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1 Introduction

There are only a few researches about the relation between the currency in circulation and predominance of corruption. Plenty of studies evolve around economic determinants of corruption, including GDP per capita as a measurement of economic development, government size, openness to trade, press freedom, educational level and even inflation. For such reason, it is of great interest to investigate whether the pervasiveness of different types of payment instruments also affects the predominance of corruption.

The purpose of this thesis is to collect and summarize most relevant literature about the influence of methods of payment on the level of corruption. Such task requires covering sources and causes of corruption, the ways it is measured as well as finding empirical proofs and publications that acknowledged this causality. It is evident that there have been investigations in both advanced and developing nations and some interesting policies have been proposed.

One of the advantages of cash being used for illegal transactions is its anonymity, avoiding the banking channel, in which the economic transactions leave traces (see Sands, 2016). That way it is easier to hide the gains from illicit activities, successfully avoiding revelation and penalties. Therefore in countries where the cash transactions are more common, the bribe payments between corrupt officials and bribers may be a bigger problem. Facts like this indicate that there is a link between a method of payment and corruption.

Also, in the low-income countries with a broader black market the currency transactions are more preferred, studies suggest. Corruption is enhanced in the areas with capital restrictions, due to avoiding limitations on the flow of foreign capital in and out of the domestic economy by bribing the international partners (see Dreher, Siemers, 2009).

Transactions in cash create black money, support petty corruption and are used to avoid taxes. Additionally, large bank notes help reduce the transaction costs of corruption as the cash itself is also sometimes hard to move and store in larger sums (see Sands, 2016). Naturally, it is possible to perform bribing activities alternatively with gold in a case of restrictions of high denomination bills. However, the alternative sources of illegal activities, such as Bitcoin, diamonds or gold increase both the cost and risk of getting

caught. Gold is larger, weighty, more detectable, rarely used and accepted and all these attributes come with a big price (see Sands, 2016). The intuition is that the reduction or elimination of high denomination notes would reduce corrupt behavior due to the mentioned disadvantages of substitutes.

Following this reasoning, there could exist a connection between different ways of payment and level of corruption in the country. In the institutional context, the value of cash reserves not only helps to enhance liquidity and therefore the performance of firms, but those reserves and their effect on performance may be dependent on the level of corruption (see La Rocca, Cambrea, Cariola, 2017).

Furthermore, my interest in this topic comes from the fact that the non-cash ways of payments are being more used comparing to the old fashion cash due to digitalization of the monetary world and technological progress. The feasible implications would be moving more toward electronic ways of payments that could possibly reduce bribing and exploitation.

The following are the research questions I addressed as related issues in the process of investigating the relationship between paper money and level of corruption.

- How much is the level of corruption affected by the currency in circulation?
- Could the cash circulation and high denomination notes be significant determinants of corruption?
- Is the expansion of non-cash transactions a way to reduce and/or fight corruption?
- Could cash reserves and their effect on performance be dependent on the level of corruption?

In order to have empirical proofs on which certain conclusion can be made, the following hypothesis were tested.

- Is the ratio of currency in circulation to money (M1) a statistically significant variable of corruption? (Singh, Bhattacharya, 2017)
- Is the total value of high denomination bank notes relative to M1 a significant cross-country determinant of corruption? (Singh, Bhattacharya, 2017)
- Corruption will be more prevalent in economies where there is a greater use of paper transactions (Goel, Mehrotra, 2012).

2 About sources, causes and indices of corruption

In this section I summarize the literature on the various sources and causes of corruption, focusing on the importance of understanding where all types of corruption come from in order to tackle them the right way. I also present different measurements of corruption that are being used among economists, while turning to the critiques of the Corruption Perception Index as it is probably the most widespread measure of corruption.

2.1. On the sources and causes of corruption

According to Black's Law Dictionary, corruption is defined as „a vicious and fraudulent act of an official person who wrongfully uses his station to procure some benefit for himself or for another person, contrary to duty and the rights of others“ (Black's Law Dictionary, 2014). Corruption is bad for welfare as it is strongly negatively associated with the share of private investment which causes the reduction of the economic growth rate (see Mo, P.H., 2001). The same source suggests that corrupted behavior affects job opportunities, creates the opportunity for increased inequality and generates psychological frustration to the underprivileged.

In the report of 2017 survey study on existing literature on causes and effects of corruption (see Dimant, Tosato, 2017) some of the factors that have been attributed as causes of corruption include low level of democracy, poverty, large ethnic divisions, low political transparency, low levels of education, low internet access, large government size, political instability and inequality. The authors found in a research that it is not only that income inequality increases corruption but there is a different direction of causality as well, proven in an empirical research done by Gupta (2002).

In a Worldbank's blog (2014), Augusto Lopez-Claros talks about the sources of corruption as well. He agrees with many economists that the main source of corruption is considered to be the excessive bureaucracy of the country. The intuition is that the larger countries have a larger number of transactions between government and public so there are more chances for corruption. (see Lopez-Claros, 2014). While this is true for many large countries, there are proofs of the opposite in Nordic ones. Nevertheless, what makes corruption's scale larger are the cases where people take advantage of the

opportunities to avoid responsibilities or some costs by bribing workers both in public and private sector.

The excessive bureaucracy in every aspect of transactions among citizens and government office creates more opportunities for abusing power, from obtaining a birth certificate to paying taxes or registering property. Launching and running small businesses is a challenge in these situations as the scale of issuing licenses and permits gets bigger with more adherence to rules and formalities (see Doing Business report, World Bank, 2014). In some very corrupted countries, the firms simply have no other choice but to pay bribes if they want to run a successful business along with other competitors. Corruption is strongly correlated with bureaucracy, as the larger extent of red tape increases illegal activities in a country (see Lopez-Claros, 2014).

Another cause of corruption lays in unclear tax laws which the tax inspectors and auditors can interpret in different ways and abuse their position. Such conditions create chances for corrupt behavior as well. (see Lopez-Claros, 2014). It is arguable that paying bribes to officials can be understood as a way to speed up the process and improve efficiency as the administrators get an incentive to facilitate transactions and work faster. But exactly because of these 'boosting fees' opportunities, the bureaucrats have incentives to stay corrupt and simply be lazy at work, which at the end hardly enhances efficiency (see Myrdal, 1968). Having this in mind, I argue that in less corrupted countries where the bribing payments do not come often that easily, the officials have no other choice but to do their job as everyone else.

Regardless of which source of corruption takes place in the particular corrupted transaction, that being complicated tax laws or excessive bureaucracy due to heavy number of issuing licenses and permits, they all include large portion of bribing payments in cash as it is anonymous, widely acceptable and makes no official record of transaction (see Sands, 2016). While it is important to tackle all the causes of corruption individually as well, the corrupted institutions, government as well as the private sector are all heavily affected by cash as a payment instrument.

Sands' article (2016) also distinguished three types of corruption. It is intuitive that low level of corruption might be highly correlated with cash. On the other hand, the high level corruption, such as financial or government corruption, is more sophisticated. Indeed, in the petty corruption, which involves paying bribes to administrators to get favors or jump ahead at certain positions, cash plays a dominant role. However, the grand and systemic

corruption is about abuse of the legal system and subverting the institutional processes that occur at a high level of government in which evidences have been found that the high denomination notes are being used for illegal transactions (see Sands, 2016). This means cash plays a significant role in all levels of corruption.

Yet, I argue that it is empirically not possible to measure the impact of cash on various levels of corruption, due to the fact that the corruption indices represent the perception of corruption in a general way.

Regarding the various anti-corruption laws among countries and their possible influence on how illegal activities are performed by using currency, I used the comparison in six jurisdictions, including United States, United Kingdom, Canada, France, Germany, and Russia (see Dentons, 2013). They mostly differ in the broadness of offenses and legislative coverage. The United Kingdom went further and introduced additional offense for not preventing bribes, while the United States has high profile enforcement actions compared to others (see Dentons, 2013). Considering this, I argue that there is no highly significant impact of anti-corruption laws on a connection between payment method and corruption.

2.2. On the corruption indices

To measure to which extent the bribing activities spread in a country, three main indices of corruption were identified, including World Bank's Control of corruption index, International Country Risk Guide index and the Corruption Perception index. Control of corruption index measures the extent to which public power is exercised for private gain, including both petty and grand forms of corruption, as well as „capture" of the state by elites and private interests (see The Millenium Challenge Corporation). It also measures the strength and effectiveness of a country's policy and institutional framework to prevent and combat corruption. The range of the index goes from -2,5 to +2,5, with higher index meaning a lower level of corruption (see Kaufmann; Kraay; Mastruzzi, 2011).

International Country Risk Guide is a product of PRS group and this index includes political, financial and economic risk analysis (see The PRS group). The Corruption Perceptions Index (CPI), published by Transparency International ranks countries by their perceived levels of corruption, as determined by expert assessments and opinion surveys (Transparency International, 2011). The measurement of corruption by this index is done by the likelihood of high government officials demanding special payments, as

well as bribing police, lenders, the import and export license issuers. It has a range of 0 to 10, with also higher value representing less corruption (see Transparency International, 2011).

Considering the popularity of CPI, The Washington Post's article about its flaws was analysed. Its first major flaw is the corruption being more complex and this complexity is just not possible to mark with a single score (see Hough, 2016). For example, the extent, scope and type corruption can vary significantly in the different parts of the country which makes it difficult to cover everything by one score. The accent here is on the specific places where most injustice and corrupt behaviour happens and not necessarily on the national level, meaning corruption often happens across borders with trans-national networks. (see Hough, 2016). What makes it more difficult is that the concepts that are measured such as equality, integrity, and democracy are always approximated and CPI currently does not contribute to making them more accurate.

Also, a perception of corruption, which is actually measured by CPI, can differ from the real facts and therefore it is debatable how these judgements can be useful in measuring the scope of corruption in a country. The CPI is focused only on public sector corruption, neglecting the private business states and conditions which can be surrounded by corruption scandals, even in highly developed nations. These and even non-profit sector should be taken into consideration as well (see Hough, 2016).

What makes measuring corruption more difficult is the fact that these illegal activities happen secretly with agents hiding while performing transactions. (The Guardian, 2013). If corruptive transactions are very well hidden in a certain country then the score the index gives just is not valid and does not even give the approximate picture of a corruption.

Among the critiques regarding CPI index is also the bias in usual perceptions of corruption conducted by a small group of people as well as a perception of corruption not being the popular choice but rather try to conduct these surveys in such way that the best evidence for real corruption is collected (see Heywood, 2016). Additionally, there is a strong consistency of index among years since it was launched until now which questions the relevance of the scores. The countries also suffer from corruption trap in which the foreign direct investments depend on the country's ranking in the CPI and accepting western defined 'good governance' (see Heywood, 2016). They are trapped because for least resourced countries to tackle corruption by implementing 'good

governance' they need to withdraw the support they need. There are already steps ahead in the direction of improving index, such as introducing Bribe Payers index, which shows how likely is that the exporting firms of certain countries will engage into bribing (see The Guardian, 2013).

Still, level of corruption needs to be measured somehow, especially in order to investigate its relationship with the currency in circulation. The CPI, even limited, helps us to recognize the numerous challenges of corruption and one of them is how the choice of payments affects the level of corruption. Even with its flaws, this index impacts the global awareness on the issue of corruption (see Heywood, 2016), and as such, is still one of the most valid representatives of corruption states among countries worldwide.

The rest of the thesis is structured following background on the ways of payment and corruption in a literature review. I summarize first relevant studies that include empirical investigations which proved the impact of payment method on corruption as well as the different way of causality. Then I move towards developing nations and I outline the importance of modern payment methods in reducing the corrupted behaviour there. Finally, it ends with concluding remarks.

3 Literature review

In this chapter, the collected research is presented. All of them include a sort of empirical analysis in order to understand the topic and come to closest possible solutions and relevant conclusions. The empirical evidences are found in a connection between cash and corrupt activities, along with impact of electronic transactions on corruption reduction (section 3.1.1). Similarly, in the section 3.1.2, it will be shown how increase in usage of high denomination notes and cash in circulation can lead to more corruption (Singh, Bhattacharya, 2016). This is associated with the aspect of eliminating high denomination bills as an efficient tool in curbing the corruption (section 3.4), in which India tried to deal with the issue of corruption nationwide introducing demonetization in 2016.

The aspect of bi-directional causality between cash and corruption is presented in section 3.3., where it is evident that the way cash is used in companies depend on the

extent of corruption in a country. Another proof of reversed causality lies in section 3.1.3 where it was empirically tested whether the level of corruption affects the use of high denomination notes.

The aspect of more sophisticated methods of payment serving as a role of reducing corruption has more forms and it is divided in following sections. In the section 3.2, a related research has an empirical evidence of a decrease in corruption due to more developed financial system. In the section 3.5, the theory-based article is introduced which recognized agents and principals in the water sector in Tanzania. Applying Agency Theory, Krolkowski (2014) showed that paying for water bills through mobile-enabled methods reduces information asymmetries and therefore, bribing opportunities. Similarly, mobile-money systems that are introduced in developing countries, such as Kenya and Afghanistan, affected petty corruption, according to number of articles (section 3.6). Finally, this chapter will be completed with the aspect of cashless policy and introducing e-payment in public sector in Nigeria (section 3.7). They show signs of potential in reducing the extent of corruption, which is one of the highest comparing to other countries.

3.1 On the financial instruments and corruption

The first formal investigation whether the prevalence of different types of payment methods affects the prevalence of corruption comes from Goel and Mehrotra (2011). They showed that the cash is associated with corrupt activities, as well as that the transactions via electronic payment system tend to reduce them. It matters which choice of payment is done, as both the ratio of aggregate currency in circulation and ratio of large denomination banknotes significantly determine the corruption (see Goel; Mehrotra, 2012). Also, they showed that limitation in the supply of high denomination bank notes could be a tool to fight injustice activities.

Data from several countries in a period range of a couple of years were used in order to analyse on which level the different forms of payment instruments have a corruption predominance. For a measure of corruption, the authors used Corruption Perception Index by Transparency International and World Bank's Control of Corruption Index.

Bank for International Settlements and International Monetary Fund were good sources for the ratio of currency in circulation to narrow money and non-paper transfers as a share of total transactions (see BIS, 1999). In order to properly model the impact of different payment instruments on corruption, it was important to include all credit transfers, credit card transactions, orders to banks and debits.

The control variables are established controls of corruption, such as GDP per capita (income), government size, openness to trade, inflation, press freedom, democracy and economic prosperity. In the conditions where the opportunity costs of illegal acts are increased due to economic prosperity, there is a reduced level of corruption (see Bardhan, 1997). The most consistent determinant of corruption is GDP per capita, with its higher value tending to match lower corrupted nations. The government size is measured by the ratio of general government final consumption expenditure to GDP, which is positively correlated with bribing and other illicit activities (see Rose-Ackerman, 1999). World Development Indicators (WDI) is a good source for extracting both consumption expenditure of government and real GDP per capita. The literature suggests that they can be reduced by preventing branches of government from exerting too much power. The democracy variable represents the sum of a country's political rights and civil liberties scores with higher score symbolizing more democratic country (see Goel; Nelson, 2005). Freedom of press is measured by Freedom House on a scale from 0 to 100. The lower indices represent free press, enhanced transparency which leads to higher risks of corrupt acts (see Singh; Bhattacharya, 2017).

3.1.1 On the main findings

The researchers found in their regressions that share of non-paper based transactions is a statistically significant determinant of corruption and that the increase of it can cause a lower level of illicit activities. Additionally, it has been shown that the paper-based transactions are correlated to perceived corruption (see Goel; Mehrotra, 2012). Not surprisingly, credit card payments, being easily traceable, are positively associated with lower levels of criminal activities. Summary of main findings is presented in Table 3.1. The variables shown inside represent a share of non-paper based credit transfers (ShNPAPR), a share of paper-based credit transfers (ShPAPR), a share of cheque transactions (ShCHQ), a share of credit card transactions (ShCC) and share of direct debit transactions (ShrDrDbt). They all represent their share of total transfers in the non-banking sector (see BIS, 1999).

There are some attributes of cheques that can be shared with the characteristics of cash as well, which could explain the result of the use of cheques being positively correlated with the perception of corruption (see Goel; Mehrotra, 2012). Cheques are a paper-based way of payment and there is a higher chance of using it for bribing comparing to the non-paper transactions. In the research, it was also found that the increase in card usage had a much bigger impact in reducing crime compared to an increase in the share of paper payments attributing to higher corruption.

Not so consistent results were obtained for government size, as it is probably hard to capture all government activities with one variable such as the expenditure one taken from WDI. The alternative could be searching for similar measures of government size, like public service employment's ratio to total employment, or total public expenditures per capita. One other indicator of government size could be a total number of Ministries and Government Departments in a country.

Variable	Corruption Perception Index	Control of corruption index
<i>ShNPAPR</i>	-2,09**	-1,93**
<i>ShPAPR</i>	4,05**	3,60**
<i>ShCHQ</i>	2,14**	2,21**
<i>ShCC</i>	-30,91**	-26,88**
<i>ShDrDbt</i>	0,72	-1,41**
<i>GDP</i>	-0,00002**	-0,00002**

Table 3.1. The estimation results by pooled ordinary least squares using both Transparency International and World Bank's corruption indices. ** and * indicate statistical significance at the 5% and 10% level, respectively. (Goel; Mehrotra, 2012)

As a response to the revealed results, the possible policy propositions can be made. It is plausible that with the development of the financial system in the country, the level of corruption decreases. In a corrupted country it is important to promote the transition from the old-fashioned cash to more sophisticated ways of payment (see Goel; Mehrotra, 2012). One must be careful with some African countries such as Ghana and Kenya serving as a contradictory example. In these relatively corrupted nations, it is possible nowadays to make electronic transactions pretty much in every place. That still does not say anything about the use of cash so it would be in place to investigate how much currency is still in circulation there.

Another policy suggestion could be to set the maximum level of transactions made by cash (see Singh; Bhattacharya, 2017). Any form of the currency usage limitation could help divert the financial transactions toward electronic payment instruments.

3.1.2 Impact of cash on the corruption

Singh and Bhattacharya (2017) extended this research, showing that both large denomination bank notes and currency in circulation are significant determinants of the illicit activities. In the literature, they are divided into economic and non-economic determinants of corruption (see Chaudhry; Shabbir, 2007).

Those such as economic freedom, globalization, level of education and an average level of income are in the economic group and they are negatively related to a perceived level of corruption (see Chaudhry; Shabbir, 2007). Distribution of income is an exception. Additional ones that go into this category are investment, inflation, government size and openness. The openness is measured by how much a country trades out of the total GDP. The higher this share is, the bigger market competition which reduces the monopoly power of domestic actors and therefore weakens their ability to demand bribes (see Treisman, 2000). Inflation represents the annual percentage change in the consumer price index and there exists a correlation between higher inflation rate and bigger corruption (see Treisman, 2007).

The non-economic elements, including press freedom, democracy and share of population affiliated with a particular religion are either not so much significant as the economic ones, or influence corruption in the long run (see Chaudhry; Shabbir, 2007). The studies about corruption mostly revolve around the role of government and there has been only handful of research done about the role of payment system and its impact on the level of corruption.

Methods that were chosen by the researchers Singh and Bhattacharya (2017) depended on which corruption variable was used. Fixed effects model, which estimates unobservable country-specific effects that are assumed they are fixed, matched better with the Control of Corruption index. Random effects model was more appropriate when ICRG index was used as dependent variable.

The data about a ratio of large denomination notes to M1 (LCIC variable) were extracted from annual reports of the central banks of the countries that were included in the

research (see Singh; Bhattacharya, 2017). The two highest denomination bills are observed from each country with their sum representing their ratio to the total currency in circulation.

The plot of cash in circulation and the level of corruption showed that there was a negative relationship among them. Most of the high-income countries have lower levels of corruption and smaller share of cash in M1 simultaneously, while the higher cash ratio to narrow money was mostly correlated with corrupted, low-income level nations (see Singh; Bhattacharya, 2017). Estimation results of pooled OLS showed the similar direction in an increase of corruption and currency in circulation. One point of increase in cash in circulation (CIC variable) results in a decrease of World Bank's corruption index by 0,614 points (Table 3.2). Almost all of the control variables were statistically significant, except inflation and internet.

Variable	Pooled OLS	
	Control of corruption index	ICRG index
<i>CIC</i>	-0,614***	-0,775***
<i>LCIC</i>	-0,609***	-0,584***
<i>GDP</i>	0,498***	0,481***
<i>GOV</i>	-0,017***	-0,028***
<i>Internet</i>	0,001	0,005***

Table 3. 2. Relation between corruption and cash in circulation estimated through pooled ordinary least squares.
*** indicates statistical significance at the 1% level. (Singh; Bhattacharya, 2017)

When the regression was made using static panel data model, even they were significant, at least at the 10% level. Internet even showed constant significance in all models and in both dependent variables, with more internet users in a country contributing to less corruption (see Singh; Bhattacharya, 2017). Similarly to press freedom, it creates more transparency and less information asymmetry. The estimation results showed that there is a prevalence of corruption in low-income countries, as the one percent increase in GDP results in an increase of corruption indices by 0,41 unit (Table 3.3).

The negative sign of the cash in circulation and large denomination notes coefficients confirms that both are statistically significant cross-country determinants of corruption. The ratio of high denomination bills has a bigger impact. One unit increase of their usage (LCIC) results in a rise of control of corruption unit by 0,3; comparing to 0,2 unit for an

increase of a total cash usage (Table 3.3). On the other hand, with ICRG as the index, the large denomination notes have no significance.

Variable	Static panel data model	
	Control of corruption index	ICRG index
<i>CIC</i>	-0,198***	-0,365**
<i>LCIC</i>	-0,299***	-0,305
<i>GDP</i>	0,362**	0,413***
<i>GOV</i>	0,009*	0,026
<i>Internet</i>	0,003**	0,005*

Table 3.3. The regression results of the static panel data models: fixed and random effects models. ***, ** and * indicate statistical significance at the 1%, 5% and 10% level, respectively. (Singh; Bhattacharya, 2017)

Dynamic panel data model was used to show the effect of the past level of corruption and the result is statistically significant that the corruption remains unchanged. Similarly to the static model, one unit increase in cash in circulation enhances control of corruption by 0,16-0,2 unit (see Singh; Bhattacharya, 2017). The impact of large denomination notes is now weaker compared with the effect of total cash in circulation on corruption. So even after removing the problem of currency correlating with the error term, its increase of usage in circulation still raises the level of corruption.

3.1.3 Different direction of causality

A different direction of causality is not excluded as it is possible that the level of corruption also precepts the instrument of payment chosen and that central banks are pressured to supply the demand with cash. This was empirically already investigated (see Singh; Bhattacharya, 2017) by Granger causality test (Table 3.4). The analysis showed that cash in circulation in past leads to higher corruption in present but that corruption in past does not impact the usage of currency in the present period. However, with the large denomination notes, not only that their previous usage affects corruption in present but the past level of corruption increases payment with high bills as well.

Direction of causality	Lags	Joint Significance
<i>CIC</i> → <i>CC</i>	1/2	4,54*
<i>CC</i> → <i>CIC</i>	2/2	1,39
<i>LCIC</i> → <i>CC</i>	1/1	6,16**
<i>CC</i> → <i>LCIC</i>	2/2	8,12**
<i>CIC</i> → <i>ICRG</i>	1/1	6,09**
<i>ICRG</i> → <i>CIC</i>	1/1	1,61
<i>LCIC</i> → <i>ICRG</i>	1/2	3,78*
<i>ICRG</i> → <i>LCIC</i>	2/1	3,98**

Table 3.4. Granger causality test of currency in circulation and corruption indices. **, * denote statistical significance at the 5% and 10% level, respectively. (Singh; Bhattacharya, 2017)

Supported by the empirical analysis among developed nations, the encouragement of electronic larger transactions by minimizing credit card fees that banks charge could at least contribute in fighting corruption (see Goel; Mehrotra, 2012). As the Granger causality test results suggest, the corrupt environment could impact the higher usage of large denomination bills, which leads to an idea of their printing limitations (see Singh; Bhattacharya, 2017). This can even go further with withdrawing these bank bills from circulation, what has been the case already in the past. As the lack of large banknotes would increase significantly the transaction costs of corruption, this would lead possibly to faster results comparing to the changes in the government institutions for reducing crime activities.

Considering that most studies did focus the role of government in anti-corruption policies and that the main issue is big transaction costs, an alternative could be moving the direction towards relatively costless, payment system-related option with central banks as main actors in limiting injustice activities (see Singh; Bhattacharya, 2017). The detailed examination of printing high-denomination banknotes and its institutional mechanism would give a clearer picture of central bank's independence and how does it affect nation's corruption.

The additional note goes to the fact that it is hard to capture all corrupt transactions in this study, as they are also made in foreign currency or other possessions like gold. This makes the proposed policies for fighting corruption limited as they focus on transactions made in domestic currency (see Singh; Bhattacharya, 2017).

3.2 On the financial development and corruption reduction

Another investigation of the relationship between level of corruption and the financial progress, including innovations in ways of payment was done by Altunbas and Thornton (2012). They estimated how bank credits given to private sector affected corruption and found a causal link among them. It is no doubt that finance maximizes the performance of firms in a form monitoring by banks and making sure that the aid flows they provide are properly used (see Tavares, 2003). These credits seem to have a negative impact on corruption, as one of the key elements of financial development.

In the analysis to measure corruption the already mentioned International Country Risk Guide index of corruption was used. The financial development was weighted by the bank credit to businesses that are not owned by government as a share of GDP in 107 nations (World Bank's WDI database). During the tests the usual control variables were used, such as democracy, parliamentary system, political stability and freedom of press, colonial heritage, predominant religion.

Performing ordinary least squares regression and deriving also instrumental variable estimates on bank credit data as a ratio of gross domestic product showed statistically significant negative coefficients (see Altunbas; Thornton, 2012). This was interpreted as a decrease in corruption due to rise in bank lending to private sector, being negatively associated with illicit activities. The results suggest that the more developed financial system in a country leads to less discretion of country's officials and lower level of corruption. It is consistent with the studies of Goel and Mehrotra (2012) in which more credit card transactions, as developed financial settlement mode, lead to decreased corruption.

3.3 On the role of corruption in the evaluation of cash reserves

In the institutional context, the analysis has been made of the relationship between cash holdings and firm's performance, considering the effect of corruption (see La Rocca; Cambrea; Cariola, 2017). Corruptive activities may impact the relation among liquidity and business performance. This was investigated empirically as the positive association among cash holdings and performance depend on few factors, such as distinguished characteristics of companies or the institutional framework in which they perform. They have proved that the level of corruption affects the intensity of the value of holding cash, as the use of cash stocks can be exploited for illicit activities. Evidently, in the economies

with a high level of corruption holding cash can lead to decreased performance of the firm. On the other hand, within the environment of the greater control of corruption cash holds can increase business performance.

If a firm operates in a more corrupted country, the value of their holding cash may differ than in an institutional context with low levels of corruption. Instead of enjoying the values of bigger financial flexibility and easier access to credits, cash stock in corruptive surroundings can create opportunities to management for bribing and donating to specific persons with position or authority, in order to obtain personal benefits (see Chen, 2011).

The literature concerning how much the connection between cash reserves and performance of the firm is contingent to a level of corruption suggests that in more corrupted nations holding cash can create inefficiencies and decline in the business performance (see Chen, 2011). Maximizing shareholder wealth is not possible because currency stock is being used for corrupt activities. On the other hand, it is possible to use that cash for investment and therefore increase the attainment of the company in countries with lower levels of corruption, where the investors and management share same interests (see Kalcheva; Lins, 2007).

Italy was chosen in an empirical research because of excess administration and red tape contributing to the corrupt behaviour. It negatively affects the Italian economy as the directors use cash holdings for their private interest and not for economic growth. A good potential for corruption is induced by a complicated and weakly applicable law system which results in ignoring the capital market participation (see Dittmar; Mahrt-Smith; Servaes, 2003).

The firm's performance was measured by their return on assets while corruption was captured by two indices, the Corruption Perceptions Index and Control of Corruption. On a scale from 0 to 10 value of Transparency International index, 10 meaning no illegal activities, Italy's value is 2,60, which means a pretty high level of corruption. The researchers created their own model (see La Rocca; Cambrea; Cariola, 2017), where the performance of the company was the function of cash holdings, moderator and control variables and product of cash holdings and corruption index. They used fixed effects model for the regression. The product of cash reserves and corruption indices used in the model had negative and significant coefficients which confirmed positive relationship among liquidity and firm's attainment. The latter was increased in companies that

perform in less corruptive surroundings, contrary to the ones which are situated in areas with high levels of illicit behaviour.

It was empirically proven that the positive association between cash reserves and firm's performance is eliminated in corrupted areas of doing business (see La Rocca; Cambrea; Cariola, 2017). In a long-term, bribing and general illicit activities simply do not pay off and lead to a decrease in company's performance. A study like this confirmed that corruption is bad for the economy but it also showed the importance of the reverse causality among cash and corruptive behaviour. Although the focus was on the firm's performance and how it is contingent to institutional context in which they operate, there are indications that this corruptive environment impacts the payment instrument that is chosen. The role of the currency is directed towards facilitating grey economy as cash reserves will be used for illegal transactions and dishonest schemes due to higher levels of corruption.

Based on these conclusions, a marginal contribution to the study would be to include investigation of a relationship among cash holdings of firms and level of corruption alone, leaving the business performance out of the picture. It would be interesting to study if there is a causal effect of company's cash reserves on the corruption and if there is, the policy toward limiting high denomination notes could be appropriate.

3.4 On the demonetization in India and corruption

In a relation to the influence of reducing high denomination notes on a level of corruption, the recent case of demonetization in India serves as a possible example for future, examining both advantages and its flaws. India's government decided to, in order to tackle corruption and black money, withdraw two highest denomination notes from the circulation (see GOI, 2016). Those were 500 and 1000 Rupee bills, which constituted almost 87% of total currency.

Due to a large number of corruptive behaviour and income concealment, there is a lot of black money generated on which tax has been evaded. As most of the illegal activities, such as smuggling, trafficking and terrorism are associated with the use of cash, India's government intervention towards removing highest denomination bills out of the system seems plausible (see Tiwari; Khan, 2017). Even though such policy came as a shock for many low-income households and farmers in a country where 68% of total transactions are made in cash, the surveys showed that in general public is satisfied with

demonetization as a way of involvement in fight against corruption (see Times of India, 2016).

The estimates for black money in India from 1973 to 1983 had a range from 15 to 21% of GDP, with the most recent one in 2012 being 10%, according to National Institute of Public Finance and Policy. Another estimation done by three economic research institutes in India resulted in an assessment of black money of around 30% of GDP in 2013 (GOI, 2012). This represents major drawback to the economy as there is a waste of potential in development and growth of a country.

According to Corruption Perception Indices, India dropped more than 20 positions on a rank from 2006 to 2011 and till today are yet to climb up to their original 70th position from more than 10 years ago (see Transparency International). Politicians and administrative officers are heavily involved in the systematic corruption in India, paying bribes to abuse entrusted power for private gain. Highly ranked bureaucrats and private sector managers being competitive in acquiring certain goods or services and bank frauds are not excluded from cases of bribing (see RBI, 2017). Such activities serve as a major source of black money in the nation.

One of the main objectives of demonetization was to discourage corruption and reduce bribing opportunities by decreasing use of paper money in circulation. This was followed by the fact that there has been a lot of forged bank notes which was disrupting the economy. By eliminating two largest denomination banknotes from circulation the forged ones also lost their significance (see GOI, 2016). Also, as in many other developing countries, a large number of cash seizures made by enforcement agencies serve as evidence of using high denomination notes for storage of wealth made by criminal activities (see Tiwari; Khan, 2017).

The withdrawal of India's two highest denomination bills resulted in 97% of notes being deposited in banks (see Times of India, 2017). Simultaneously with the termination of bank notes the actions of seizures have been organized with government successfully capturing huge amounts of stacked paper money and gold acquired from illegal activities. Additionally, the announcement of 0,75% discount on electronic payment for fuel helped to motivate and expand digital transactions not just in gas stations but in all commercial zones across the nation (see Tiwari; Khan, 2017).

Further actions towards fighting corruption and injustice activities were done in the direction of checking properties in which black money is being invested, as well as giving

an opportunity to declare income with 33% surcharge and 10% penalty in a three month period (see Tiwari; Khan, 2017). Cash restrictions in a form of setting the threshold to which transactions with currency are possible should be added along with all these government measures

3.5 On the role of mobile-enabled payment methods in reducing petty corruption

In the idea of non-cash payment methods influencing the level of corruption, a study has been done observing water sector in Tanzania, where the new, electronic ways of paying the water bills were introduced (see Krolikowski, 2014). Due to the ability of the mobile means of payment to reduce information asymmetries, they also help reduce the petty corruption in the whole payment process for urban water sector services. This research included interviews with the water sector employees, banks, telecommunication operators as well as a random sample of water utility customers. This electronic way of paying bills has the power to make the whole payment process more transparent. Furthermore, it has the ability to involve the customers more in the improvement of the water sector, using effectively human resources.

Africa's urban water sector is a good potential place for illicit activities, bribing, fraud and another corrupt behaviour due to inadequate, old-fashioned mechanisms of revenue collection and customer services. The introduction of a mobile-enabled method of paying water bills in Tanzania not only sees an improvement of the water sector mechanisms of billing and collection of fees but also tries to tackle corruption as well (see Krolikowski, 2014). The rent-seeking behaviour and administrative corruption of utilities in Africa lead to poor investments, which can be improved by mobile technology payment innovations which contain more information in order to fight informal payments and false meter readings.

Krolikowski (2014) applied agency theory to show and explain the main relationship between mobile payment applications and petty corruption in water utilities. Throughout the analysis of the main factors that contribute to petty corruption, data collection from surveys and interviews and investigation of the payment choice influence on corrupt behaviour it was shown that the innovations in billing and payment can not only reduce

the corruptive opportunities but also impact the relationship between customers and utility service (see Krolikowski, 2014).

The source of bureaucratic corruption in water utility sector lies in such environment where customers and utility staff need to interact often due to a high demand for water services. This gives such institutions a discretionary power, low transparency and a solid chance of bribing opportunities, as customers have very limited options to complain or give any kind of feedback. The most common opportunities for corrupt behaviour is found in informal payments of repair work and frauds during the meter readings. The more information is available for customers, as well as enhancing the competition in payment methods, can reduce monopoly and discretionary power of institutions and illicit activities (see Davis, 2004). This information-sharing between customers and utility staff increases the risk of employees such as meter readers and cashiers getting caught during the injustice and misconduct behaviour.

Recently there has been a rising trend of mobile phone subscriptions across the African continent. As a result of their use in the payment process the information asymmetries are reduced, due to new options available to customers such as depositing, withdrawing and transferring money through SMS messages (see Jack; Suri, 2011). The clients have more access to information through SMS such as billing reminders and account balance which contributes to the greater risk of sanctions being applied to corrupted agents. All the utility bills that were traditionally paid by cash at the counters in the bank or institutions can now additionally be done electronically on the phones. Another more convenient paying alternative is the GPRS wireless pay points, where customers can do the transactions in a similar way that is done in the water payment offices (see Krolikowski, 2014). The advantage of these pay points comparing to the offices is that they are located usually more frequent across the cities and they are closer to clients.

Exactly because of the existence of asymmetries in information and high monitoring costs in water utility performance, it is logical to apply Agency Theory to the study. Employees in water utility services represent the agent and principals are people who use water from the system and pay for this service. They have difficulties overseeing the agent, who is in an advantageous position for possessing more information and therefore abusing its position, making corruption possible (see Krolikowski, 2014). Agents also own discretionary power and get the excess payments from individuals through bribing and informal payments. In order to decrease petty corruption, it is of a great importance to reduce discretionary power of agents and opportunities for extra payments, as these

conditions are more controlled by agents (see Krolikowski, 2014). Principles have more power in enforcement mechanisms and penalties, which depend on the probability of being caught in corrupt activities. Making these mechanisms and laws stronger increases the risk of illicit actions (see Jain, 2001). It is also possible to offer an alternative for not engaging in corruption through business interventions.

Competition also breaks corruption, as the competition rises, there are more market opportunities which make it harder to exploit the transactions (see Krolikowski, 2014). That is why it is important to include more, transparent methods of payments, such as the mobile one, which can influence all the conditions that typically stimulate corruptive behaviour.

3.5.1 Analytical approach and surveys

There is a rising trend of mobile-enabled transactions made in water utility in Tanzania, especially through wireless pay point channels. Methods and analytical approach include the analysis of the perception of corruption separately for each payment way through interviews and survey methodology based on existing literature (see Davis, 2004) conducted among customers in both public water and telecommunications sector, civil societies and banking institutions. It included standard questions about location, house conditions, demographics, socio-economic variables, but also things related to study such as mobile phone use, payment methods and quality of water service (see Krolikowski, 2014).

Four different payment methods were distinguished: paying at water office, bank branch, wireless pay point or through mobile money. The payment process starts at meter reading, then follows by data entry, bill generation, bill distribution, payment of bill and finally, balance inquiries. For all payment methods, the first four steps are the same, with a difference for bill generation and bill distribution at mobile money method, in which it is done by IT staff instead of manual entry of billing officer (see Krolikowski, 2014). Through data analysis, all factors that stimulate petty corruption were captured and those are monopoly power, competitive pressures, discretionary power, economic rents, enforcement mechanisms, monitoring costs and information asymmetries.

The rates of all services of payment influence to what extent there is a monopoly power in one particular way. For the Dar es Salaam's case in Tanzania, this power overpayment was held by water utility provider until the mobile-enabled payments were introduced. Even though the most revenue of water utility services is still collected

through offices, there is a slow trend in paying over wireless pay points, with more than 2000 locations around the city and accounting 6,3% of total bill payments (see Krolikowski, 2014). The introduced method influenced the actual decline in staff who collect revenues in offices. The other two payment methods, bank branches and mobile money accounted for total just a little more than 2% of payments. The advantage of innovative payment collection method is larger availability and therefore closer locations for the payers to do it.

In terms of competitive pressures, five characteristics were observed among the various payment methods. It turned out the interval between the date of payment and reflection of it on the account was longest with bank branch (7 days) while with mobile-enabled methods it was immediate. Similarly, with the availability feature, those methods are available far more than the traditional ones. It is possible to pay with mobile money any hour of any day and even wireless pay points are available three times more comparing to bank branches opening hours (see Krolikowski, 2014). In comparison, during the weekends and holidays, offices are closed when most customers also have time for payment because they are off work. While in only 13 neighbourhoods of Dar es Salaam it is possible to pay at the water utility offices (bank branches in 29 neighbourhoods), mobile-enabled methods cover all areas (see Krolikowski, 2014). The effectiveness of mobile money method is even prolonged by the fact there is no transport method needed to make the payment using it, while with other methods it is required to at least walk or use some kind of vehicle or public transport.

Although there are plenty of advantages of mobile technology innovations in payment system, people are still getting used to them as it is all relatively new for them. Its efficiency and easiness to use should keep contributing to the declining trend of old-fashioned ways of payment in the water offices, with its low-quality ink pay receipts. The only advantage water office still has is the customer service which is simply impossible with mobile communication technology (see Krolikowski, 2014). Nevertheless, the point is that this technology enhanced the competition among payment services, for the benefits of customers.

The more interactions the workers in water utility have with customers, the larger their ability to design and administer special services, as well as a chance for them to exercise this precise power. It is their job to read meters, distribute bills and disconnect unpaid households. Most unofficial payments occur during preventions of disconnections due to unpaid bills and negotiations between customers and meter readers, who clients

often find deceptive and inactive (see Krolikowski, 2014). This makes customers feeling like they've taken advantage, weak and unprotected. Even though in the bank branch method of payment the bank workers hold some unrestricted power, it is very limited as they often only take and register payments and nothing more (see Krolikowski, 2014).

Office managers and meter readers hold highest discretionary power, while cashiers are at the intermediate level. The commercial assistants usually spend a lot of time during work unsupervised due to nature of their job, which makes possible for petty corruption to happen during the agreement process over disconnections (see Krolikowski, 2014). The operators in wireless pay and mobile money have a low level of discretionary power, as well as tellers and managers in banks.

Another element in which context the petty corruption occurs is the excess payments that are made during the transactions. In the water sector, this element can be avoided by introducing mobile communication technology-based methods of payment. That way the incorrect amounts and rounding the amounts are reduced to a minimum as well as the probability of money getting stolen (see Krolikowski, 2014). Also, commercial assistants take advantage of the negotiations in a sense that they receive more money than the connection is worth so the difference in price is kept for their private use. Moreover, the costs of handling cash are gone with the mobile-enabled payment method. All these advantages lead to restricting economic rents in the water sector in a significant way.

Observing the actors who capture economic rents, it is obvious that the most of them exist in the water utility staff. In other ways of payment in which the actors include bank staff, pay point operators and mobile network operators there is hardly any evidence that the petty corruption occurs during the payment process (see Krolikowski, 2014). The nature of cash, being anonymous and leaving no transaction record allows the cashiers and commercial assistants to receive excess payments often. On the other hand, the payment done through a mobile-enabled channel is recorded and transparent so it is much harder to take advantage of it.

Another potential for petty corruption in water sector comes from the probability of getting caught, which is low in traditional payment method through offices using cash. In all other payment methods, this probability is high, due to strong enforcement mechanisms, which prevent manipulation and theft (see Krolikowski, 2014). The effects of petty corruption there are big and harsh, such as immediate employment termination. The likelihood of sanction being applied is low in payments made in water offices, while it is intermediate

in other methods. The rules for the staff working in banks and wireless pay points are much stricter comparing to those for water utility office workers. This also comes from the fact that they have longer lasting positions at their jobs already.

The difference among payments made at the water offices and payments are done electronically also lies in the record of the transaction. While wireless pay points and mobile-enabled payment channel produce automatic and transparent electronic record, cashiers at the office have to enter payment information manually. This characteristic makes it possible to manipulate records to a certain level and that is hardly possible to do with electronically generated receipts (see Krolikowski, 2014). On the other hand, SMS confirmations of payments and electronic records are not suitable for tracking and control, comparing to the physical proof that is generated by paying water bill in the office. This receipt's feature of being detailed and long lasting makes it possible for principles to check records and control the agents with less cost. Although this supervision is more difficult through electronic channels due to lack of hard copies of receipts, the mobile technology applications assure that payments made this way give customers more confidence as they are not subject to manipulation (see Krolikowski, 2014).

Wireless pay points and mobile-enabled payment method give customers more information about their transaction records due to SMS-based balance requests that are provided by mobile network companies that are in charge for water sector revenue collection (see Krolikowski, 2014). Conversely, the availability of this information through payments made in water office is very low, with a high cost of obtaining it as the customers would have to physically go there and request information from employees. One of the drawbacks of the payments made through mobile money services has to be the occasional mistakes customers make like putting the wrong account number (see Krolikowski, 2014). This happens due to the technology innovations and people taking time to be familiar with them. Not only these mistakes leave the customers' bills unpaid, but also the water sector cannot credit their accounts which can lead to disconnections. Still, the payment service operators serve as the transparent channel that reduces the information asymmetries and gives more access to payment information for everybody. The more customers are familiar with payment information and data, there is a less chance for petty corruption and less opportunity for water utility employees to exploit these imbalances.

Through this study, there have been significant proofs that the non-cash payment method influences petty corruption by reducing it due to its increased transparency and decreased information asymmetries. Furthermore, it has stronger enforcement mechanisms, decreases economic rents and reduces discretionary power held by agents. Previously we saw that payment instrument matters and affects the level of corruption (see Goel; Mehrotra, 2012) and this study confirms that mobile technology innovations reduce corruption in utility sectors.

3.6 Mobile money system in developing countries and corruption

The case of M-Pesa serves as a good example of the mobile-money system where various types of payments have an impact on the level of corruption. M-Pesa is a mobile phone-based money transfer service as a part of the largest mobile network operator in Kenya and Tanzania. In The Economist's article "Why does Kenya lead the world in mobile money?" (2013) M-Pesa's key points were presented. Kenya example is interesting for my study because it represents a case where the economic development of a country and development of its financial system is not correlated. Western nations already caught up with technology, using new, more sophisticated methods of payment for transactions with a relatively lower level of corruption in comparison with the rest of the world. Yet, Kenya, the world leader in mobile money, is ranked in the bottom 30 nations by Corruption Perceptions Index 2016 (Transparency International).

Kenya is one of the countries having many rural villages where many workers' families receive money from their relatives who work in cities. M-PESA's feature of easy mobile transfer of cash from one account to another made this process easier, safer and quicker (see The Economist, 2013). More than 60% of adult population in this African nation take advantage of these qualities, also due to company's smart marketing strategy, good networking and minimum cost associated with handling cash.

The mentioned mobile-money system shows signs of creating more small businesses, improving population's income and as every other cashless method of payment offers faster-paying bills and getting salaries on their accounts (see The Economist, 2013). Having stressed that, the question must arise, how with all these possibilities and financial system improvements, corruption further evolves even in the digital age?

The answer to this question tries to come from the Financial Times article (2016) which shared an existence of abusing the same mobile system by people in power, more precisely, Nairobi's police officers. The transparency feature of the electronic way of payment revealed a lot of suspicious activity on their Mpesa accounts as a result of extensive corruption network (see Aglionby, 2016). The illegal activities were referring to the relocation of fixed amounts of money from some junior officers to their senior colleagues.

Another more personal experience of petty corruption came from Aglionby (2016) who found himself being pulled over on the road by an officer in the traffic department. After he tried to get out of the situation by pleading to be let off with a warning, the officer refused but then offered a foreigner to pay half of the fee for not getting a receipt. The condition was to do that in cash only. Naturally, as the Mpesa transaction would reveal another suspicious activity on officer's account.

The number of cases like this serves as an evidence, that, even though there are signs of improvements of the corruption in this African nation, it is still a long way to go as the behaviour of corrupted individuals does not change easily.

One of the possible places where cashless payments can fight petty corruption is in Kenya's public transport system. As the drivers and conductors are regularly extorted by traffic police demanding cash from the passengers in the bus, the switch to electronic paying system that is traceable and controlled would reduce paying bribes in public transit service (see Binette, 2016). Yet again, due to habits and corrupt behaviour of people with power, the improvements are really slow. Cash is still accepted in buses as people are used to it and it takes a lot of time to change their preferences in terms of paying for their goods and services. The nature of corrupt individuals makes them misuse people's lack of knowledge about the new system by confusing the passengers who are then forced to carry currency with them (see Binette, 2016).

Observing the case with mobile payments in Tanzania's urban water sector (see Krolikowski, 2014) and its influence on petty corruption, it is hard not to be optimistic about the possibilities in Kenya's plan about the public transport as well. The more people complain and give negative feedback to the service provided, the faster will corrupt workers be eliminated from their positions, as a result of referring back feedback received to the government (see Binette, 2016). With almost every Kenyan owning a mobile phone and Mpesa account this idea seems very plausible.

Another positive impact of introducing mobile-enabled financial services was found in Mpesa expansion to Afghanistan (see Unibul's Money Blog). Only after police force started receiving their salaries through Mpesa accounts they realized in the old system they had been regularly cut by middlemen due to a corruption network that had been created. In the newly introduced electronic payment system, the salaries were corrected and the cuts were no longer possible, preventing illegal activities from happening again.

Although there are positive signs of reducing petty corruption in developing countries by introducing the advanced financial system and payment methods, its impact on the actual state of corruption in the country is still uncertain. These countries have a long way ahead as there is a lot of space for improvement in corrupt actions. Yet, in order to get there, the changes have to start somewhere. Mpesa and Tanzania's mobile-enabled payments in water sector both serve as proof that these countries already started their path forward in tackling corruption.

3.6.1 Relationship among mobile phones and decrease of corruption

It was evident that mobile communication technology helped in reducing bribing cases and corruptive behaviour in Tanzania's water sector by allowing customers to pay their bills with their phones and therefore promote transparency as well as a decrease of information asymmetries (see Krolkowski, 2014). Similarly, a study by Kanyam, Kostandini and Ferreira (2017) showed that growing use of mobile phones can be beneficial as a tool in a battle against illicit activities. Their empirical testing revealed that mobile phone penetration affects corruption and not the other way around.

The paper acknowledges the rising trend of mobile phone use in many African countries, including M-pesa in Kenya, which was already noticed earlier (see The Economist, 2013). In some of the nations, the total number of mobile accounts precedes the sum of bank accounts (see Cable News Network, 2014). Power of mobile phones in fighting corruption also lies in their prospect of reporting bribing cases through mobile messaging to authorities. Mobile technology innovations allow reaching to voices that were not able to be heard before and therefore boosting the accountability of public officials. The existence of such strong anonymous reporting platform through SMS, hotline and phone applications has a great impact on combating the corrupted behaviour (see Kanyam; Kostandini; Ferreira, 2017).

The researchers used Control of Corruption Index which they found more appropriate for the study as it includes bribing activities in business surrounding as well as political corruption (see Kaufmann; Kraay; Mastruzzi, 2011). Their data is consisted of 44 Sub-Saharan nations in a period of 13 years and contains information about subscriptions to a public mobile telephone service using cellular technology (number of subscribers per 100 persons for each country from World Bank's WDI database) which I found relevant for thesis as certainly the mobile-enabled payment method would not be possible without possessing the actual phone. After plotting the data it was shown that there is a negative correlation among mobile phone subscription and corruption (see Kanyam; Kostandini; Ferreira, 2017).

Both static panel and dynamic panel data models were used in the research. Random effects model resulted in the significant impact of mobile phone subscription to perceived corruption. An increase in mobile phone subscription leads to decrease of the anticipated level of corruptive acts on a statistical significance at the 1% level (Table 3.5). There was no significant result in the effect of economic prosperity to corruption, but rule of law and government effectiveness are disadvantageous to a level of perceived corruption (see Kanyam; Kostandini; Ferreira, 2017). Rule of law is a measure of institutions quality and its increase meaningfully curbs corruption in the research. Fixed effects model was also compared with random effects model and it showed consistency with the negative impact of mobile phone usage on bribing cases.

The reverse causality was checked and it showed that only mobile phone usage causes a cutback in corruptive activities. The control variables such as press freedom, population and inflation did not show big significant coefficients across all the models used (see Kanyam; Kostandini; Ferreira, 2017). Dynamic panel data model presented similar results to the static one with significance in coefficients and influence of using mobile phones on the level of corruption in Sub-Saharan Africa. Such empirical investigation suggests that everyday use of mobile phones, including its payment possibilities should be encouraged in anti-corruption measures (see Kanyam; Kostandini; Ferreira, 2017).

Variable	Control of corruption index		
	Random effects	Fixed effects	Dynamic panel data model
<i>Log (Mobile phones)</i>	-0,0817***	-0,0907**	-0,0313**
<i>Economic prosperity</i>	0,0000185	-0,0000464	0,0000142
<i>Log (Internet)</i>		-0,0280	
<i>Press freedom</i>	-0,000343	-0,000214	0,000379
<i>Rule of law</i>	-0,284***	-0,261**	-0,188*
<i>Government effectiveness</i>	-0,569***	-0,600***	-0,320***
<i>Population</i>	0,00237*	0,00296	0,00422
<i>Inflation</i>	-0,000000727	-0,00000233	0,00000115

Table 3.5. Empirical results of static panel models and dynamic panel data models. ***,** and * denote statistical significance at the 1%, 5% and 10% level, respectively. (Kanyam; Kostandini; Ferreira, 2017)

3.7 Tackling corruption in Nigeria

Nigeria serves as an example of a very corrupted nation that tries to fight illicit activities by introducing more developed ways of payment in order to reduce significantly interactions among public officials and citizens and therefore reduce the level of corrupted behaviour. In the following section, the related study on Nigeria's ways to fight corruption is presented.

3.7.1 On the cashless policy and its impact on corruption

Contributing to the existing literature about financial modes affecting the level of corruption is the research of Nigeria's cashless policy towards reducing corruption and enhancing sustainable development in this country, done by Jatau and Dung (2014).

The article mentions the well-known spread of electronic ways of payment in African nations, including M-Pesa in Kenya and smart card payment system in Ghana. Cashless payment instruments are evolving together with mobile communication technology and have begun to touch Nigeria as well. Currency is still largely popular in the country which can be a challenge for encouraging customers to accept financial innovations. Paper money is present everywhere also due to socio-cultural factors, as wedding and birthday

gifts in cash are popular along with the offerings in the church or giving to the poor (see Jatau; Dung, 2014).

Nigeria's Central Bank set goals of reducing the use of currency in a country by implementing cashless policy. It includes reducing the cost of banking services, more effective and modern payment systems and adequate banking transactions (see Central Bank of Nigeria, 2011). Additionally, the integration of mobile technologies and more sophisticated payment methods can minimize the consequences of inflation slowing down the development of the economy.

Modernization and drive for Nigeria to be among the best economies in the next decade (see Central Bank of Nigeria, 2011) goes along with the promotion of electronic methods of payments for goods and services. The biggest challenge with the implementation of e-payment systems is the level of literacy in Nigeria as banking customers would have difficulties adopting the new technology which consumes a lot of time and effort. A large ratio of Nigerian population represents uneducated illiterate farmers (see Jatau; Dung, 2014). Moreover, the nation faces poor infrastructure facilities, including bad power supply and low internet access.

Adopting the digital money as an instrument for payment is of a great importance for tackling exchanges of benefits and illegal payments. According to Corruption Perceptions Index in 2016, published by Transparency International Nigeria is ranked among the 40 most corrupted nations in the world. Being rich in oil, unfortunately, does not help the country due to systematic and institutionalized corruption, where all gains are acquired by few corrupted public officials (see Jatau; Dung, 2014).

In order to investigate the impact of electronic payments on revenue of the government, data was collected from the Plateau State Board of Internal Revenue, Nigeria (see Zaccaro; Bader, 2003). It includes both manual and electronic revenue collection. The evidence of a higher increase in revenues after introducing the electronic revenue collection proves that a lot of money that was collected traditionally by cash or paper money in the past was concealed by participants in the illegal economy (see Jatau; Dung, 2014). The cashless policy started in 2012 and already saw a huge increase in revenue collection by 53%. Furthermore, in 2013 with monthly internally generated revenue collection data, saw incredible 132% increase compared to the 2011 data when the paper money revenue was collected manually.

Switching to the cashless system all payments are now documented which serves as an effective base for optimal revenue generation. This transparent process reduces automatically financial corruption as there exist no more cash funds that served as a diversion in the past (see Jatau; Dung, 2014). A right direction towards financial development is a great necessity especially for a country like Nigeria which suffers from pathological corruption. Corrupted behaviour is about to change with the enhanced monitoring and auditing and encouraged accountability that electronic payment system brings.

3.7.2 Empirical approach on cashless economy

To try answering the question of how can the cashless economy reduce the corruption in Nigeria, the study of Mieseigha and Ogbodo (2013) was also observed. An empirical analysis of the relationship between the cashless economy and the reduction of currency-related crime was performed. The methodology they used was based on questionnaire offered to more than 400 educated Nigerians in order to collect relevant data. The survey consisted of 10 questions related to benefits of cashless policy in consideration of transparency and reduction of cash-related illegal activities.

Results showed that almost two-thirds of respondents think that switch to electronic payment method would reduce corrupt behaviour and crime activities induced by use of cash (see Mieseigha; Ogbodo, 2013). Half of the respondents believe that digital payments would result in a more transparent economy.

Chi-square test demonstrated results that led to the conclusion in favour of positive and significant connection among cashless economy and illegal activities, including corruptive behaviour. It showed similar results when asked about cashless transactions influencing economic growth and development (see Mieseigha; Ogbodo, 2013).

This research does not just serves as an example of the cashless economy being essential to Nigeria's development and reduction of illicit activities and but also goes along with the already mentioned studies about a relation between the way of payment and level of corruption.

3.7.3 On E-payment in public sector

Another study that tries to tackle corruption by minimizing interactions between government officials and the public, similar to the water utility sector corruption study case in Tanzania, is presented by Ogedebe and Babatunde (2012). They investigated

the challenges of implementing electronic payment system in Nigeria in favor of many prospects that could reduce significantly bribing opportunities in the nation.

The money as a mean for exchange in trade evolved in its form from bank notes to digital payment system, that uses advantages of the progress made in information technology. E-payment regime assumes performing all government financial transactions through the means of electronic communication channels and Nigeria introduced it starting 2009 (see Ogedebe; Babatunde, 2012), as one of the responses to the massively corrupted behaviour that infected the nation.

There is a room for corruption in Nigeria due to huge delays in government officials when it comes to paying to contractors or salaries of the workers. The well-known transparency and automatization of a developed financial system can speed up transactions, make payments more convenient and significantly reduce the bribing opportunities as corruption tracking agencies use the detailed trace of payment transactions in an accounting record in cases of investigation (see Ogedebe; Babatunde, 2012). This undoubtedly shrinks the unnecessary communication among contractors and officials and reduces the risk of fraud and robberies, as large sums of cash are attractive to crooks and criminals.

Even within the electronically enabled payment system, there are different types of e-payment and they differentiate in the automatization of the steps in the processing. Nigeria currently has the manual method where still some steps in the process are hand-operated (see Ogedebe; Babatunde, 2012). Of course, the ultimate goal would be an ideal e-payment where all the payment moves and approvals are digitalized. In order to achieve that there has to be a lot of updates in information technology infrastructure.

The implementation of full electronic payment process is not the only challenge Nigeria is facing. As seen already in Jatau and Dung's study (2014), educational level in country is generally low so proper and adequate teaching and informing of public and banks about the system is needed. Moreover, the system needs to be safe, integrous, reliable, acknowledged and confident (see Sumanjeet, 2009). Banks need to perform under the common platform with uniform account numbers.

It is no doubt that government of Nigeria is getting serious in the fight against corruption. It seems developing countries have to work extra hard as they face a lot of obstacles, such as an implementation of e-payment system in rural areas where delays in payment still exist (see Ogedebe; Babatunde, 2012). Also, real-time financial reporting still has to

be improved, as well as efficiency of the system. Some improvements have been made due to an integration of new technology. Elimination of the cash in public sector meant there was no longer a high risk of possible robbery related with a transport of large sums of money and a number of transactions have been speeded up (see Ogedebe; Babatunde, 2012). While this affected the level of corruption to some extent, in order to start reducing significantly the Nigerian endemic corruption, it is of a great importance to work harder on minimization of the public officials – contractors interaction and improving the speedy payments in all corners of the country.

4 Conclusion

The existing literature about relationship between methods of payment and level of corruption was helpful in capturing the whole picture of how much causality is among these two and there are strong evidence that supports the influence of cash and other ways of payment on the bribing activities, as well as existing corruption having impact on the chosen payment instrument.

Observing an examination of whether the various payment instruments have an influence on the prevalence of corruption, an empirical evidence was found in support of increased paper-based transactions (Goel; Mehrotra, 2012) adding to more corruption and credit card transactions having a negative link with bribing cases. Financial innovations are advised to support a reduction of cash and increase in electronic transactions aside with minimization of the credit and debit card fees that credit companies charge. The role of cash in circulation and large denomination notes in corruption was also investigated (Singh; Bhattacharya, 2017) and analytical approach showed that they can determine illicit activities. A reduction in the supply of high denominations was a plausible suggestion, as their increase resulted in a decline of corruption indices. This could be supported with the ban on cash transactions beyond a certain level (Singh; Bhattacharya, 2017). The reverse causality was found in an impact of high corruption in past on the use of high denominations in present. Another proof of different way of causality is established in a study of corruption (La Rocca; Cambrea; Cariola, 2017) influencing how companies value they cash reserves and how they use them for different basis. Corrupted behavior influences cash being used for bribing activities while in low corrupted nations cash is used to increase business performance.

Scrutinizing the cases in developing nations such as India, Nigeria, Kenya and Tanzania it is noted that the financial innovations in these countries have an impact on reducing petty corruption. The mobile money and wireless pay points introduced as methods of payment for water bills in Tanzania reduced interactions between users and water utility staff (Krolikowski, 2014), making fewer opportunities for bribery and extortion. Furthermore, the decline in petty corruption is certain due to a fact that probability of being caught doing corruptive activities is increased much more in the mobile-enabled payment channel. Demonetization of two highest denomination notes had a positive effect on reducing black money and corruption in India (Tiwari; Khan, 2017). Kenya has one of the most developed mobile phone-based money transfer services that, with strong feedback platform for reporting corruptive cases (Binette, 2016), has a great potential in curbing the massive corruption that affects a number of African nations. An empirical evidence of mobile phone usage and its impact on corruption was also found in a study that included data of Sub-Saharan African countries (Kanyam; Kostandini; Ferreira, 2017). It was noted that an increase in mobile phone subscription causes a decline of corruptive acts. The electronic payment system introduced in Nigeria minimized interactions between government and public and had a negative impact on corruption (Ogedebe; Babatunde, 2012). The cashless economy policy that was implemented serves as an evidence for a right direction in tackling injustice acts that include numerous bribing cases.

Corruption is one of the major problems every economy is facing. It is a constant issue that needs attention, especially in many developing countries that are dealing with it on a bigger scale in a form of political and grand corruption. The financial innovations in the way the payments are done may not completely eliminate exploitation cases related to corruption. However, with the right implementation of mobile technology and electronic-based transactions, it can reduce them. Changing the long tradition of using cash for payments by reducing high denominations and setting limits for cash transactions is needed if the behaviour of corrupted individuals is about to divert.

References

- Aglionby, John (2016). *Corruption in Kenya evolves for a digital age*. Financial Times
- Altunbas, Yener; Thornton, John. (2012). *Does financial development reduce corruption?* Economics Letters 114, 221-223.
- Bardhan, P. (1997). *Corruption and Development: A Review of Issues*. Journal of Economic Literature, 35, 1020-1046.
- Binette, Daniel (2016). *Going cashless to fight corruption: The case of Kenyan public transit*. The Global Anticorruption Blog
- BIS. (1999). *Retail Payments in Selected Countries: A Comparative Study*. Bank for International Settlements, Basel
- Black's Law Dictionary (2014). *What is corruption?* 10th ed. West Group
- Cable News Network (2014). *Banking the unbanked: The mobile money revolution*. Published: November 06, 2014
- Central Bank of Nigeria (2011). *Cashless Lagos Implementation*. CBN Bulletin.
- Chaudhry, Mumtaz Anwar. Shabbir, Ghulam (2007). *Determinants of corruption in developing countries*. HWWI Research Paper, No. 2-11
- Chen, N. (2011). *Securities laws, control of corruption and corporate liquidity: international evidence*. Corporate Governance: An International Review 19 (1), 3-24.
- Davis, J. (2004). *Corruption in public service delivery: Experience from South Asia's water and sanitation sector*. World Development 32(1): 53-71
- Dentons (2013). *Anti-bribery and corruption laws. Comparison of key points in selected jurisdictions*.
- Dimant, Eugen; Tosato, Guglielmo (2017). *Causes and Effects of Corruption: What Has Past Decade's Empirical Research Taught Us? a Survey*. Journal of Economic Surveys
- Dittmar, A.; Mahrt-Smith, J.M.; Servaes, H. (2003). *International corporate governance and corporate cash holdings*. Journal of Financial and Quantitative Analysis 38 (01), 111-133

Doing Business (2014). *Understanding Regulations for Small and Medium-Size Enterprises*. The World Bank

Dreher, A.; Siemers, L.-H.-R. (2009). *The Nexus between Corruption and Capital Account Restrictions*. Public Choice, 140, 245-265.

The Economist (2013). *Why does Kenya lead the world in mobile money?*

Ghosh, T.P. (2017). *Efficacy of Demonetisation in Eliminating Black Money – An Analysis of Indian Demonetisation November 2016*. Journal of Management and Strategy. Vol.8, No.5;

Goel, Rajeev K.; Mehrotra, Aaron N. (2012). *Financial Payment Instruments and Corruption*. Applied Financial Economics, Vol. 22, No. 11, pp.877-886

Goel, R.K.; Nelson, M.A. (2005). *Economic Freedom versus Political Freedom: Cross-Country Influences on Corruption*. Australian Economic Papers, 44, 121-131.

GOI (2012). *White Paper on Black Money*. Ministry of Finance

GOI (2016). *Gazette Notification No 2652*. Dated: November 08, 2016.

The Guardian (2013). *Is Transparency International's measure of corruption still valid?*

Gupta, S.; Davoodi, H.; Alonso-Terme, R. (2002). *Does corruption affect income inequality and poverty?*. Economics of Governance, 3(1), 23-45.

Heywood, Paul (2016). *The Corruption Perceptions Index (CPI): the Good, the Bad and the Ugly*. British Academy

Hough, Dan (2016). *Here's this year's (flawed) Corruption Perception Index. Those flaws are useful*. The Washington Post

Jack, W.; Suri, T. (2011). *The economics of M-Pesa*. NBER Working Paper No.16721. Cambridge, Massachusetts: NBER

Jain, A. (2001). *Corruption: A review*. Journal of Economic Surveys 15(1): 71-121

Jatau, Victoria S.; Dung, Kim L. (2014). *The Central Bank of Nigeria's Cashless Policy: A Major Panacea for Eliminating Corruption and Enhancing Sustainable Development in Nigeria*. An International Multidisciplinary Journal, Ethiopia Vol. 8(4), No.35, 198-206

- Kalcheva, I.; Lins, K.V. (2007). *International evidence on cash holdings and expected managerial agency problems*. Review of Financial Studies 20(4):1087-1112
- Kanyam, Daniel A.; Kostandini, G.; Ferreira, S. (2017). *The Mobile Phone Revolution: Have Mobile Phones and the Internet Reduced Corruption in Sub-Saharan Africa?* World Development Vol.99, pp.271-284
- Kaufmann, D.; Kraay, A.; Mastruzzi, M. (2011). *The Worldwide governance indicators: methodology and analytical issues*. Hague J. Rule Law, 3 (02) pp. 220-246
- Krolikowski, Aaron (2014). *Can Mobile-enabled payment methods reduce petty corruption in urban water provision?* Water Alternatives 7 p.235-255
- La Rocca, Maurizio; Cambrea, Domenico Rocco; Cariola, Alfio (2017). *The role of corruption in shaping the value of holding cash*. Finance Research Letters 20 p.104-108
- Lopez-Claros, Augusto (2014). *What are the Sources of Corruption?* The World Bank
- Mieseigha, Ebipanipre Gabriel; Ogbodo, Uyoyou Kingsley (2013). *An Empirical Analysis of the Benefits of Cashless Economy on Nigeria's Economic Development*. Research Journal of Finance and Accounting ISSN 2222-1697 (Paper) Vol.4, No.17
- The Millenium Challenge Corporation. *Control of Corruption Indicator*.
- Mo, P.H. (2001). *Corruption and Economic Growth*. Journal of Comparative Economics, 29, 66-79
- Myrdal, Gunnar (1968). *Asian Drama: An Inquiry into the Poverty of Nations, Vol.3*. Allen Lane, The Penguin Press.
- Ogedebe, Peter M.; Babatunde, Peter Jacob. (2012). *E-Payment: Prospects and Challenges in Nigerian Public Sector*. International Journal of Modern Engineering Research (IJMER) Vol.2, Issue 5, pp-3104-3106
- The PRS Group. *International Country Risk Guide Methodology*.
- RBI (2017). *Financial Stability Report*. Issue No.15
- Rose-Ackerman, S. (1999). *Corruption and Government*. Cambridge University Press.

Sands, Peter (2016). *Making it harder for the bad guys: the case for eliminating high denomination notes*. Harvard Kennedy School. Mossavar-Rahmani Center for Business and Government

Singh, Sunny Kumar. Bhattacharya, Kaushi (2017). *Does easy availability of cash affect corruption? Evidence from a panel of countries*. Economic Systems 41, p.236-247

Sumanjeet, S. (2009). *Emergence of payment systems in the age of electronic commerce: The state of art*. Global Journal of International Business Research 2(2), 17-36.

Tavares, J. (2003). *Does foreign aid corrupt?* Economics Letters 70. 99-106.

Times of India (2016). *Over 80 percent don't mind inconvenience of demonetisation, says C-Voter poll*. Published: November 23, 2016

Times of India (2017). *97% of scrapped notes deposited with banks as on Dec 30: Report*. Published: January 05, 2017

Tiwari, Devendra Kumar; Khan, Shahwar (2017). *A study on Demonetization and its Impact on Corruption and Black Money*. Saudi Journal of Humanities and Social Sciences

Transparency International (2011). *Corruption Perceptions Index*.

Treisman, D. (2000). *The causes of corruption: a cross-national study*. Journal of Public Economics 76 (3), 399-457

Treisman, D. (2007). *What have we learned about the causes of corruption from ten years of cross-national empirical research?* Annual Review of Political Science. Vol.10: 211-244

Unibul's Money Blog. *Using mobile money to fight corruption and raise salaries in Afghanistan*.

World Bank (2014). *World Development Indicators*.

Zaccaro, S. J.; Bader, P. (2003). *The Plateau State Board of Internal Revenue Statistical Record from 2007- July 2013*.

Abstract

English

This paper examines and scrutinizes the existing work done on the investigating relationship between method of payment that is being used and prevalence of corruption in a country. It captures the publications that acknowledged and empirically investigated the causal link between the financial instrument and corruption widespread presence. The researchers used data from paper and non-paper based transactions as well as a ratio of cash to narrow money. Those were regressed on corruption indices that are being mostly used to measure the extent of corruption nationwide. Analytical evidence shows support of causality in both directions, indicating that cash transactions lead to higher levels of corruption and that existence of numerous bribing cases can result in increased use of high denomination notes as a convenient tool in unlawful activities. Additionally, the studies about new, electronic ways of payment affecting corrupted behaviour showed that financial innovations can help curbing the corruption in a country. For developed nations, it has a potential of being an instrument for reducing information asymmetries between administrative officials and public and increasing transparent payment transactions. Corruption could be adequately addressed with well-implemented policies of setting limits in cash transactions, reducing the supply of large denominations and supporting the integration of mobile technologies in payment channel, such as mobile banking and e-payment.

Abstrakt

Deutsch

Diese Arbeit untersucht den bisher durchgeführten Aufwand in Bezug auf Forschungsbeziehungen im Bereich der Zahlungsmethoden und Korruption eines Landes. Demnach werden Publikationen bereitgestellt, die auf empirische Art und Weise erforscht wurden. Dabei handelt es sich insbesondere um den entscheidenden Bindeglied-Faktor zwischen Finanzinstrument und verbreiteter Korruption. Diese Arbeit stützt sich sowohl auf papiergestützte als auch auf nicht-papiergestützte Transaktionen. Insbesondere gilt dies für das Verhältnis der flüssigen Liquiditätsmittel bis zu einer eng gefassten Geldmenge. Diese sind laut dem Korruptions-Index zurückgegangen und werden vorwiegend für die Korruptions-Messung herangenommen. Analytische Nachweise weisen Unterstützung in Bezug auf die Kausalität beider Richtung auf und zeigen, dass Bargeschäfte zu einer höheren Korruption führen. Abgesehen davon können zahlreiche Bestechungsversuche zu einem Anstieg der Banknoten in rechtswidrigen Situationen führen. Zusätzlich werden auch Studien über neue und vor allem elektronische Zahlungsmethoden präsentiert. Es wurde festgestellt, dass innovative finanzielle Innovationen dabei helfen können, Korruption zu bekämpfen. Für entwickelte Länder bietet sich dies als potenzielles Instrument an um Korruption bekämpfen, indem Informationsasymmetrien zwischen Verwaltungsangestellten und der Öffentlichkeit. Dies bedeutet auch zugleich, dass transparente Zahlungsmethoden in so einem Fall existent sind. Korruption ist grundsätzlich mit adäquaten Strategien leicht zu behandeln, jedoch bedarf es exzellente Richtlinien, die Grenzen in Bezug auf Bargeschäfte, Stückelungen und neue Technologien im Zahlungsmethoden-Bereich wie zum Beispiel Mobile-Banking oder E-Payment festlegen.