for an auditor to trace the original source of illicit funds, and thus anonymity is achieved. Upon successful completion of the financial layering process, illicit funds are reintroduced into the financial system, as payment for services rendered, for example. By this stage, illegally obtained funds closely resemble legally generated wealth. Depending on the money laundering mechanisms available to the launderer, these three steps may overlap. Whether the money laundering process starts with a deposit or a purchase, the methods will invariably entail layers of shape-shifting transactions aimed at distancing the funds or assets from their source origins. The further this transactional distance becomes, the "cleaner" the laundered money appears. In addition to the above definitions on Money Laundry different researcher explained it in detail taking into account different circumstances.AUSTRAC argued that among the three basic steps of money laundry,placement which is the initial stage of money laundering is the physical disposal of bulk cash profits that are a result of an illegal activity. In contrary to AUSTRAC, Schaap (1998) stated that before the placement stage which is the initial according to AUSTRAC, there is exchange phases it is known as phase. Moreover, Schaap stated that upon completion of the prior stages the next step is called integration which is when the money returns to the legal monetary system it is considered as an investment[6]. Further Schaap (1998) continued to the next which arguing that integration is not the final stage. According to Schaap (1998) after integration step which is the final stage based on AUSTRAC, there is fourth step which is known as legitimization.So far a series of international conventions have come in force since the 1980s to strengthen the efforts for combating money laundering and its ill effects. The following are among the conventions made to control money laundry. The most important convention are:

- ✓ the 1988 Convention (against illicit Traffic in Narcotic Drugs and Psychotropic substances);
- ✓ the 1989 G-7 Summit FATF 40 Recommendations;
- ✓ the 1990 Strasbourg Convention (towards the Council of Europe's Convention on Laundering);

[6] According to Schaap at this stage the funds where are fully integrated in the legal system.

- ✓ the 1991 and 2001 European Directives by the EC and EP;
- ✓ the Naples Action Plan (based on the World Ministerial Conference on Organized Transnational Crime);
- ✓ the 1997 OECD Convention on Corruption;
- ✓ the 1998 New York Action Plan (based on UN General Assembly session on Narcotic Drugs and Psychotropic substances);
- ✓ the 1999 French Convention for Suppression of the Financing of Terrorism;
- ✓ the 1999 Money Laundering Bill in India (followed by FERA 1973 and then FEMA 2001) as a result of IIF-FIU study;
- ✓ the 1999 G-7 Financial Stability Forum (to promote international financial stability through exchange of information and international cooperation's);
- ✓ the 2001 USA Patriot Act (to counter money laundering and terrorist movements);
- ✓ the 2004 IMF-World Bank decision to combat Money Laundering (this was greatly influenced by the keynote address on 26th March 2004 delivered by Prof. J. D. Agarwal in Manila to Banker's, which was covered internationally via news agencies and papers.

2.1.2 Determinants and Measuring Money Laundry

2.1.2.1 Determinants of Money Laundry

Different determinants of money laundry used in order to analyze their contribution in flourishing the effects of money laundry on the formal economy by different researchers[7]. However, many argued that the following factors would represent and have a significant contribution for well-off money laundry. The factors are:

- soundness of the banking system;
- development of capital markets;
- size of the underground economy;
- quality of government institutions;
- quality of corporate governance.

[7]Masciandaro (1999, 2002, 2004) used the informal or illegal economy, and institutional quality as basic determinants of money laundry.

2.1.2.2 Measuring Money Laundry

The complexity and variety source of money laundry attributed for the existence of little theoretical and empirical methodology to measure money laundry. Reuter and Truman(2004) applied different methodology using different proxies of money laundry in order to find the real representative of Money laundry.Vuletin(2008),Greenidge (2009),Georgiou(2007),Maurin(2006),Lkhagvajargal (2004),Kauffman &Kaliberda (1996), Frey and Weck-Hanneman (1984), Feige (1979),Cagan(1958) and Fisher have suggested different approaches to measure money laundry. The approaches are summarized as follows:

(i) the discrepancy between income and expenditure measures of GDP reported in national accounts statistics, assuming that expenditures will be reasonably well reported but that elements of income will be concealed or underreported;

(ii) the discrepancy between the official and actual labor force, assuming that a decline in participation in the official market may reflect increasing activity in the underground economy(Shadow economy)[8];

(iii) the discrepancy between official GDP and total nominal GDP (transactions approach), assuming a constant relationship over time between the volume of transactions and official GDP (Fisher's quantity equation);

(iv) the discrepancy between actual or "excess" demand for money and the demand for money that can be explained by conventional or normal factors (currency demand approach), assuming that cash is the primary means of payment used to settle transactions in the underground economy;

(v) the discrepancy between actual and official GDP estimated on the basis of electricity consumption, assuming that economic activity and electricity consumption move together, with an electricity/GDP elasticity close to one.

2.2 Financial Development and its Determinants

2.2.1 Importance of Financial Development

Economic theory indicates that the main role of financial markets and institutions is to minimize the costs of information and transactions. However in contrary to the theoretical issues, Arrow-Debreu state contingent claim framework, there is no need for financial markets and institutions, because there is full information and transactions costs are absent. Hence, resources do not have to be spent to assess risks embedded in projects and behaviors of managers, and there is no need for a mechanism to reduce

[8] Shadow economic activities include employment, production, and exchange unreported to government authorities constitute a large and growing part of all economic activity throughout the world.

transaction costs. When the assumptions of the Arrow-Debreu framework are relaxed and fiction introduced that the role of financial systems becomes very important. In a bid to minimize transaction and information costs, Merton and Bodie (1995) demonstrate that financial markets and institutions emerge to facilitate the allocation of resources across space and time, in an uncertain environment.According to Levine (1997), the basic functional role of financial market and institutions are:

- management of liquidityrisk;
- information acquisition and resource allocation;
- monitoring of investmentprojects;
- mobilization of savings;
- the facilitation of the exchange of goods and services.

These functions influence the economic growth of the country through capital accumulation and technological innovation. The contribution of Capital accumulation is either change the savings rate or reallocates savings among different capital producing technologies. With regards to technological innovation, the financial system affects steady state growth by altering the rate of technological innovation.

2.2.2 Determinants of Financial Development

Research on the role of financial development in growth can be traced back at least to Schumpeter (1912) who points out the role of a country's banking system for economic development. The inherent functions of financial systems, including mobilizing savings to their highest valued use, acquiring information, evaluating and monitoring investment projects, and enabling individuals to diversify away idiosyncratic risk, have been widely believed to encourage productive investment and therefore total factor productivity. Given the broad consensus on the substantial role of financial developmentin economic growth, it is of great practical importance to understand the origins of financial development. Recent years have witnessed burgeoning research in this context. This section briefly outlines the main possible determinants of financial development, including institutional factors, macroeconomic factors, and others, that have been studied in the literature.

A. Institutions

The role of institutions for financial development has discussed as a determinant of several economic variables. Among the role of institutions, a legal and regulatory system involving protection of property rights, contract enforcement and good accounting practice. Regulations concerning information disclosure, accounting standards, permissible practice of banks and deposit insurance do appear to have material

effects on financial development. La Porta et al. (1997,1998) and Beck et al. (2003) have discussed colonization effects on the development of financial system[9].

B. Policy

Country's macroeconomic policy and openness of equity and capital market have a strong link with level of financial development. A macroeconomic policies that keeps inflation lower would create a favorable environment for developing financial system. As Huybens and Smith(1999) analyzed the effects of inflation on financial development and they made a conclusion that higher inflation rates would have a negative impact on efficiency and effectiveness of financial intermediaries.

C. Othervariables

Besides to the above variables, Economic growth, Income, Population, Language, Religious and characteristics are also factor that determine the financial development level. Levine(1997,2003,2005) has discussed how the income factor influence the financial development. Moreover, Greenwood and Jovanovic(1990) and Saint Paul(1992) analyzed the contribution of economic growthin reducing the cost of operation for financial intermediaries and banks and as a result the can accumulate huge fund used it for a productive investment.

2.3 Relationship between Financial development and Money Laundry

There are some studies which analyzed the relationship between money laundry and financial development and financial soundness. Banking institutions and other financial institutions such as insurance companies, securities firms, or financial investment management firms are particularly vulnerable to themoney laundry. Money laundry erodes these important financial institutions and impairs their development. Financial institutions in a developing country play an important role in investment decisions and capital flows. Confidence in them is therefore crucial for developing economies which rely on these decisions for future growth, as well as to attract a stable base of customer deposits to support credit growth for consumers and business, while increasing the potential size of the formal economy.Money laundry activities can also take place through various abuses of informal banking and financing channels and alternative remittance systems. These informal systems generally operate outside of the regulatory system that applies to financial institution. Although these systems serve legitimate purposes, they provide a high level or anonymity and can be abused by money launderers and terrorist organizations to escape the scrutiny of financial regulators and law enforcement agencies. Money laundry activities can occur in any country, but they may have a more significant impact on developing countries with relatively small or fragile financial systems or weak

[9]La Porta et al. (1997,1998) analyzed how colonization determines the national approaches to property rights and financial development. Beck et al. (2003) discussed in his paper how the channel via which colonization influences financial development.

economies that are particularly susceptible to disruption as a result of illicit activities. They damage critical financial sector institutions and they may scare away foreign investors and reduce a country's access to both foreign investments and foreign markets.

3. Theoretical Model of Money Laundry and Financial Development[10]

In order to construct a link between the theoretical back ground of the many laundry and financial development with the empirical result of this study,we have analyzed the argument using intertemporal utility function:

$$U^{i,j} = u(C_1^{i,j}) + \frac{1}{1+\phi} u(C_2^{i,j}) \quad \text{.....(1)}$$

Where $C^{i,j}$ is consumption of *i* household in *j* country.$\phi > 0$ is the discount rate. The higher ϕ, the more impatient an individual is, as less weight is put on period two utility. The term $\frac{1}{1+\phi}$ is often denoted as β, which is the subjective discount factor. Moreover, it satisfies that $0 < \beta < 1$.The current period utility function, $u(C_t^{i,j})$, is assumed to be strictly increasing and strictly concave. The first period consumption depends on two sources of income which denoted by y and x(legal source of income and illegal source of income respectively). Then the total consumption in the first period for a representative household would be represented by:

$$C_1^{i,j} = (y_1^{i,j} + x_1^{i,j}) - z \quad \text{.....2}$$

Since in each country financial institutions starting working effectively to control money laundry, the consumption of the household would be different from the first period in two cases. First, the inclusion of interest income on z plus what remained from last year total income($z = (y_1^{i,j} + x_1^{i,j} - C_1^{i,j})$) not used for consumption that is saving. Second, due to financial development the household incomefrom illegal source of income will be seized or stopped. Then thesecond year consumption would be:

$$C_2^{i,j} = y_2^{i,j} + w^{i.j} - \psi^{i,j} \lambda x_1^{i,j} \quad \text{.....3}$$

where W[11] is financial wealth generated using the residual of the first period income(interest plus z),and $\psi^{i,j}$ represent the probability of controlling illegal transactions by financial institutions which lies between

[10] We have derived and analyzed based on Tito Belchior Silva Moreira work titled " A Two-Period Model of Money Laundering and Organized Crime" *Catholic University of Brasilia(2007).*

[11] W is the financial wealth equals to $(\Phi+1)Z$. Where $\Phi$is the fixed real interest rate.

0 and 1. λ represents the contribution of financial development in tackling money laundry and would have value between 0 and 1.

$$V^{i,j} = \psi^{i,j} \lambda x_1^{i,j} \quad \text{.....4}$$

Where V denotes the value retained from illegal transactions as a result of effective and well developed financial system. In country where financial institutions work effectively and efficiently, the number of illegal transactions that originated from domestic and foreign country and may reach zero and then the value of ψ and λ approach to one. Then thenewconsumption function for the second period will become[12]:

$$C_2^{i,j} = y_2^{i,j} + w^{i.j} \quad \text{.....5}$$

Having taking into the above discussion about the possible value of ψ and λ in case of effective and efficient financial system, we can have the following relation between them:

$$\psi^i = \lambda \quad \text{.....6}$$

In this study we will not consider equation(5) for our further analysis of the contribution of financial development on illegal transactions.As a result of equation(6) the second year consumption function for the representative household would become:

$$C_2^{i,j} = y_2^{i,j} + w^{i.j} - \lambda^2 x_1^{i,j} \quad \text{.....7}$$

If we combine the first year and second year consumption we get the budget constraint which is the total consumption equals to the total income of the household for the total period. Therefore, it would become:

$$C_1^{i,j} + C_2^{i,j} = y_1^{i,j} + \lambda^2 x_1^{i,j} - z + y_2^{i,j} + w^{i.j} \quad \text{.....8}$$

Then after some arrangements ,the final budget constraint can be written as follows:

$$C_2^{i,j} = y_2^{i,j} - \lambda^2 (C_1 - y_1^{i,j}) - z(\lambda^2 - \Phi - 1) \quad \text{.....9}$$

Finally we can conclude that the illegal source of income source of income is a function of the legal income, saving and the development of financial system. Having considering these variable it can be written as follows:

$$x_1^{i,j} = f(y_1^{i,j}, y_2^{i,j}, \psi^{i,j}, \lambda\ , z^{i.j}, \Phi) \quad \text{.....10}$$

[12] Since ψ and λ will become one the value of illegal income would be zero. Moreover, they are strongly correlated.

In order to make some conclusiononthe relation between financial development and money laundry we need to maximize the utility function of the representative household subject to the budget constraint. Thus, the utility maximizationproblem can be rewrittenas:

$$\max_{c_1} u(C_1^{i,j}) + \beta\left[y_2^{i,j} - \lambda^2(C_1^{i,j} - y_1^{i,j}) - z(\lambda^2 - \Phi - 1)\right] \quad \text{.....11}$$

The corresponding first order condition is:

$$u'(C_1) = \lambda^2 \beta u'(C_2^{i,j}) \quad \text{.....12}$$

Equation(12) is often referred to as Euler equation, which has the following intuition that is at a maximum the consumer cannot gain from feasible shifts of consumption between periods.Equation(12) can be further rearranged as follows:

$$\beta \frac{u'(C_2^{i,j})}{u'(C_1^{i,j}).} = \frac{1}{\lambda^2} \quad \text{.....13}$$

4. Data Description and Methodology

The data that we used for estimation of the parameters covers from 1985 to 2008.The data obtained from IMF,WB and from each country statistical office. WeusedGMM estimation method which was formalized by Hansen (1982), and since has become one of the most widely used methods of estimation for models in economics and finance. Among the advantageous of using GMM are, GMM does not require complete knowledge of the distribution of the data and only specified moments derived from an underlying model are needed for GMM estimation. In models for which there are more moment conditions than model parameters, GMM estimation provides a straightforward way to test the specification of the proposed model. Because these unique feature of GMM we have used it to estimate the parameters of the determinants of money laundry. GMM makes use of the orthogonality conditions to allow for efficient estimation in the presence of heteroskedasticity of unknown form. Therefore our model would have the following structure:

$$ML_{k,j,t} = \beta_1 + \beta_2 FD_{k,j,t} + \beta_3 UE_{k,j,t} + \beta_4 QG_{k,j,t} + \varepsilon_{k,j,t} \quad \text{.....14}$$

Where money laundry is assumed the money laundered and peroxide by $\frac{M2}{GDP}$,FD is a financial development and represented by ratio of Insurance and Financial Service (INFS) to export and Domestic

Credit to Private Sectors(DCPS) to GDP, UE is underground economy and represented by Lending Interest Rate(LIR) and Consumer Price Index(CPI), QG is Quality of Government and peroxide by School Enrollment Percentage.

4.1 Properties of Data

We have done stationary test before the regression and description analysis in order to augment the credibility of our output and conclusion on money laundry and financial development. We have used the Phillips-Perron method of testing unit root because of its advantage over the Augmented Dickey Fuller (ADF). One advantage of the PP tests over the ADF tests is that the PP tests are robust to general forms of heteroskedasticity in the error term u_t. Another advantage is that the user does not have to specify a lag length for the test regression. The Phillips-Perron (PP) unit root tests differ from the ADF tests mainly in how they deal with serial correlation and hetroskedaticity in the errors. In particular, where the ADF tests use a parametric auto-regression to approximate the ARMA structure of the errors in the test regression, the PP tests ignore any serial correlation in the test regression. The test regression for the PP tests is:

$$\Delta y_t = \beta' D_t + \pi y_{t-1} + u_t \quad \text{.....15}$$

where$D_t$is deterministic trend and u_t is I(0) and may be heteroskedasticity. The PP tests correct for any serial correlation and heteroskedasticity in the errors u_t of the test regression by directly modifying the test statistics t_π=0 and T hut π. These modified statistics, denoted Z_t and Z_π, are given by:

$$Z_t = \left(\frac{\hat{\sigma}^2}{\hat{\lambda}^2}\right).t_\pi = 0 - \frac{1}{2}\left(\frac{\hat{\lambda}^2 - \hat{\sigma}^2}{\hat{\lambda}^2}\right).\left(\frac{T.SE(\hat{\pi})}{\hat{\sigma}^2}\right) \quad \text{.....16}$$

$$Z_\pi = T\hat{\pi} - \frac{1}{2}\frac{T^{2.}SE(\hat{\pi})}{\hat{\sigma}^2}(\hat{\lambda}^2 - \hat{\sigma}^2) \quad \text{.....17}$$

The term $\hat{\lambda}^2$ and $\hat{\sigma}^2$ are consistent estimate of the variance parameters

$$\sigma^2 = \lim_{T\to\infty} T^{-1}\sum_{t=1}^{T} E[u_t^2] \quad \text{.....18}$$

$$\lambda^2 = \lim_{T\to\infty} \sum_{t=1}^{T} E[T^{-1}S_T^2] \quad \text{.....19}$$

Where $S_T = \sum_{t=1}^{T} u_t$ .Under the null hypothesis that π = 0, the PP Z_t and Z_π statistics have the same asymptotic distributions as the ADF t-statistic and normalized bias statistics.

Below in the table the result revealed that all variables in level are not stationary except INFS for ET^KE at critical values of 5%[13]. Taking the first difference of the variables we have obtained stationary. However, the consumer price index(CPI) in case of India and China has a unit root which means not stationary. Regardless the existence of a unit root for consumer price index, we can conclude that the time series data have shown a homogeneity that support to proceed to the cointegration analysis in order to evaluate their long-run relationship.

Variables	Level						First difference					
	T-statistics			Prob.			T-statistics			Prob.		
	IT^SW	IND^CH	ET^KE	IT^SW	IND^CH	ET^KE	IT^SW	IND^CH	ET^KE	IT^SW	IND^CH	ET^KE
M	-1.07	0.67	-1.26	0.72	0.98	0.63	-4.19	-2.35	-4.70	0.00	0.16	0.00
CPI	-1.30	0.19	5.06	0.62	0.97	1.00	-2.51	-2.18	-3.02	0.12	0.22	0.04
DCPS	0.18	0.50	-2.25	0.97	0.98	0.20	-9.50	-3.78	-5.90	0.00	0.00	0.00
INFS	-1.89	-2.45	-3.92	0.33	0.14	0.01	-5.89	-7.80	-11.00	0.00	0.00	0.00
LIR	-0.26	-0.79	-1.36	0.92	0.81	0.59	-3.70	-4.29	-3.54	0.01	0.00	0.02
SER	-0.41	0.66	-0.88	0.89	0.99	0.78	-3.77	-4.22	-4.76	0.01	0.00	0.00

Table 1: Level and First difference result of Unit root test from PP.

4.2 Cointegration Test

The Johansen approach provides tests of hypotheses about the number of cointegrating relationships among variables or to determine whether any combinations of the variables are cointegratedusing two test statistics for each hypothesis. They are trace statistic and maximum Eigen-value statistic. Both statistics frequently lead to the same conclusion. If none of the three hypotheses are rejected, we must worry that the regression is spurious. If we reject the first hypothesis only, we proceed assuming that there is only one cointegrating relationship. If we reject the first and second hypotheses, we proceed assuming that there are two or more cointegrating relationships. If we reject all three hypotheses, we conclude that none of the variables contain stochastic trends after all, because that is the only way there could be as many cointegrating relationships as variables.In the case of maximum Eigen-value cointegration test, the null hypothesis is the number of cointegrating vectors (r) against the alternative of r+1.For trace statistic, the null hypothesis is the number of cointegrating vectors is less than equal to cointegrating vectors (r) against an unspecified alternative.

[13]Critical values for the test using MacKinnon-Haug-Michelis (1999)p values.

Table 2: Result of Cointegration test from Johansen Approach.

Countries	Hypothesis		Max-EigenStatistics	Critical Values at5%	Prob.	Trace Statistics	Critical valueat 5%	Prob.
	H_o	H_a						
M,CPI,DCPS,INFS,LIR and SER								
IT^SW	r =0	r =1	61.62	40.08*	0.00	170.74	95.75*	0.00
	r ≤1	r =2	44.64	33.88*	0.00	109.11	69.82*	0.00
	r ≤2	r =3	25.89	27.58	0.08	64.48	47.86*	0.00
	r ≤3	r =4	23.03	21.13*	0.03	38.59	29.80*	0.00
	r ≤4	r =5	10.75	14.26	0.17	15.56	15.49*	0.05
	r ≤5	r =6	4.81	3.84*	0.03	4.81	3.84*	0.03
M,CPI,DCPS,INFS,LIR and SER								
IND^CH	r =0	r =1	85.50	40.08*	0.00	175.18	95.75*	0.00
	r ≤1	r =2	41.15	33.88*	0.01	89.68	69.82*	0.00
	r ≤2	r =3	24.45	27.58	0.12	48.53	47.86*	0.04
	r ≤3	r =4	13.50	21.13	0.41	24.08	29.80	0.20
	r ≤4	r =5	10.52	14.26	0.18	10.58	15.49	0.24
	r ≤5	r =6	0.06	3.84	0.81	0.06	3.84	0.81
M,CPI,DCPS,INFS,LIR and SER								
ET^KE	r =0	r =1	67.34	40.08*	0.00	148.25	95.75*	0.00
	r ≤1	r =2	32.07	33.88	0.08	80.91	69.82*	0.01
	r ≤2	r =3	23.50	27.58	0.15	48.85	47.86*	0.04
	r ≤3	r =4	13.83	21.13	0.38	25.34	29.80	0.15
	r ≤4	r =5	10.23	14.26	0.20	11.52	15.49	0.18
	r ≤5	r =6	1.29	3.84	0.26	1.29	3.84	0.26
Money in circulation and Financial development								
IT ^SW	r =0	r =1	10.85	21.13	0.66	15.60	29.80	0.74
	r ≤1	r =2	4.18	14.26	0.84	4.85	15.50	0.83
	r ≤2	r =3	0.57	3.84	0.45	0.57	3.84	0.45
Money in circulation and Financial development								
IND^CH	r =0	r =1	24.22	21.13*	0.012	38.61	29.80*	0.003
	r ≤1	r =2	14.28	14.26*	0.049	14.39***[14]	15.50	0.072
	r ≤2	r =3	0.11	3.84	0.735	0.11	3.84	0.735
Money in circulation and Financial development								
ET^KE	r =0	r =1	17.90	21.13	0.13	25.42	29.80	0.15
	r ≤1	r =2	5.16	14.26	0.72	7.53	15.50	0.52
	r ≤2	r =3	2.37	3.84	0.12	2.37	3.84	0.12

Note that the * indicates the rejection of the null hypothesis or the existence of cointegration.

The above table shows that the Johansen cointegration test results where both trace and maximum Eigen-value statistics find that at least one cointegrating vector exists among the variables. The trace statistics for Italy and Switzerland showed that the null hypothesesrejected in all cases. Therefore, we can conclude that there is co-integrating vector among the variables, where both tests rejects the null hypothesis that said no cointegration with one cointegrated vector for all countries.

[14] *** Represents the existence cointegration at 10% critical value.

4.3 GrangerCausality Test

In this section we have done testing Causality between two variables using the Pairwise Granger Causality Tests (or "G-causality") which was developed by Clive W.J. Granger in 1969.The Granger causality tests determine the predictive content of one variable beyond that intrinsic in the explanatory variable. Moreover, the variables that used Causality test are assumed to be stationary. Though one variable that is consumer price index(CPI) for India and China has a unit root, taking into the cointegration result we included in the causality test.The proxy of currency in circulation in all sampled countries exhibited a casual relationship with domestic credit to private sector which is the proxy of financial development. The result also in line with theoretical issues that argued,as the price of goods and services and the expected price goes up the demand for money will increase.As a result people would start engaging in informal and illegal activities in order to generate cash. Moreover, the causality result also support the robustness of the regression result obtained in the estimation section.

Table 3: Result of Granger Causality Test.

Country	Null –Hypothesis	F-Statistics	Prob.	Results
ET^KE	INFS→CPI	4.80	0.02	Reject the Nullhypothesis
	M→CPI	4.09	0.03	Reject the Nullhypothesis
	CPI→SER	15.47	0.00	Reject the Nullhypothesis
	DCPS→M	3.67	0.05	Reject the Nullhypothesis
	SER↔LIR	3.31^5.81	0.06^0.01	Reject the Nullhypothesis
	M→SER	4.34	0.03	Reject the Nullhypothesis
IT^SW	CPI→INFS	4.43	0.03	Reject the Nullhypothesis
	LIR↔CPI	3.74^6.22	0.04^0.01	Reject the Nullhypothesis
	SER↔CPI	2.42^6.35	0.12^0.01	Reject the Nullhypothesis
	LIR→DCPS	2.69	0.09	Reject the Nullhypothesis
	M↔DCPS	5.58^24.30	0.01^0.00	Reject the Nullhypothesis
	SER→INFS	3.78	0.04	Reject the Nullhypothesis
	SER→LIR	6.54	0.01	Reject the Nullhypothesis
	SER→M	2.66	0.09	Reject the Nullhypothesis
IND^CH	DCPS↔CPI	3.74^7.85	0.05^0.00	Reject the Nullhypothesis
	CPI→INFS	3.02	0.08	Reject the Nullhypothesis
	CPI→LIR	7.03	0.01	Reject the Nullhypothesis
	M↔CPI	2.67^10.14	0.09^0.00	Reject the Nullhypothesis
	DCPS→LIR	3.52	0.05	Reject the Nullhypothesis
	M↔DCPS	10.41^5.99	0.00^0.01	Reject the Nullhypothesis
	DCPS→SER	3.03	0.07	Reject the Nullhypothesis
	INFS→LIR	3.95	0.04	Reject the Nullhypothesis
	M→INFS	4.81	0.02	Reject the Nullhypothesis
	M→LIR	3.63	0.05	Reject the Nullhypothesis
	M→SER	3.15	0.07	Reject the Nullhypothesis

4.4 Descriptive Analysis

Table 4: Mean, Max.,Min. and standard deviation.

Variables		Mean	Max.	Min.	Std.Dev.
M	IT^SW	109.54	129.73	86.70	8.79
	IND^CH	74.69	104.90	42.04	21.66
	ET^KE	32.00	39.84	22.36	5.43
CPI	IT^SW	84.39	105.85	58.30	14.70
	IND^CH	70.67	117.23	26.61	28.63
	ET^KE	64.71	174.35	21.51	37.78
DCPS	IT^SW	111.71	137.36	83.97	13.13
	IND^CH	63.43	79.61	45.82	10.78
	ET^KE	22.52	26.91	17.68	2.13
INFS	IT^SW	17.87	20.88	14.10	2.12
	IND^CH	3.20	6.32	1.42	1.33
	ET^KE	0.97	2.25	0.26	0.51
LIR	IT^SW	7.76	12.16	4.22	2.77
	IND^CH	11.11	13.92	8.17	2.12
	ET^KE	14.67	25.29	9.77	4.96
SER	IT^SW	92.36	98.31	84.41	4.41
	IND^CH	97.69	116.89	88.01	8.59
	ET^KE	75.99	107.67	59.46	13.83

4.5 Regression Analysis Based on Regional Data

The regression result of Ethiopia , Kenya, India and China supported that the existence of strong financial system would contribute to the occurrenceofillegal transactions that would have a contribute to generate illegal cash. In India and China the control variables have also strong contribution for the occurrence of illegal transactions. However, in country where there is strong financial system(i.e. Italy and Switzerland) revealed quit different result from what we have obtained from the other four countries.

Variables	ETH ^KEN	ITA^SW	IND^CH
C	4.53	87.04	-11.38
	(15.56)	(73.87)	(6.18)
	[0.29]	[1.18]	[-1.84]
SER	0.07	0.44	0.05
	(0.14)	(0.99)	(0.05)
	[0.54]	[0.44]	[1.12]
LIR	0.20	-1.05	-1.15
	(0.26)	(0.61)	(0.23)
	[0.76]	[-1.73]	[-4.91]
INFS	2.24	-2.35	0.68
	(0.97)	(2.38)	(0.23)
	[2.32]	[-0.99]	[2.96]
DCPS	0.55	0.04	1.14
	(0.29)	(0.20)	(0.05)
	[1.89]	[0.19]	[21.59]
CPI	0.07	0.33	0.27
	(0.07)	(0.48)	(0.01)
	[1.02]	[0.70]	[19.39]
R-squared	***0.71***	***0.461***	***0.997***

Table 5: Regression Result from average data of two countries.

4.6 Regression Analysis Based on Aggregate Data

The result obtained from regression result using the aggregated data for six countries that covers from 1985-2008 revealed that the control variables have strong effect on the dependent variable except SER. Whereas the proxies of Financial development showed insignificant contribution on dependent variable in aggregate data.

Variable	Coefficients	Std. Dev.	t-statistics	Prob.
C	51.81	15.55	3.33	0.00
SER	-0.17	0.28	-0.60	0.56
LIR	-0.86	0.29	-2.92	0.01
INFS	1.09	0.83	1.32	0.20
DCPS	0.19	0.21	0.93	0.36
CPI	0.33	0.05	6.47	0.00

Table 6: Regression output from Aggregate data.

Conclusion

The key assumption of our model is, currency in circulation(i.e. demand for money) strongly correlated with the occurrence of illegal monetary transactions since money demanded for illegal transactions is the components of the overall currency in the economy. Unlike the usual approachthat consider tax variable as a principal factor to determine the quantity of money used in illegal transactions(i.e. in the shadow economy), we did not consider in our model[15].The model mainly consider the Financial Development variable and analyzed its contribution in reducing or increasing the level of money laundry. The study hypothesized that, if the money in circulation increasedwith the level of financial development,the occurrence illegal transaction originated in domestic and international market will be high.

The overall cointegration result evidenced the existence of long-runcointegration.However,thecointegration test between the proxy of money laundry and financial development exhibited different result depend the level of financial development. For countries which have well developed financial and countries with underdeveloped financial system revealed no cointegration between the two variables(i.e. proxy of money laundry and Financial development. In a country India and China the cointegration result in trace and maximum Eigen statistics showed the existence of cointegration or short term relation between the dependent and the main explanatory variable. Therefore, the result trigger to conclude that, money laundry and financial development in aemergingeconomyhave than well developed or underdeveloped economy. Moreover, the causality result bear the cointegration test result only for underdeveloped financial system. In case of India, China, Italy and Switzerland, there is a strong causality relation between the proxies of money laundry and Financial development.

The regression result exhibited that financial development have a significant contribution for increasing demand for money that could be used for legal and illegal transactions. This implies that, the occurrence of illegal transaction correlate with the level of financial development. For robustness test, we have made regression on aggregate data(i.e. on average data of six countries).The result showed that, the control variables have positive and significant contribution for proxy of money laundry than the main explanatory variable of the study which is financial development. Finally, the R-squared of the regression result is consistent with cointegration test output. The value of R-squared is 71%,46% and 99.7% for ET^KEN,ITA^SW and IND^CH respectively.

[15]SeeCagan(1958).

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Appendix

India and China				
Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	-11.38	6.18	-1.84	0.08
CPIAS	0.27	0.01	19.39	0.00
DCPSAS	1.14	0.05	21.59	0.00
INSFSAS	0.68	0.23	2.96	0.01
INTAS	-1.15	0.23	-4.91	0.00
SEPAS	0.05	0.05	1.12	0.28
R-squared	0.997	Meandependentvar		74.68754
Adjusted R-squared	0.995892	S.D. dependentvar		21.66401
S.E. of regression	1.38845	Sum squaredresid		34.7003
Durbin-Watson stat	1.915998	J-statistic		4.63E-25

Table 7: Regression result for India and China (Asia).

Italy and Switzerland				
Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	87.04	73.87	1.18	0.25
CPIEU	0.33	0.48	0.70	0.50
DCPSEU	0.04	0.20	0.19	0.85
INSFSEU	-2.35	2.38	-0.99	0.34
INTEU	-1.05	0.61	-1.73	0.10
SESEU	0.44	0.99	0.44	0.67
R-squared	0.461	Meandependentvar		109.54
Adjusted R-squared	0.311827	S.D. dependentvar		8.791909
S.E. of regression	7.293431	Sum squaredresid		957.4944
Durbin-Watson stat	0.963932	J-statistic		7.37E-24

Table 8: Regression result for Italy and Switzerland (Europe).

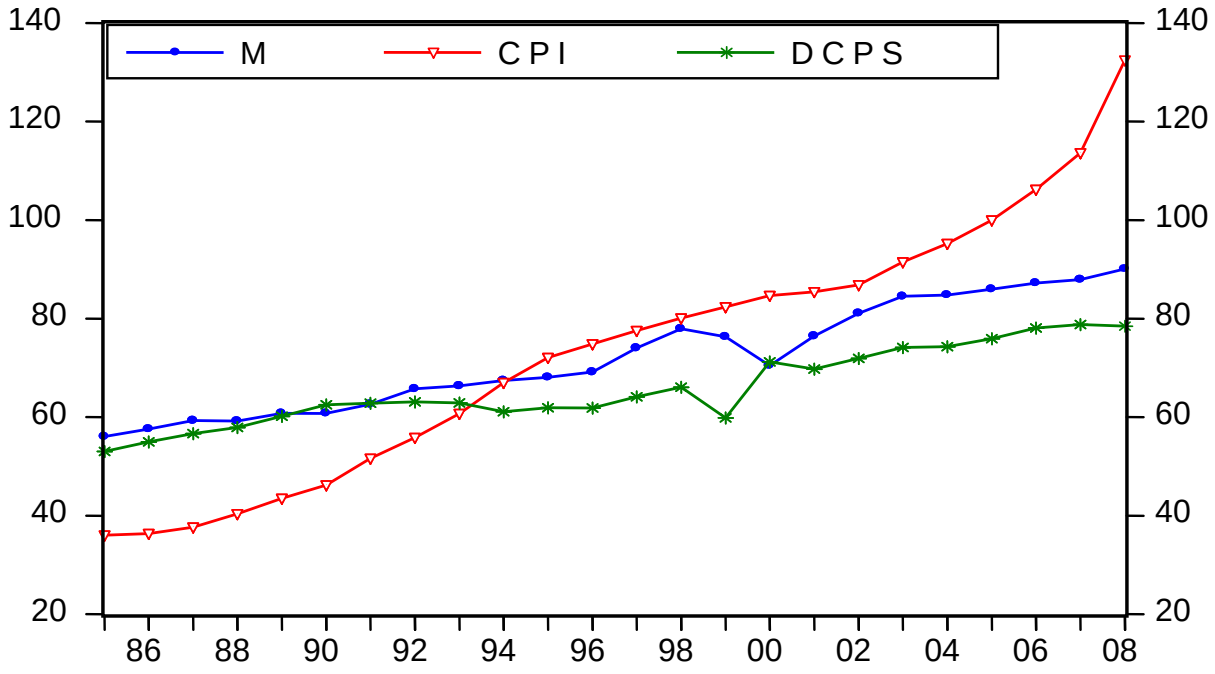
Ethiopia and Kenya				
Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	4.53	15.56	0.29	0.77
CPIAF	0.07	0.07	1.02	0.32
DCPSAF	0.55	0.29	1.89	0.07

INSFSAF	2.24	0.97	2.32	0.03
INTAF	0.20	0.26	0.76	0.46
SEPAF	0.07	0.14	0.54	0.60
R-squared	0.71	Meandependentvar		32.00
Adjusted R-squared	0.63	S.D. dependentvar		5.43
S.E. of regression	3.31	Sum squaredresid		197.09
Durbin-Watson stat	0.51	J-statistic		0.00

Table 9: Regression result for Ethiopia and Kenya (Africa).

Regression result on Aggregate data				
Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	51.81	15.55	3.33	0.00
CPIALL	0.33	0.05	6.47	0.00
DCPSALL	0.19	0.21	0.93	0.36
INSFSALL	1.09	0.83	1.32	0.20
INTALL	-0.86	0.29	-2.92	0.01
SEPALL	-0.17	0.28	-0.60	0.56
R-squared	0.96	Meandependentvar		72.08
Adjusted R-squared	0.94	S.D. dependentvar		10.90
S.E. of regression	2.57	Sum squaredresid		119.27
Durbin-Watson stat	1.31	J-statistic		0.00

Table10: Regression result on aggregate data (all six countries).



Graph 1:Proxy of currency in circulation, informal economy and financial development.