THE EFFECTS OF CASHLESS PAYMENTS TOWARDS CORRUPTION IN MALAYSIA, THAILAND AND SINGAPORE

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DECLARATION

We hereby declare that:

(1) This undergraduate FYP is the end result of our own work and that due acknowledgement has been given in the references to ALL sources of information be they printed, electronic, or personal.

(2) No portion of this FYP has been submitted in support of any application for any other degree or qualification of this or any other university, or other institutes of learning.

(3) Equal contribution has been made by each group member in completing the FYP.

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LIST OF ABBREVIATIONS

ADF	Augmented Dickey-Fuller
ARCH	Autoregressive Conditional Heteroscedasticity
BPLM	Breush-Godfrey Serial Correlation LM
CPI	Corruption perspective index
CHEQUE	Cashless payment in cheque
CARD	Cashless payment in card and e-money
DEBIT	Cashless payment in direct debit
DEM	Democracy index
JB	Jarque-Bera Test
GOVT	Covernment size
GDP	Economy growth
OLS	Ordinary Least Square Method
PP	Phillips-Perron
RM	Ringgit Malaysia

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ABSTRACT

Corruption happens due to untraceable financial transactions. Therefore, the purpose of carrying out this study is to find out the relationship between corruption and cashless payment, which can be detected than physical cash transactions in Malaysia, Thailand, and Singapore. Based on the decision, we planned to determine the effect of each type of cashless payment on corruption. The types of instruments are cheques, direct debit, card, and e-money. Besides that, we also implement economic prosperity, government size, democracy, and income inequality as our independent variables. We also presented 10-year data from 2007 to 2017 from Freedom House, WID, World development indicators, and included 3 countries which are Malaysia, Thailand, and Singapore in our research. Firstly, we generate descriptive statistics in this study to review each variable in a separate country for Singapore, Malaysia, and Thailand. Before we start the OLS regression we carry on the Unit Root Test. The test is used to make sure our model is stationary; ADF and PP tests are conducted. We found out that in Singapore, all variable is stationary at second difference while for Malaysia and Thailand variables are stationary at first difference. Then we continue our test in the OLS test and found that in Singapore, GDP and cheque cashless payments have a positive relationship to corruption, while other variables are a negative relationship with corruption.

CHAPTER 1: INTRODUCTION

1.0 Introduction

In this research, we will start with general introduction, which provides the research outline such as research background, problem statement, research objectives and followed by the significance of this study. The objective of this study is to identify the impact of cashless payment on corruption in Malaysia, Singapore, and Thailand countries.

The dependent variable in this research is corruption while the independent variables are known as cashless payment followed by three controlled variable which are economic growth, democracy and government size. Malaysia, Singapore, and Thailand are the top three high fintech countries in ASEAN (Fintech in ASEAN,2018). Therefore, there will be high number of cashless transactions conducted since these countries are known as high top three Fintech countries.

Academically, there is wide range of literatures regarding the effect of cashless payment on corruption that happened in these three countries. According to (Petrou &Thanos,2014) corruption is defined as the abuse usage of power for one's in order to obtain one's private gain. The term of abuse frequently defined as the misuse of illegitimate action for bad purpose.

According to Treisman (2000), he claims that corruption is dishonesty code of conducts that is performed by government officers in order to get some gain or benefits which is against the law and is mostly difficult to manipulate.

For instance, government officials will obtain bribes and provide license and permits to those who offers those benefits in the form of privilege or cash. Bribe is needed in order to initiate an officer work for one who offers the bribes. The purpose to offer one's bribes is to bypass laws and regulations in order to ensure the efficiency of production outcome.

According to Pippidi (2013), he claims that corruption is frequently defined as the deviation from the norm, due to the misuse of authority that are entrusted to promote public interest in fairness and not to promote private gain of any way. There are three different types of corruption which is known as grand corruption, corruption of political and corruption of bureaucratic. Firstly, corruption of grand is centralized as it only involves one party to collect the bribes. Corruption on political and bureaucratic are decentralized because it involves more than one party to collect the bribes.

According to Jain, (2001), the grand corruption is the most detrimental type, as it happens among the politics elite, and this type of corrupted ideas normally originate from the absolute top of the government hierarchy, which the purpose is to balance the interests of the whole society.

This corruption can affect the stability of the country by influencing the people in the country. Also, the grand corruption defines how the politics elite manipulate the economic policies in their country in order to generate a huge advantage or privilege for their sake.

Besides, the grand corruption is known as centralized due to it only involves one party. Bribes on complimentary goods are coordinated. The elite of politics can implement national policies by setting their own preferences so that they can manipulate the resources allocation to obtain the goods from general public to themselves.

Thus, people will collect the governmental goods which is government service and government's subsidies after providing the bribe and there will be no extra request for bribes in the future period for the specific goods. Public spending distributed to the sectors where the largest potential for private income exists for the corrupted elite of political.

So, it will lead to serious impact to a country which is the country's image will influence. In the situation of institutionalized grand corruption, it points out to the performance and the allocation of public procurement contracts by breaking prior rule of explicit and principles of good public procurement to gain a closed network.

Thus, one will able to deny the access to all other and only involves one party to gain the bribes. (Kaufmann & Vincente, 2011; Mungiu-Pippidi, 2006; North, Wallis, & Weingast, 2009; Rothstein & Teorell, 2008).

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They conduct the illegal activities such as kickbacks, bribes collection, and the gain from public funds. The ruling party Chama Cha Mapinduzi (CCM) discovers itself involved in a corruption scandal that was once again lead to significant turbulence in the highest level of the statistics in October 2014. The senior state officials involved in the case of corruption which is alleged illegal payment of 122million U.S. dollar.

They used the guise of energy contracts as reason and paid it to the businessmen. Hence, the 12 donors stop the aid payments to Tanzania until a report into the affair by the controller of general auditor. Besides that, some senior in the ruling party who were involved in this case leave from their parliamentary job.

According to Jain (2001), the corruption of bureaucratic involves two connections while the first one is between the bureaucrats and the elite of political; the second is lower level of corruption as it only shows in the lower level of the public bureaucracy. For the lower level of corruption, the person who is corrupted receives bribes to provide a service or to speed up a bureaucratic process.

Besides that, the officials able to retract the bribes that they have received and to perform the tasks that had been distributed to them by the political group or to carry out the task in which they are not delegated or supposed to do. In the judiciary, bribes can also lower the expenditure or legal penalties faced by an individual.

This will also list in the lower level of corruption. The corruption of bureaucratic is decentralized that the bribes charged does not correspond and involved paying bribe to the bureaucrats to accelerate the procedure of bureaucratic and avoid from legal penalty.

According to Jain (2001), the corruption of political is a type of corruption that affects the behaviour of balloting of a legislator. A person with particular interests or people in group who share the joint interest able to bribe the legislators to support laws that are easier and convenient for them, more beneficial or favourable to seek economic rents related to their activities.

Decentralized corruption will happen in this category because there will be more than one party to collect the bribes might be collecting bribes from more than a party. This situation is also known as “vote-buying” behaviour because the legislators receive or pay bribes or execute other activities of corruption in their effort to be re-elected.

For centuries, corruption is not only common in developed countries such as Europe, it is also known as one of the major problems among Asian countries which includes Malaysia, Singapore, and Thailand. This is because the government tend to sell contracts in order to increase the personal gain from the fastest yet risky approach.

Also, due to the influence of the current trend such as cashless payment and the expansion of trade as well as the reformation of economics, it has provided a loop hole and chances that allows the bureaucrat to take advantages for corruption for personal benefits.

This is also due to the malfunctioning of government institution in developing countries which it contributes loop holes for investment, entrepreneurship as well as innovation. According to Treisman (2000), the research has claimed that there is a negative relationship between corruption and economic growth. It is undeniable that fighting of corruption and transparency has become a part and parcel in terms of every strata of life aspect including social.

Bureaucratic corruption can be claimed as the conduction of corruption that is appointed by bureaucrats or their superiors with the public. It allows the bureaucrats to receive the benefits in terms of cash or privilege Ackerman (2009). The bureaucrat has the resources of power to have the opportunity to exploit if the political elite do not properly control this apparatus. There are three ways of bureaucrat corruption.

In order to compensate the ‘equate supply and demand’, a bureaucrat can undergo corruption by bribing in the market in order to obtain maximum benefits for personal gain. For example, it can create a barrier for other competitor that wants to enter the market in order to monopolise the field of market.

These permits and contracts normally will be awarded to the one who offers the highest bribe and hence it hinders the competition and the fairness of the process is subjected. Besides, another example of bureaucratic corruption is one provide the bribe as incentive payment in order to increase the rate of the productivity. In other words, to make things perform at a faster rate, one will provide offers as incentive to cut the queue of waiting list to ensure the faster pace of the application.

The main cause for bureaucratic corruption is due to the inability of state to pay the government servants with appropriate salary for the labour and the efforts given. Also, it is undeniable that when the bribe levels are high, the probability for fine detection is low, hence the wage that is necessary to eliminate corruption is high.

The purpose of having bureaucratic corruption is to increase personal wealth instead of expanding the scale. Not only that, bureaucratic corruption can cause the inefficient productivity for those whom are not corrupted. In other words, actions such as queue cutting in application waiting list will lead to slow-paced and inefficient productivity for those who are not involved in corruption.

Consequently, it slows down the rate of economic development which caused the state to work inefficiently. It will also lead to confusion and eventually caused dissatisfaction among people in the country which will leads to unstability. By having the culture of bureaucratic corruption, the only incentive to work productively would be the burden for other. This will also cause the insufficient public services as they would refuse to work whole-heartedly after knowing the truth that they are unable to change.

1.1 Research Background

The Association of Southeast Asian Nations (ASEAN) is intergovernmental organization that develops to improve economic growth and stability of region since year 1967. ASEAN consists of 10 member nations which are Indonesia, Malaysia, Philippines, Singapore, Thailand, Brunei, Laos, Myanmar, Cambodia and Vietnam. (Wood, 2017).

In order to help the member state in economics region, ASEAN Economic Community had been built. ASEAN Economic Community (AEC) had been established in 2015, and is the main landmark regional economic combination program, while the AEC proposes the alliance as a single market with demonstrative of goods, services, investments and skilled worker, and independent movement of capital among the region. (Soesastro, 2008)

In this research, three countries of ASEAN will become the sample of studying corruption, which are Thailand, Malaysia and Singapore. According to Kapeli & Mohamed (2019), the authors compare the average ranking of CPI (corruption perspective index) from 11 Southeast Asian countries since 2012 to 2016 while the result showed that Singapore, Malaysia and Thailand are the top three countries in this ranking from least to most corrupt. These three countries are most represented Southeast Asian countries in comparing the corruption cases.

Besides, Thailand, Singapore and Malaysia are chosen since these countries have similar economic patterns and have facing the same demographic changes before. Tan et al (2020). In the paper Tan & et al. (2020), the researchers are testing the effect of monetary and fiscal policies to the growth of countries economic in Malaysia, Singapore and Thailand since 1980 to 2017.

The similar situation of economic, democracy, geography, and culture in Thailand, Singapore and Malaysia show that the comparison between these three countries are reasonable in the corruption level in ASEAN countries. ASEAN countries have serious corruption problem; however, Singapore is the most successful country in Asia in fighting corruption.

According to Quah (2007), Singapore started fighting with corruption with the act Prevention of Corruption Act (POCA) since 1960. People's Action Party (PAP) government had reduced corruption in Singapore by establishing Corrupt Practices Investigation Bureau (CPIB) which can improve the policy in Anti-corruption.

As stated by the researcher Quah (2007), the reasons of corruption in Singapore are low salaries, low risk of detection and punishment as well as ample of opportunities for corruption. Singapore PAP government focus on battle police corruption. Government improve their system of recruitment and selection by enhancing the training and socialize system in police's education. (Quah, 2006)

Thailand is one of the ASEAN country that face serious corruption. According Warsta (2004), many Thailand people agree to pay money as gifts of good will which is called “sin nam jai” to officials and this action is not seen as illegal activity. Thailand had the culture of corruption since that public have low salaries and education especially in low financial gaps society.

The lack of democracy and freedom of word in Thailand normal citizen lead to lack of transparency on government political situation also become the main issue difficult to fight corruption. (Warsta, 2004) Thailand have a special social structure, the Thai King is holding the power to control the political of whole Thailand while this cause the political corruption hard to solve in Thailand. (Dalpino, 1991)

Malaysia also facing corruption problem but not as serious as Thailand. According to the result 2013 CPI (Transparency International, 2013), the result showed Malaysia is not in the comfort zone. Although the transparency of Malaysia is getting improve from year to year, however Malaysia still have long period in fighting corruption issue compared to Singapore. According to Duasa (2008), the result showed that Malaysia Police and Immigration departments have highly possible of corruption.

The survey shows that most of the respondents stated that there are more corruption activities taking place in police and political region. Malaysia also try to battle with corruption and implement more strategies. According to Beh (2017), Malaysia had created Anti-Corruption Agency (ACA) under Anti-Corruption Agency Act 1982 and Prevention of Corruption Act 1961 to promote transparency and aware corrupted activities.

Besides that, Malaysia also implement strategies in education, prevention, and regulation which the strategies had developed by ACA Malaysia. Malaysia failed to solve the corruption in positive outcome of production because Malaysia leaders lack of political will. (Kapeli & Mohamed, 2019)

Figure 1.1 shows the scores of corruption perception across the world in 2019. According to Transparency International (2019), the CPI (Corruption Perceptions Index) currently ranks 180 countries on a scale from 100 (very clean) to 0 (highly corrupt). According to the Figure 1.1, we can see that Malaysia and Thailand were shaded least dark (orange) which means that most of these countries had score lower that 60 over 100. These show that the corruption in Malaysia and Thailand are normal and conceivably become normal in daily life for the citizens (Transparency International, 2019)

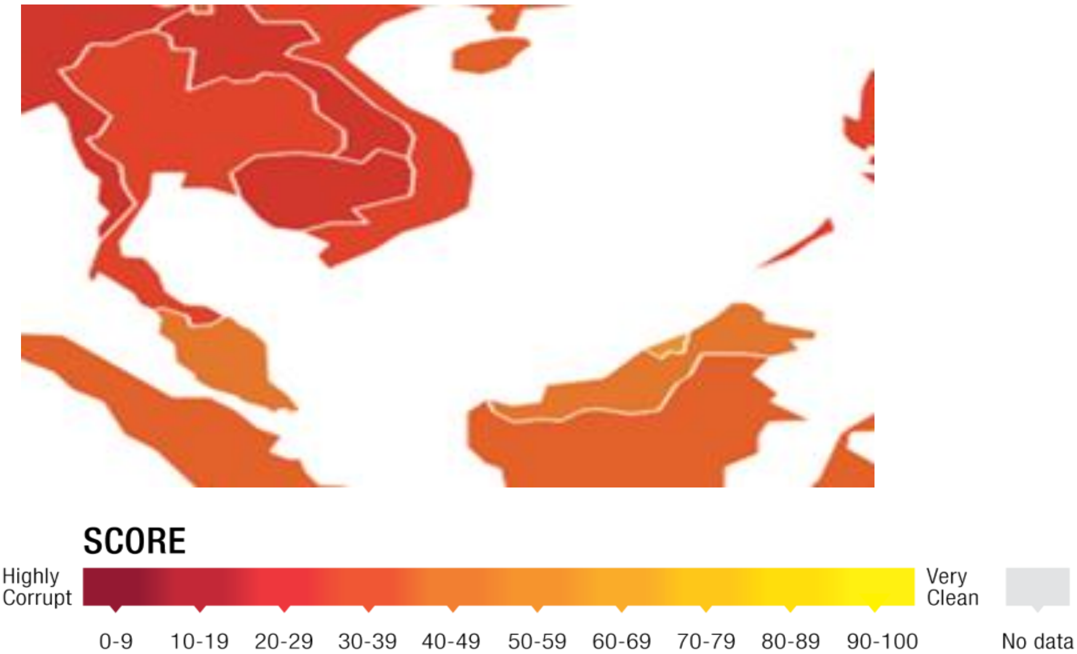

Figure 1.1: Perceived scores of Corruption of Malaysia, Singapore and Thailand 2019

Based on the Table 1.1, we can see that Singapore scores 85 with ranking of 4th, Malaysia scores 53 with ranking of 51th, while Thailand scores 36 with ranking of (Transparency International, 2019). According to CPI ranking list 2019, Singapore and Malaysia are in the top 100 transparency countries rank while Thailand had ranked 101th in fighting corruption, over 180 countries. Singapore had tried their best in fighting against corruption and become the lowest corrupted country compare to Malaysia and Thailand. Besides, Singapore also had higher transparency compare to most of the country in Asia. These means that Singapore acted a good example for Malaysia and Thailand in fighting corruption. (Transparency International, 2019).

Table 1.1 Corruption Perceived Index and Ranking of Malaysia, Singapore and Thailand 2019

	Country	CPI score 2019	Rank
1.	Singapore	85	4
2.	Malaysia	53	51
3.	Thailand	36	101

In year 1997, Asian Economic Crisis strikes in Asia that has given a serious impact to Thailand, Malaysia and Singapore countries and to individuals, this had also highlighted the uncertainty of corruption. Lee & Oh (2007). There is an understanding that global economic has a positive or negative relationship with corruption.

According to Gugiu & Gugiu (2016), EU economic crisis is strongly affecting on corruption while authors show that the economic crisis had hit the country economy with inflation, unemployment and country output. The lower employment rate link to citizens will facing lack of money while this may become a reason why corruption is happening in Asian countries.

According to Jon (2019), the civil servant lack of money was believed as the most widely cited reason that caused corruption, due to insufficient wages it will make a citizen more willing to receive money in a “easier” way. Besides that, the barriers of getting permits and licenses could be another factor for citizens being corrupted. The culture of ASEAN countries is also an issue of corruption in the society.

According to Quah (2019), Asia countries including ASEAN members have the culture related problem to being corrupted. For example: the culture “utang na loob” which means the debt of gratitude in Philippines had made Filipinos more tolerant to the corruption.

In order to reduce the corruption, cashless payment is one of the policies that should be discussed and to be studied on the aspect of anti-corruption. Cashless payment is a financial innovation that are used for any financial transactions without the use of cash, such as mobile payment, credit card, online banking, cheque, demand draft, UPI app and others.

According to Yin (2014), companies such as Alibaba, Tencent, and Grab had rose rapidly through these years by attracting users to perform transactions through mobile payment. Going cashless is an efficient and convenient payment way. These cashless policies help to improve the effectiveness of monetary, control the inflation in economy, maintaining stability of the pricing market.

Implementation of cashless payment can help to reduce cash related problems such as corruption and attract the FDI inflow in a country. Cashless society could make a country easier in monitoring any transaction and could prevent cash-based corruption. Any transaction will be easier to track while this consider to be a good way for a country anti-corruption development. Replacement of cash with cashless credits or electronic funds transfer may decrease corruption, funds laundering, extortion and other deceitful activities that related to cash. (Ajayi, 2014).

On the purpose of reducing corruption, the Transparency International Organization are against corruption and they also cooperate with governments, businesses and public to curb and reduce corruption. (Transparency International, 2019). One of the concepts that had been studied was cashless payment development that will help to control the payment transaction and act as an important role in corrupted countries.

In the recent years, global governments are applying this concept to fight against corruption. (Transparency International, 2019). According to Rochemont (2020), Singapore had joint up projects Jasper and Ubin3 to justify a Blockchain and CBDCs, as a signal of the first meaningful steps to make cross-border payments in order to confirm its safety and convenience in others payment system developments with Canada.

Singapore had started to promote cashless since 1985 with General Interbank Recurring Order (GIRO) and NETS Electronic Fund Transfers at Point of Sale

(EFTPOS), however, the researcher still found that cash is used in 60% of citizen in the research 2016 (Network for Electronic Transfers, 2018).

Besides that, ASEAN countries still need improvement in cashless development. According to Kadar, et al (2019), Thailand, Malaysia and Indonesia are the top three countries that the consumers using cash-based payment in comparing 11 Asia countries. Thailand, Malaysia and Singapore have to refer others regions in fighting corruption, although Nigeria is the most corrupted countries in the world and their government are focusing on policies to minimize black money.

According to Alaeddin et al (2019) Nigeria formed two anti-corruption agencies and also launched the electronic and card payment system to lower down the level of possible corruption in year 2012. According to Uzonwanne and Ezenekwe (2017), cashless money transaction provides effective in closing the leakage and mode of the government correlated transaction in an obvious way.

The uncontrolled situation of Nigeria is a challenge faced by the country due to the main problem where the method that had been suggested had failed. Therefore, cashless payment policy that generate income, payment and transaction between organization and government will become the solution to solve corruption problem. India is a nice reference for other countries, since India is one of the highest cash to gross domestic production ratio (GDP) in the global economy

Their government has started a great quantity policy to promote cashless society, such as Digital Finance for Rural India (Digishala), National Electronic Funds Transfer (NEFT), Bharat Interface for Money (BHIM), Aadhar enabled payment system (AEPS), Point of sale, Lucky Grahak Yojana and the Digi-Vyapar Yojana Hasan& AtifAman (2020).

This study believes that cashless policy is important and government should focus more on this type of policies development. This happened in order for ASEAN countries going cashless so that it will be easier to curb black money and corruption.

Nowadays, the global governments believe that the growth of cashless payment usage will influence the transparency of international.

They consider the cashless society is able to make improvement in anti- corruption. According to Alaeddin, et al (2019), cashless system application is mainly expected to give the benefits in restraining corruption which can resolve a deadlock that face by the current global trend. The use of electronic payments may create a transparency and accountable payment transaction as the tracking of the money flow will become easier. (Alaeddin, et al, 2019).

In Singapore, citizens are more using Credit Card/Debit Card, Apple Pay, Android Pay, Samsung Pay, Paypal, NETS and EZ-Link as their payment method in cashless economy. However, the user of credit card in Singapore become lesser and more switch to other payment methods. (Ng, 2018) According to Ishak(2020), Malaysian like to use E-wallet more than using online banking, mobile banking credit card and debit card while the most E-wallet user in Malaysia like to use the Grabpay compare with other E-wallet.

The cashless payment become more and more familiar since this promoted by Malaysia government while also helps business companies to boost up their sales. In Thailand, Bank of Thailand have to develop the national cashless payment strategy and redesign the domestic banking system (Lamsam, 2018). Thailand is promoting their digital economy in directing of other countries like South Korea and China.

Thailand government set a five-stage national e-payment master plan, which is used to improve the card payment service by developed the Internal Revenue Service (IRS). Thailand also promote e-money and boost public confidence for safety in using digital payment (Kraiwanit, et al. 2019).

1.2Problem Statement

Asian countries face corruption cases in different levels where Malaysia (47%), Thailand (36%) and Singapore (85%). Even though, the percentage does not seem serious. Nevertheless, having the presence of corruption only can lead to high levels of illegal activities, inefficient allocation of resources in terms of education and infrastructure.

For instance, hoarding black money for economic purpose. Therefore, cashless payment was introduced in order to eradicate the level of corruption cases. However, most of the researchers concluded different results for the effects of cashless payment towards corruption which shows that the results are unclear.

This is because, we have come across various statements regarding cashless payment such as cashless policy is not effective and it can only reduce petty corruption which is the lowest level among all forms of corruption.

A study in Lagos stated that 21.2% think that being cashless can cause issues like indiscriminate deductions from accounts and may encounter risky problems in the country such as money laundering, and counterfeit money. On the other hand, 21.8% of people think that being cashless able to reduce cash related corruption.

There were further approaches being made to analyse the impact of cashless payment in countries. However, most of the researchers have encountered problems in countries like Nigeria or Delhi. Even though, there were researchers that have encountered the impact of cashless payment on corruption, but then, the data to analyse the impact for Asian countries seems unclear.

Therefore, in this research, we are focusing on Singapore, Malaysia, and Thailand as the world payment data 2018 represents that Malaysia and Thailand are the nations that show the highest growth of cashless transactions with a growth rate of 25.2% by region for 2016 to the emerging Asia countries. For instance, Malaysia has also started cashless payment policies to encounter corruption. For example, by utilizing Touch n Go e-wallet with bank introducing QR transaction and other facilities.

Not only that, even though there were presence of positive signs of reducing petty corruption in developing countries through the introduction of cashless payment system, its impact on the actual state of corruption in the country remain uncertain.

Overall, this research aims to find out the issue regarding the effects of cashless payment towards corruption in Malaysia, Singapore, and Thailand. It is important to know the effect of cashless payment in reducing corruption to acknowledge whether we have rectified the corruption issue or not. Also, by this, the government or authorities can identify other solutions in eradicating corruption issue.

1.3 Research Objective

1.3.1 General Objective

The general objective of this research is to determine is there any significant relationship between cashless payments and corruption in Thailand, Singapore, and Malaysia. This research also identifies whether the effect of cashless payment impact corruption positively or negatively if in case a relationship does exist between them since there are contradicting views on the matter. To differentiate which type of payment tool will have an effect on corruption and if so, whether it is affecting negatively or positively by considering that each method of cashless payment has different magnitudes of effect on corruption.

1.3.2 Specific Objective

This study examines on:

(i) To determine the impact of cashless payments on corruption in Thailand, Singapore and Malaysia.

(ii) To examine the types of payment tools that will actually have an effect on corruption in Thailand, Singapore and Malaysia.

1.4 Research Questions

There are two research question in this study.

(i)Does cashless payment bring an impact to corruption in Thailand, Singapore and Malaysia.?

(ii)What are types of payment tools that will actually have an effect on corruption in Thailand, Singapore and Malaysia?

1.5 Significance of Study

Theoretically, the outcome of this study will provide a clearer picture of the relationship between cashless payments and corruption in Thailand, Singapore, and Malaysia between the independent variable that have been selected for the study which includes democracy, government size, economic growth, and electronic payments.

This study aims to identify the real significance of these variables and how they give an impact on the corruption in Thailand, Singapore, and Malaysia. The uniqueness in our study is that we will be more specific in studying corruption, with the use of different types of payment tool to see how they react respectively.

Thus, we hope that the results from this research can allow the policymakers and government to understand the variables that may affect corruption that can make it easier to come up with appropriate methods to cope with corruption.

After identifying the relationship between cashless payments and corruption, the government and policymakers will then understand and know whether is it worth putting or invest resources in curbing corruption by going cashless or focus on other ways and variables that may help to reduce corruption.

This research helps the government to choose which method of cashless transactions to focus on to reduce the rate of corruption as this research aims to figure out the magnitude of each method of cashless transactions. Society may also be benefited in the long run by understanding in a clearer picture of the methods of reducing corruption, because corruption may harm a county's wellbeing, so it is vital for the government to reduce corruption constructively as it brings economic benefit towards the country.

Several studies discuss the variables individually that have given the impact on corruption, Johannesson & Steendam(2014) concluded that through mobile banking Kenya's corruption rate has increased.

Besides that, a study by Goh et al. (2019) who had included all the variables and the study was based on European countries. In this research, we aim to have a more in-depth study based on Thailand, Singapore, and Malaysia which include cashless payments.

Moreover, we aim to take into account the previous study result from other countries and compared it with the result we will have in this study to provide more accurate results.

1.6 Chapter Layout

This study consists of introduction**,** this chapter introduces the general background of corruption, problem statement, objective of study, research questions and significant study. The following chapters is the literature review, in this chapter we will discuss and provides a better understanding on the literature review, analysis of relevant theoretical models which contains the discussion and opinions from the previous research. Chapter three will be the methodology, here we will discovers the data collection method, the reasons behind the decision of data chosen, the definition of the variables chosen (dependent & independent variable) as well as the econometric methodologies utilized in this study and in chapter four will be the data analysis and this chapter stand for the empirical results**,** decisions and the analysis of the results which are relevant and answers to the research questions. Lastly this study ends with the conclusion which will clarifies and sum up the important main points of this research which contains summary, policy implementation, limitation, recommendation and also overall conclusion of this study.

CHAPTER 2: LITREATURE REVIEW

2.0 Introduction

In this chapter, different opinions and research will be reviewed based on the previous studies carried out by different researchers about the relationship between the corruption and cashless payment. The controlled variables are economic growth, government size, democracy, and cashless payment. The theory applied in this research is the Technological Acceptance Model (TAM).

2.1 Theoretical Review

2.1.1 Technology Acceptance Model

Cashless payment is often used by individuals to purchase goods and services through electronic payment. Technological Acceptance Model (TAM) can be used to analyze the impacts of cashless payment on a country's economy. The technological Acceptance Model was introduced by Fred Davis in 1993. Hamid et al. (2016).

The theory clarifies how individuals acknowledge new technology and induce growth in the economy. It shows how a user of a proposed innovation invites and adapts to new technology. TAM consists of two elements which are perceived usefulness and perceived ease of use Hamid et al. (2016)

Perceived usefulness means how much an individual accepts that utilizing a particular system would boost his or her job performance. The second element which is perceived ease of use means how much an individual believes that utilizing a particular system would be free of effort. These two elements at a point will influence an individual's mentality toward utilizing the system and further to conduct aim to use the system.

The first element which is perceived usefulness has a positive effect on user acceptance towards electronic payment. The analyzer had summarized that perceived usefulness and it has a positive impact on user acceptance towards electronic payment. Perceived Ease of use is labeled as the quality to which a person or an individual suspect that by utilizing a certain technology would be free of effort. As stated in the Technology Acceptance Model, Perceived Ease of Use has an indirect impact on attitude and behavioral aim to use the technology by the users.

The research has rated three different payment systems in the country of Nigeria by forming a Technological Acceptance Model by using the Perceived Ease of Use by analyzing with other payment systems such as through cash and cheque payment system. Technology Acceptance Model has been generally used to justify the acceptance of cashless payment and mobile financial services.

The e-wallet is a type of digital wallet that concede an individual to connect their debit or credit cards to the e-wallet to generate any transactions. (Karim et al.,2020). Other than the debit or credit cards enables consumers to accumulate their physical card data and bank account number to execute certain actions towards payment.

Payment through e-wallet is considered as one of the most outstanding transaction methods at present because the cashless transaction has the benefit of protection from corruption. (Johannesson,& Steendam, 2014) For example, protection of technology acceptance such as the (QR) code system, the NFC-supported devices (Near Field Communication) is being allocated near to the payment terminal to make the transaction easier.

A study in Kenya constructed Technology Acceptance Model by using the mobile payment system called M-Pesa . the biggest Kenyan mobile telecommunications company launched M-Pesa . M stands for mobile and Pesa is the Swahili word for money). This system function as micro-financing and money transfer service that is created to allow users to get basic banking transactions via their mobile phones rather than a bank. Ntara, C. (2015)

This system has a big potential to substitute cash and reveal the lack of transparency, boost accountability, and reduce corruption. (Johannesson,& Steendam, 2014). By implementing TAM, this model enables to trace the illegal transactions and detect the corrupted money. Therefore, it helps to reduce the chances of corruption activities to happen.

2.2 Independent Variables

2.2.1 Economic Growth

Many pieces of research have studied the determinants of corruption, and many previous surveys have concluded economic prosperity is one of the determinants of corruption. (Treisman, 2000; Gundlach, & Paldam, 2009; Blackburn, Bose, & Haque,2010) has used the cross-country national study to carry out this research. Not only that, previous studies had used the OLS estimated method to test the regression.

According to Treisman (2000), his research argues that economic growth is one of the determinants of corruption. He also explains that the causes of high economic growth lower the corruption level whereas lower economic growth increases the corruption level. This shows, that there is a link between corruption and economic growth.

He also mentioned that the level of corruption will be less in economically developing countries. This clearly shows that economic growth affects corruption. Besides that, the findings reveal, the relationship between corruption and economic growth has a negative relationship.

An investigation was conducted by the previous researcher and confirmed that stimulating economic growth able to reduce corruption. Some theories prove this statement is true. For instance, Weber's argument helps to declare faster economic growth. This reveals economic growth slows down corruption. Treisman (2000).

On the other hand, another researcher also had discovered the evidence that corruption negatively affects economic prosperity. Blackburn, Bose, & Haque (2010) also found out the correlations between growth and corruption are persistently negative and significant.

Mostly, corruption in poor countries is much higher compared to rich countries, this statement has been proved by stating the data which concludes the data is much higher ratings in poor countries than rich countries. This indicates corruption is a vice causing low growth, therefore the determinants of corruption were mainly from the level of economic growth. Ultimately, corruption fades away as the country gets richer. Gundlach & Paldam (2009).

Lastly, according to Serra (2006), spotted that corruption is lesser in richer countries. They also predicted there is a negative strong correlation between economic growth and corruption. Besides, the existence of a negative relationship will not only reduce the economic growth but at the same time may slow down the economic development which will reduce the economic prosperity. Serra (2006).

2.2.2 Government size -

A numerous study has proposed the definition for the public sector. According to(Peter&Heisle,n.d) government is an institution that channels its direction and information to the public by using prominent ways of decision making and hence exercised the state's power every day. In essence, those researchers defined government as a unit, centrally organized decision body that focuses and concentrates more on authorities.

Several studies on government size present a different kind of results. Previous studies have provided mixed results for the relationship between corruption and government size. In the attempt to explain these ambiguous results, Kotera, Okada, Samreth (2012) using GMM estimation had investigated the effect of government size on corruption taking into account the role of democracy.

Their estimation results indicate that an increase in government size decreases corruption if democracy sufficiently penetrates and in contrast, increases corruption if the democracy level is too low. These results are robust, even if it uses a different index of corruption and a different proxy for government size.

Besides that, another study had been done to determine the government size on corruption, Mehrotra and Goel (2011) have found that government size does harm corruption. In other words, if the government size is too large, the corruption level may be lowered. Similarly, their findings are in line with Serra (2006). Another research was done by Billger & Goel (2009) by using OLS regression the result shown that basically government size has a negative relationship among the most corrupt nations, larger governments, and greater economic freedom do not appear to reduce corruption, but greater democracy seems to alleviate it.

On the other hand, by using LIMDEP methodology and panel data set that consists of annual observation for 50 states over the 1983-1987 period Goel and Nelson (1998) found that government size in particular spending by state government does indeed have a strong positive influence on corruption while there is a negative relationship on the size of the federal government.

Further, the contrasting results for the government size variables (by the level of government) provide empirical support for Hungtington's (1968:68) conjecture that there should be greater corruption by officials of subnational governments than at the federal level.

Apart from that, by using the causality test based on two data series (expenditure and corruption) and the sample period from 1996 to 2003. Arvate, et al. (2010), claimed that government size Granger causes corruption and there is no difference in terms of causality between government size and corruption between development (OECD countries excluding Mexico) and developing countries (Latin American Countries).

Besides that, by studying the linkage between government size, corruption and economic growth using the Cobb-Douglas production function of 12 the Middle East and North Africa (MENA) countries throughout 1998-2011, Baklouti &Boujelbene (2016) states that the increasing size of government creates more opportunities for rent-seeking and corruption.

Furthermore, Montinola & Jackman (2002) obtained mixed results concerning the relationship between economic competition and corruption: government size does not systematically affect corruption and did not seem to make the corruption level higher.

2.2.4 Democracy

From several research, mature democracy countries who are well-developed institutions and having an independent media and judiciary relatively have lower level of corruption. However, according to Shleifer &Vishny (1993) and Harris-White and White (1996), the corruption does not drop when the authoritarian countries turn to electoral democracy, the corruption is seen to still increase.

According to Saha, et al (2014), the non-linear democracy-corruption relationship was stating the idea of non-uniformity as the raising level in punishment and detection caused the drops in corruption while this may extent by the comparison of mature democracy and early stage democracy. The transformation stage on limited issues of autocracy is failed to completely removed because of the opportunities of corruption.

Although the result showed that the electoral democracy cannot reduce the corruption, however, the implement of a well-function democracy through a strong rules and regulation is able to control the level of corruption Saha, et al. (2014). The strong implement of rule and regulation in democratically means the probability of catching the criminal of corruption will be higher. Besides, the non-linear democracy-corruption relationship also been finding in other studies.

According to Saha (2008), although there are many corruption cases happened in developed countries, but the integration of modern democratic system will finally result the reducing of corruption level. The political initial conditions and the accomplishment of final democracy define the degree of level in political corruption. (Montinola & Jackman, 2002)

According to Sung (2004), the worldwide show the evidence that the relationship between corruption and democracy is negative. The level of corruption will become low if the countries which have democratic governments. There are many empirical studies are standing by the inverse relationship between democracy and corruption (Sandholtz and Koetzle, 2000; Treisman, 2000; Montinola and Jackman, 2002; Sung, 2004; Bohara et al., 2004).

However, there also have some studies show the different direction impact of democratic on the corruption level. Such as the freedom of speech is able to assist the investigative journalism to deters and discover the public activities of corruption. (Giglioli, 1996; Brunetti &Weder, 2003).

The higher the democracy level, the level of corruption will become lower because of the citizens able to vote the good politicians and prevent from the corrupted politicians. This is because of the high democracy level able to direct the attitude of politicians and the corruption level will be drop. (Boehm, 2015). Yet, in difference direction of views, the high democratic countries may not to avoid the corruption.

This is because the financing campaign of politic raises the risk of corruption since politicians need the cash to implement these campaigns. Consequently, the politicians may corrupt the funds collected from the campaigns. The argument of the democracy can control corruption in effective way when the democracy act as endogeneity which means that no matter the democracies happen or not, the conflict still there among themselves. (Kolstad &Wiig, 2011)

On the other hands, according to Schopf (2011), the hard-data method is able develop to identify the happen of corruption. This method can recognize exchange of rents among organizations with the advantage in spot of rents compare with bribes illegally and corruption. The method was suggested since normally corruptions are not discover to the public, there are some countries which are categories as high-corrupted countries may not be true because the result of perceived corruption level is coming from the survey but not statistical data.

The social media can influence the perceived corruption which are not real in case although the countries are democracy. Hence, under this situation the relationship of democracy and corruption will become positive even though the corruption may not happen.

According to the Felix Goldberg, he mentioned that the scientists of politics still disagree upon a conceptual difference between the corruption and politician. Many researchers separately to think these concepts and differentiate them by their legality. While affecting the decision making of political by corruption is a not legal action yet the lobbyist is a received way to act for the business community interests (Kubbe, I., Engelbert, A., Nov,2017)

2.2.5 Cashless payment

Cashless transaction is the exchange of transaction that without necessarily using physical cash to purchasing goods and services. Nowadays, most of the countries had developed cashless economy, however they just reduced their dependency on cash for their daily funds exchange but still holding cash in their market. The corruption sill happened by using cash in economy market.

Nigeria is the first country that use cashless policy as important policy in facing corruption. According to Anand, Guha, & Goswami (n.d.), the Central Bank of Nigeria (CBN) had developed The Nigerian Model, the new policy on cash-based payment with charge a cash handling charge on day-to-day cash withdrawals and cash deposits to minimize the willing of citizen to using physical cash in economy and stimulate the electronic-based payments. The high cash usage economy cause corruption, leakages and laundering of money among the cash-based activities.

Besides, the policy to minimize corruption is improve the transparency and identifiable of funds transaction flows in traditional view. The cashless transaction contains high degree of transparency and identifiable of money and lead to decrease the level of corruption. (Mehrotra & Goel, 2011). Authors believe that the level of corruption is negatively affected by the cashless policy development since the transparency of money is more occur in cashless transaction.

According Meena (2017), the comparison of India and Sweden show negative relationship between cashless payment and corruption index ranking. Author compare the CPI ranking and the usage of cashless of both countries. From result, we know that India ranked 76th with 22% of people using cashless; while Sweden ranked 3rd in corruption index rank with 89% of people using cashless.

Omotunde, Sunday, & John-Dewole (2013) had studies the effect of cashless policy through survey in Nigeria. According to the result, around 33.3% respondents believe that encourage the payment with cashless can reduce the corruption and attract more investors from other countries. Through the result, authors stated that Nigeria goes cashless produced benefit that modernization of country payment system, decrease cost of banking and also reduce cash related crimes, for example cash-based corrupt activities.

Moreover, the transparency in Eastern Europe that produce when cashless developed in the country play the important role in fighting corruption. (Lazo &Casu,2017) According the research, Moldova is the first country in the world to join World Bank's e-Transformation Initiative and introduced Moldova Governmental e-Payment Gateway (MPay) in year 2013. However, the diffusion of innovation (DOI) is the most problem in promoting cashless towards the citizens.

However, there also have difference sound in studying the cashless implement and corruption. According the survey Ayoola (2013), around 48% of the respondents feel that using cashless policy to fight corruption is not occur in Nigeria. Only 5% and 29% of respondents believed that cashless implement can controlled the corruption in high effective and somewhat effective. In this survey, there are 72% of respondents believe the cashless implement is only bringing limited effect in reducing the corruption.

Author believed the cashless policy and reduction of corruption is occurring but not effective without complementing in E-governance and Transparency and Accountability. According Okoye and Ezejiofor (2013), authors using the ANOVA and chi-square model to make the result that how cashless will affect Nigeria. The result showed that cashless payment policy implement had bring advantages to country in reducing corruption level.

In the research, the author claimed certain reforms that should happened in decrease corruption level. The result occurs that 41.3% of respondents feel that corruption had decrease under the implement of cashless transaction. Authors state that cyber security and illiteracy problem had resolved in Nigeria.

According to Nwoko & Obialor (2019), the study pointed the positive relationship and adverse contributed between technologies of Cashless Policy with restraint corruption in banking, Nigeria payment system innovation, and also reduction of cost in banking service. Besides, the innovation of cashless system had found that include the significant effect on the Nigeria Agricultural Sector Output. The study also found that cashless innovation makes the output of agricultural sector change and affect towards economy growth.

Idowu et al. (2020) had study the relationship of cashless policy and Organizational Performance in in Nigeria. While the result showed that the application cashless policy in National control Centre Osogbo is positive correlation.

Besides, the study also showed that the National control Centre Osogbo corruption and money laundering cashless plans have significant positive correlation. Next the study also gets the result that stated the positive significant impact of Money Laundering and corruption on Organizational Performance (Idowu et al.2020)

2.3 Limitations of the previous studies

Literature review is a vital part of a research as it helps to identify the scope of works that have been done so far in this particular research area. This literature review findings had been used as a foundation for us to build upon our research objective.

The literature gap that we will fill through this study is that we had chosen to examine the effect on the top 3 ASEAN countries which is Malaysia, Thailand and Singapore as this countries had been listed on the top three countries that has the highest usage of cashless payment, so by doing this study we understand does cashless payment plays an important role in combating corruption problem in a country.

There are so many researches that had only focused on corruption in general, but in this study, we will be more specific in studying corruption. For example, we will study the type of payment tool in cashless payment that had been used in this top three countries and how each payment tools reacts to corruption.

Finally, through this we will be able to improve on our understanding of the relationship between these variables and the payment tools with corruption in order to say what works and what does not work for a countr

CHAPTER 3: METHODOLOGY

3.0 Introduction

This chapter we will discuss the methodology on the research created for this study. Furthermore, research design, data processing, samplings design, data analysis, and research framework will be discussed. The theoretical system and hypothesis design will also be formed and will be further explained in this chapter.

The first thing we will test the preliminary analysis. The purpose of this analysis is to examine if the data is stationary or not. Besides that, this analysis is also carried out to inspect the descriptive statistics of the data. A descriptive statistics test is performed to get excessive evidence by determining the mean, median, and standard deviation of data.

Moreover, we also able to detect if the data is normality distributed. Other than that, diagnostic checking will be included to confirm the model does not suffer from any problem. The types of diagnostic involved are normality, heteroscedasticity, autocorrelation, multicollinearity, and model specifications. By utilizing the method, we able to answer the hypothesis specified in the previous chapters. Lastly, the causality between the variables also can be found.

3.1 Research design

Causality is the research design applied in this study. Causality can be utilized when the statements are in the form, “if X, then Y”. This type of study is enforced to measure what effects a specific change will have on the current belief. Most of the researches follows casual explanations that match the test of hypotheses. Overall, causal impact exists when changes in one phenomenon, an independent variable, leads to a change in another phenomenon, the dependent variable. For example, the increase in cashless payment might cause a decrease in corruption level. Kabir (2016). To make causal inferences, three criteria need to be satisfied, which consists of concomitant variation, time order of occurrence of variables, and omit other causal factors.

3.1.1 Concomitant variation

Concomitant variation is known as a cause, X, and an effect, Y, appear together or change together in the way concluded by the hypothesis under consideration. The sign about concomitant variation can be collected qualitatively or quantitatively. This study has the hypothesis of, if the cashless payment increases, the level of corruption decreases. Therefore, in this case, the criteria have been fulfilled.

3.1.2 Time order of occurrence variables

The time order of occurrence situation shows that the causing event must appear before or together with the impact; it cannot appear afterward. By explanation, an impact cannot be formed by an event that occurs after the impact has taken place. It is attainable, but for each event in a relationship to be both the purpose and impact of the study. Overall, the variable can be both purpose and impact in the same causal relationship. For this research, cashless payment happens together with corruption levels. Therefore, the second criteria have been fulfilled.

3.1.3 Eliminating other factors

Other causal possible causal elements absence shows that the element or variable is being researched should be the only attainable causal statement. After an experiment has taken place, we can never assure out all the other causal factors. However, it is possible to take control of some of the causal factors with experimental tools. It is also attainable to balance the impact of some of the uncontrolled variables so that only random changes resulting in these variables will be measured

3.2 Source of data

To discover from a random sample and prevent sampling errors or biases, a random sample should be sufficient size. This is because what is crucial here is not the distribution study population that gets sampled, but the complete size of the sample choose corresponding to the complexity of the population. Taherdoost H. (2017). Moreover, the bigger the sample size the smaller possibility that the discovery will be biased. In short, bigger sample sizes helps to minimize the sampling error. In this research, we able to access the data of 3 out of 10 ASEAN countries which are Malaysia, Thailand, and Singapore. The other 7 countries do not provide cashless payment data. The data in the research is from the year 2007 to 2017; therefore, the data has an observation of 75. However, some data is unavailable in 2018 for Singapore countries. Therefore, the data is unbalanced.

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Variable	Abbreviation	Definition	Expected sign	Sources
Corruption	CPI	Corruption Perception Index	-	Transparency international
Cashless payment	CP	Total value of cashless payment	Negative	Bank of Thailand Basic Payment Indicators World data Atlas
Democracy	DEM	Civil Liberties Political Rights	Negative	Freedom House

Economic growth	GDP	GDP per capita	Negative	World Development indicators
Government size	GOVT	General government final consumption % GDP	Negative	World Development indicators

Table 3.1: Source of Data

3.2.1 Corruption

Corruption is defined as the abuse usage of power for one's to obtain one's private gain. Petrou & Thanos (2014). Corruption Perception Index (CPI) has been broadly utilized to estimate the level of corruption. The reason of using the CPI is because a country's low score also will be shown in the index which totally show as a gathering point for activists. Besides that, it will put high pressure on policymakers in least scoring countries to react. In this study, corruption is the dependent variable for the selected countries. The data utilized in this investigation is the CPI of Malaysia, Thailand and Singapore from year 2007 to 2017.

3.2.2 Cashless Payment

Cashless payment is defining as transactions without holding physical money but preferably with the usage of debit or credit card payment for goods and services. Credit transfer, direct debit, card payment and cheques can be utilized as cashless payment tool. The data used in this study will be the total value of cashless payment from year 2007 to 2017. Cashless payment and the level of corruption has an expected sign of negative.

3.2.3 Government Size

Government size has played an important role in contributing to the economic growth of a nation. Government final expenditure of the percentage in economic growth (GDP) can be used to estimate the size of government. The data utilized for this study is the general government consumption expenditure in three selected countries which are Thailand, Malaysia and Singapore from year 2013 to 2017. Government size with corruption has the negative expected sign.

3.2.4 Democracy

Political rights and civil liberties index are utilized to estimate democracy which is one of the independent variables Sung (2004). The data utilized in the study is Political rights and civil liberties of Malaysia, Thailand and Singapore from year 2013 to 2017. Besides that, the democracy has the expected sign of negative as democracy might help to reduce corruption level by prevent voting for politician that take bribe. Boehm (2015)

3.2.5 Economic Growth

Economic growth is frequently referring to a rise in economic richness, investment and income and employment. Real gross domestic product is the index for economic development. The data utilized in this research will be the real per capita of three selected countries which are Malaysia, Singapore and Thailand from year 2007to 2017. Furthermore, the economic growth has the negative expected sign as the corruption level with economic growth might reduce by increasing the opportunity cost of illegal acts Bardhan (1997).

3.3 Target Population

The objective of this paper is to examine the impact of cashless payment on corruption. Among the 10 Association of Southeast Asian Nations (ASEAN), 3 countries had been chosen which is Malaysia, Singapore and Thailand as the sample of ASEAN countries. As the data is only available for these 3 countries. Aside from that, with more than 600 million people, ASEAN is viewed as an expansion opportunity for companies and among all the ASEAN countries, Singapore has the highest number of smartphone penetration and is also double greater than the next country Thailand. Besides that, Malaysia, Singapore and Thailand are also considered as the largest fintech market among all of the other ASEAN countries. The expected sign for cashless payment is negative, and the other controlled variables like democracy, government size, economic growth are negative as well.

3.4 Model

3.4.1 Multiple Linear Regression Model

Economic Funtion:

Log corruption (CPI)= f [Cheque(CHEQUE),Card and e-money(CARD), Direct debit(DEBIT), Government size(GOVT),Democracy(DEM), Economic Growth (GDP)]

Economic Model in Logarithm Form

logCPI= $\lg CHEQUE_t$

$$\beta_0 + \beta_1 \lg CHEQUE_t + \beta_2 \lg CARD_t + \beta_3 \lg DEBIT_t + \beta_4 \lg GOVT_t + \beta_5 \lg DEM_t + \beta_6 \lg GDP_t + \varepsilon_t \quad (1)$$

Where:

$\lg CPI_t$ = The natural logarithm form of corruption perspective index (CPI) at year t.

= The natural logarithm form of cashless payment in cheque (CHEQUE) at year t.

$\lg CARD_t$ = The natural logarithm form of cashless payment in card and e-money (CARD) at year t.

$\lg DEBIT_t =$ The natural logarithm form of cashless payment in direct debit (DEBIT) at year t.

$\lg GOVT_t =$ The natural logarithm form of government size (GOVT) at year t.

$\lg DEM_t =$ The natural logarithm form of democracy index (DEM) at year t.

$\lg GDP_t =$ The natural logarithm form of economy growth (GDP) at year t.

$\varepsilon_t =$ Error term

3.5 Research Framework

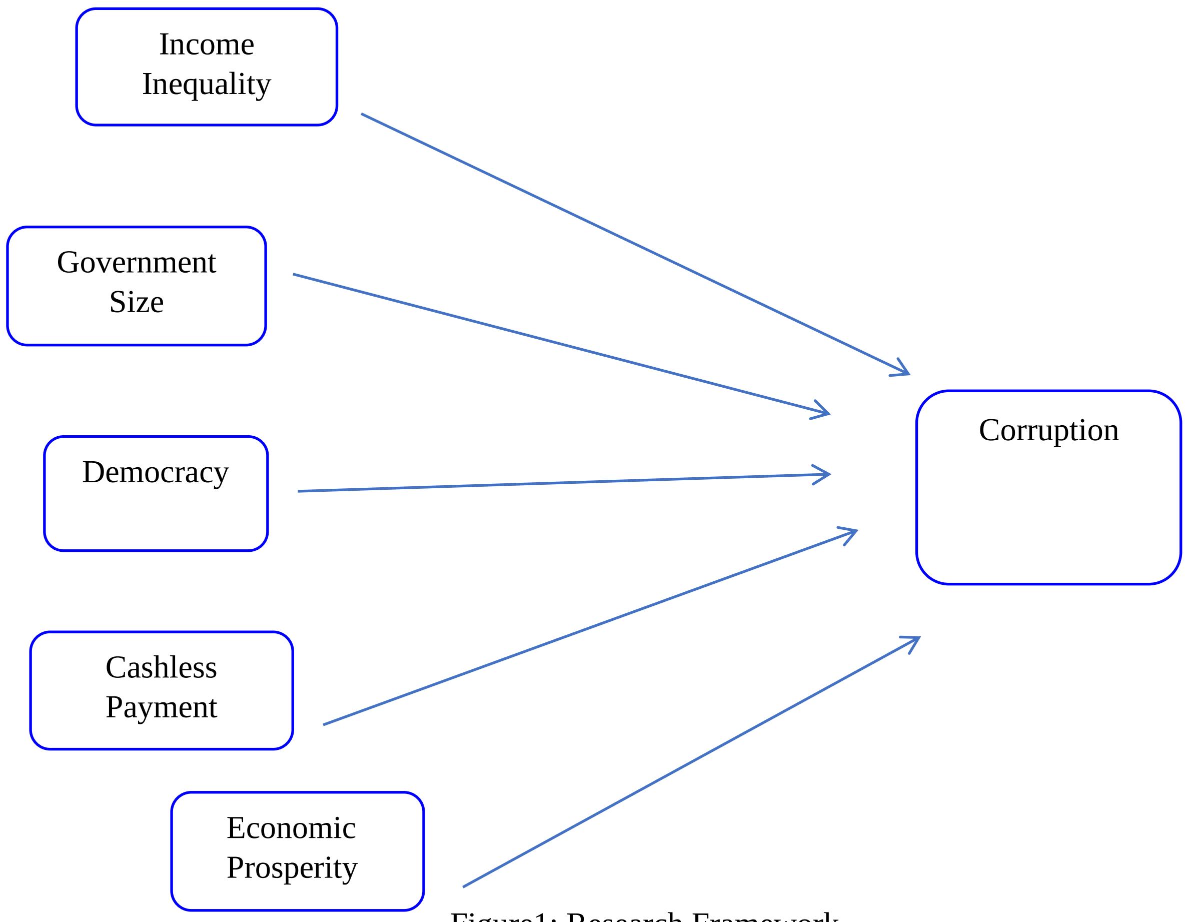
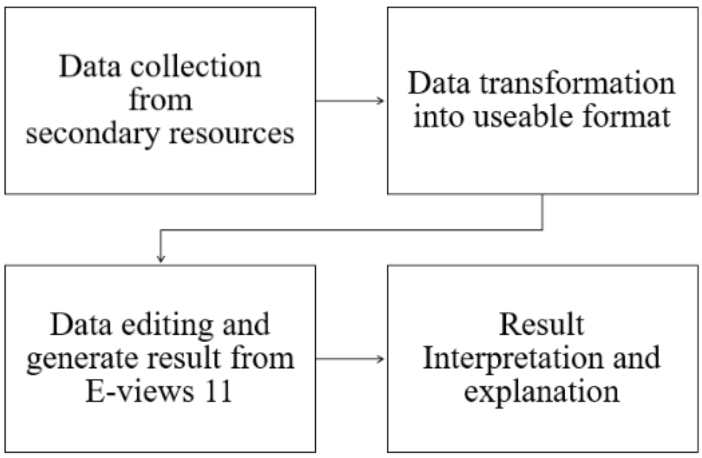


Figure1: Research Framework

The expected relationship between democracy and corruption is negative determining the higher the level of democracy, the corruption tends to be lower (Sung, 2004). Next, economic growth showed an expected negative relationship with corruption, which represent that the higher the level of economic growth the lesser or lower the corruption will be (Treisman, 2002; Billger & Grell, 2009). Lastly, the cashless payment is expected to have a negative relationship with the dependent variable, thus showing that with more individual using cashless payment as the medium of transaction, the corruption level will be lower (Mehrotra & Goel, 20 11; Meana, 2017; Ayoola, 2014)

3.6 Data Processing



Data processing is an important part before estimate and generates the model. Without data processing, we will face the limitation to access and analyze the data collected. The process started with collecting the data from primary or secondary resources. What is the difference between primary and secondary resources?

Primary resources are the data sources that collecting by researchers directly, for example, interviews, surveys, questionnaires, focus groups, etc. (Hox & Boeije, 2005) While secondary data source is the data that already compiled gathered, organized, published, and collected through primary sources, for example, agencies of government, trade association and others (Hox & Boeije, 2005). Primary data collection usually produces more costs and time to get the results while secondary data is more budget in time and cost compare to primary data. In our research, we are using secondary data as our database of model estimation. (Rabianski, 2003)

However, the raw data is not used able for model estimation. Researchers should do the data transformation to choose the useable information and type into the correct format in order the data are easier to describe and analyze. Our research had to transform and combining the data into one Microsoft Excel File for readers to more understanding the data.

Next, we arrange the data and using E-views 11 to run the model estimation. According to Vogelvang (2005), E-views 11 is an important software for economic statistical analysis since it is able to make the user more efficient to control the data, make econometric analysis, generate forecasts and produce graphs and tables.

Furthermore, the processing of data will be continuing by interpretation and explanation of the E-views 11 results. The E-views 11 producing the result statistically but not in the general explanation in words. Therefore, the researchers should produce the interpretation to make readers understand the results. These explanations are the most important part of data processing because not all readers will understand the result generated.

3.7 Data Analysis

3.7.1 Descriptive Analysis

Firstly, we will test the data is by conducting descriptive statistics. These findings involve the mean which is the average value and the median which is also known as the middle value. Besides that, the maximum and minimum value of the time series also can be specified. The distribution of the time series can be estimated through the standard deviation. The descriptive statistics also demonstrate the skewness which estimates the symmetry of the series. Not only that, but the skewness also determines if the series is right-tailed or left tailed.

3.7.2 Unit Root Test

The unit root test is an instrument that assists to examine if a data is stationary. Stationary is a procedure where the statistical property of a variable does not vary every time. Stationarity is one of the crucial assumptions when generating a time series analysis. If a process that inevitable for stationary series but tested with non-stationary series, the data will be wrong and the t-test will be invalid which leads to misleading conclusions. Nason (2006).

The model for unit root is given as below:

$$Yt - Yt{-}1 = \beta Yt{-}1 - Yt{-}1 + \varepsilon t$$

$$\Delta Yt = \beta Yt{-}1 - Yt{-}1 + \varepsilon t$$

$$\Delta Yt = (\beta - 1)Yt{-}1 + \varepsilon t$$

$$\Delta Yt = \gamma Yt{-}1 + \varepsilon t$$

It can be clarified:

If β =1 is classified as unit root, it clearly shows that β =1 is non-stationary. If β < 1, then there is no unit root which means it is stationary. If β >1, means that it is non stationary and explosive process. The model is assumed by $\Delta Yt = \gamma Yt{-}1 + \beta 1 \Delta Yt{-}1 + \cdots + \beta k \Delta Yt{-}k + \varepsilon t$.

In order to run the unit root test, two types of tests will be conducted in our analysis. The first type of test is acknowledged as the Augmented Dickey Fuller test (ADF)test.

This test is brought in by Dickey and Fuller (1981). The test examines the serial correlation problem of the data.

The second type of test is known as The Philip Perron test. This test is the complete version unit root test in addition the test also includes automatic correction which enables for auto correlated residuals. Both of this test includes the time trend and intercept. When a time series data does not have a time trend, this will indicate the data are nonstationary.

The null hypothesis carry out for both of the tests are H0: $\beta = 1$, Yt is not stationary and has a unit root and the alternative hypothesis would be be H0: $\beta < 1$, Yt is stationary and does not have a unit root.

If the p-value is larger than the significant level of 0.01,0.05 and 0.10, the null hypothesis cannot be rejected which shows the series is nonstationary. Otherwise, the null hypothesis can be rejected and concludes the series is stationary.

When the data is rejected at stationary, the test can be generated by using first differencing or second differencing Once the data already achieve first or second differences for both of the test, the results will be stationary.

Jarque bera

$$= \frac{N}{6} S^2 + \frac{k-3}{4}$$

3.7.3 Ordinary Least Square

In order to examine for short term relationship, the p-values for the coefficients are crucial. The null hypothesis would be the variables have no significant relationship. If the p-value is less than 0.05, thus the null hypothesis will be rejected. Otherwise, we do not reject the null hypothesis.

$H_{0\,=}$ There is no effect in cashless payment towards corruption

$H_{1=}$ There is effect in cashless payment towards corruption

3.7.4 Diagnostic Checking

Normality

We can examine the normality distribution by utilizing the Jarque-Bera (1987) test. By running the normality test we can certify that outliers are not involved in the analysis sample. The removal of these outliers can decrease the possibilities of error by generating the normality test Osborne& Waters (2002). Besides that, this test helps to enhance the precision of the estimates.

Jarque bera

$$= \frac{N}{6} S^2 + \frac{k-3}{4}$$

The Jarque – Bera (1987) is also known as the Lagrange Multiplier test which helps to indicate that it has maximum local asymptotic power. Hence, it is one of the best tests for normality. The Jarque -Bera test estimates the variance in the skewness and kurtosis of the series related to the normal distribution.

The Jarque -Bera test statistics can be linked with chi-square distribution which has 2 degrees of freedom. This checking utilizes the null hypothesis that would be $H0$ is normal distribution, where skewness is zero and excess kurtosis.

The alternative hypothesis is $H1$ is non-normal distribution. If the p-value of the variable is bigger than 0.05 significance level, the null hypothesis cannot be rejected. Thus, this concludes the time series is normally distributed. Otherwise, the null hypothesis can be rejected.

Autocorrelation

Autocorrelation or also identified as serial correlation is a condition when the assumption for independence among the error term is violated. The similarity between the time series data and a lagged version or a future value of itself will occur. Autocorrelation is stated as a correlation ordered either in time or space between the series. The classic assumptions are the error term for anyone observation is not applicable to the error term of any other observation.

If clarified figuratively, no autocorrelation would be $E(uiuj) = 0 \; i \neq j$

The occurrence of autocorrelation will complicate the testing. This is because the number of independent observations will be decreased. Besides that, the existence of autocorrelation also makes the models less efficient.

Hence, we need to perform this checking in order to prevent from autocorrelation problem. To examine this problem, the Breusch-Godfrey Serial Correlation LM Test is utilized in this research.

This test is an alternative diagnostic checking to the Durbin Watson test. The Durbin Watson test contains an area of inconclusiveness that causes the findings less useful. Breusch-Godfrey has the potential to show accurate findings on the error term if it could be correlated over more than just one period. This test is more suitable because it is robust to this inclusion of the lagged dependent variable.

Given that,

$$ut = \rho 1ut{-}1 + \rho 2ut{-}2 + \cdots + \rho qut{-}q + \varepsilon t$$

The null hypothesis is specified by, $H0$: $\rho1 = \rho2 = \cdots = \rho q = 0$. This illustrates that the lagged error term has no impact on the error term and concludes there is no autocorrelation. The alternative hypothesis is assumed by, $H1$: at least one is $\neq 0$, which indicates that autocorrelation problem arises.

The LM test statistics is given by:

$$LM = nR\ 2 \approx X1\ 2\ LM * = n - k\ m\ R\ 2\ 1 - R2 \approx F(m, n - k)$$

The decision rule comes from linking the Chi-square value and the significance level. If Chi-square is larger than 0.01, we do not reject $H0$. This shows that there is no autocorrelation problem. Otherwise, $H0$ will be rejected. If there is autocorrelation problem, we will run the Newey West Test to treat it.

Heteroscedasticity

Heteroscedasticity is the condition where the error terms does not have constant variance. Heteroscedasticity as the irregular spread. If heteroscedasticity happens, it would cause biased and misleading parameter estimates. Biased standard errors will cause inaccurate conclusions on the significance of the coefficients of the model. Minor heteroscedasticity will only obtain small impact on the significance of the test.

Nevertheless, it can cause the findings to have serious misrepresentations if the problem occurs. Berry and Feldman (1985). The Autoregressive Conditional Heteroscedasticity (ARCH test) is used to detect a heteroscedasticity problem in the model. ARCH test is a form of LM test that is able to identify the significance of the ARCH effects.

The model for the ARCH test is given by: $Ha : et\ 2 = \alpha0 + \alpha1et{-}1\ 2 + \cdots + \alpha mem{-}1\ 2 + u$

The null hypothesis is given by: $H0 = \alpha0 = \alpha1 = \cdots = \alpha m = 0$ The null hypothesis shows that there is no heteroscedasticity. If the p-value of the F test is more than 0.01, we do not reject $H0$. Otherwise $H0$, will be rejected. In a situation that $H0$ is rejected, we will treat heteroscedasticity by applying White Test.

Multicollinearity

Multicollinearity happens when independent variables have a high inter-correlation among each other. In other words, it occurs when two or more variables are highly correlated with each other. Multicollinearity could take place when a variable is computed from other variables in the same data set. It could also occur when two variables have similar characteristics.

One way of identifying multicollinearity in the model is when the model has high R2 but low significance in the parameter. This would result in biased estimates and incorrect signs leading to inaccurate results (Kmenta, 1986).

The confidence intervals would become wide and the values of the statistics would be small. It would become difficult to reject the null hypothesis and would cause biased results. To test the existence of multicollinearity in our model we would be using the variance inflation factor (VIF hereafter) to see how much the variance is inflated. There would be an inflation of variance of the estimated coefficients if multicollinearity exists in the model.

The Rk 2 is the value of R2 that we find when we regress the predictor k against all the remaining predictors. Each predictor has its own individual value for VIF. We run the pairwise correlation coefficient analysis between the independent variables to test for multicollinearity.

Hair et al. (1995) said that if the Variance Inflation Factor (VIF) is less than 10, there is no serious collinearity problem. Any VIF that is more than 10 would show serious collinearity issues in the model. Otherwise we would conclude that the variables didn’t show multicollinearity problem and the model would pass the diagnostic checking. According to Gujarati and Porter (2009), the easiest way to solve the problem of multicollinearity would be to eliminate the problematic variable.

Model Specification

A mistake in a model currently is misspecified would mean that the current model that is being used is incorrect. There are a few types of model misspecification that could arise. There could be an inclusion of unnecessary variables, deletion of importation variable or using the wrong functional form. Some of the other reasons that misspecification could happen is because of data problem. There could be missing data, outliers and non-random sampling of data. Model specification can be tested using the Ramsay (1969).

RESET test. $yi = \beta 1 + \beta 2xi2 + \beta 3xi3 + \gamma 1\hat{yi}\ 2 + \gamma 2i\hat{yi}\ 3 + \gamma 3\hat{yi}\ 4 + u$

The null hypothesis is $\gamma 1 = \gamma 2i = \gamma 3 = 0$. The alternative hypothesis being, either one is equal to 1. The rejection of the null hypothesis would display that one of the other variables have effect on the model. In other words, the null hypothesis would show that the model is fittingly specified.

The alternative hypothesis shows that the model is not correctly specified. If the p-value is less than 0.05, the null hypothesis is rejected. This would show that there is error specification.

Otherwise the null hypothesis cannot be rejected. If there is model misspecification, the RESET test doesn't give clear instructions on what should be done next. However, if there is misspecification, we will add new variables or drop unnecessary ones. We would also attempt different functional forms to see which functional form works greatest

CHAPTER 4: DATA ANALYSIS

4.1 Ordinary Least Square Method

lgCPI= $\beta_0 + \beta_1 \lg CHEQUE_t + \beta_2 \lg CARD_t + \beta_3 \lg DEBIT_t + \beta_4 \lg GOVT_t$
$+ \beta_5 \lg DEM_t + \beta_6 \lg GDP_t + \varepsilon_t$ (1)

Where:

$\lg CPI_t =$	The natural logarithm form of corruption perspective index (CPI) at year t.
$\lg CHEQUE_t =$	The natural logarithm form of cashless payment in cheque (CHEQUE) at year t.
$\lg CARD_t =$	The natural logarithm form of cashless payment in card and e-money (CARD) at year t.
$\lg DEBIT_t =$	The natural logarithm form of cashless payment in direct debit (DEBIT) at year t.
$\lg GOVT_t =$	The natural logarithm form of government size (GOVT) at year t.
$\lg DEM_t =$	The natural logarithm form of democracy index (DEM) at year t.
$\lg GDP_t =$	The natural logarithm form of economy growth (GDP) at year t.
$\varepsilon_t =$	Error term

4.1.1 Singapore Model OLS

$$\text{lgCPI}= 4.651555 - 0.048081\lg CHEQUE_t - 0.259035\lg CARD_t - 0.08989\lg DEBIT_t + 0.103029\lg GOVT_t - 0.602686\lg DEM_t + 0.316363\lg GDP_t + \varepsilon_t \quad (2)$$

Standard error = (1.935958) (0.187182) (0.163000) (0.096054)

(0.176900) (0.276458) (0.219825)

P-value = (0.0741) (0.8100) (0.2013) (0.4023)

(0.5915) (0.0947) (0.2235)

Table 4.1.1 E-view Result of Singapore Model

Independent Variable	Actual Sign	Coefficient	P-value
$\lg CHEQUE$	Negative	0.048081	0.8100
$\lg CARD$	Negative	-0.259035	0.2013
$\lg DEBIT$	Negative	-0.08989	0.4023
$\lg GOVT$	Positive	0.103029	0.5915
$\lg DEM$	Negative	-0.602686	0.0947
$\lg GDP$	Positive	0.316363	0.2235

R-square= 0.961229	Adjusted R-square=0.903071

R-squared is used to measure the proportion of dependent variable can explain by using the independent variables in regression model. According to Table 4.1.1, the E-view Result showed that Singapore model dependent variable lgCPI and be 96.12% explained by the independent variables above.

While this is highly closed to completely explained. While Adjusted R-square had used to explain the degree to which predictor variables justify the variation of real variables. Singapore Model had 90.31% adjusted R-square and state that the predicted variables is closely justified to real variables.

Besides, the result in Table 4.1.1 also showed the actual sign of independent variable towards dependent variable. The three cashless payment methods are all negative relationship towards the corruption, the higher the cashless payment the lower the corruption index in Singapore.

The democracy index showed the negative relationship towards corruption perspective index in Singapore model. While for government size and economy growth, there showed the positive relationship with corruption perspective index. The higher the Singapore government size and economy growth, the higher the corruption perspective index in Singapore.

4.1.2 T-Test

H_0: There is no significant relationship between the independent and dependent variable ($(\beta_i = 0, i = 1,2,3,...t)$

H_1: There is a significant relationship between the independent and dependent variable ($(\beta_i = 0, i = 1,2,3,...t)$

Decision Rule: Reject H_0 if probability value is lower than significant level. Otherwise, does not reject H_0.

Table 4.1.2 Result of T-tests

Independent Variable	Significant Level, α	P-value	Decision Making	Conclusion
$\lg CHEQUE$	0.05	0.8100	Do not Reject H_0	Insignificant
$\lg CARD$	0.05	0.2013	Do not Reject H_0	Insignificant
$\lg DEBIT$	0.05	0.4023	Do not Reject H_0	Insignificant
$\lg GOVT$	0.05	0.5915	Do not Reject H_0	Insignificant
$\lg DEM$	0.05	0.0947	Do not Reject H_0	Insignificant
$\lg GDP$	0.05	0.2235	Do not Reject H_0	Insignificant

From Table 4.1.2, all the independent variables are insignificant affecting Singapore corruption. The three cashless payment methods: cheque, card &e-money and direct debit cannot significantly determine Singapore corruption perspective index. While for government size, democracy index and economy growth also show the insignificant in rejected the H0.

4.1.3 F-Test

H_0: The overall model is insignificant

H_1: The overall model is significant

Decision Rule: Reject H_0 if probability value is lower than significant level. Otherwise, does not reject H_0.

Table 4.1.3 Result F-test

Significant Level, α	**P-value**	**Decision Making**	**Conclusion**
0.05	0.008560	Reject H_0	Significant

The F-test is used to check and analyze the overall significance of the model. As the result showed in Table 4.1.3, the probability is less than 0.05 significant level, therefore reject the H0 and this showed that the significant in overall model. The model is important to explain Singapore corruption.

4.2.1 Malaysia Model OLS

lgCPI= $4.738575 + 0.004551 \lg CHEQUE_t - 0.662785 \lg CARD_t + 0.235854 \lg DEBIT_t + 0.262754 \lg GOVT_t - 0.136381 \lg DEM_t + 0.479619 \lg GDP_t + \varepsilon_t$ (2)

Standard error = (2.853951) (0.014779) (0.161773) (0.057759)

(0.481465) (0.852183) (0.169231)

P-value = (0.1723) (0.7735) (0.0149) (0.0151)

(0.6143) (0.8806) (0.0471)

Table 4.2.1 E-view Result of Malaysia Model

Independent Variable	**Actual Sign**	**Coefficient**	**P-value**
$\lg CHEQUE$	Positive	0.004551	0.7735
$\lg CARD$	Negative	-0.662785	0.0149
$\lg DEBIT$	Positive	0.235854	0.0151
$\lg GOVT$	Positive	0.262754	0.6143
$\lg DEM$	Negative	-0.136381	0.8806
$\lg GDP$	Positive	0.479619	0.0471

R-square= 0.857294	Adjusted R-square= 0.643235

According to Table 4.2.1, the E-view Result showed that Malaysia model dependent variable lgCPI and be 85.73% explained by the independent variables above. While this is closed to completely justified. While Adjusted R-square had explained 64.32% that the predicted variables is justified to real variables.

Next, the result in Table 4.2.1 showed the actual sign of independent variable towards dependent variable. The cashless payment methods in cheque and direct debit are positive relationship towards the corruption while for card & e-money is negative impact to corruption.

The democracy index showed the negative relationship towards corruption perspective index in Malaysia model. While for government size and economy growth, there showed the positive relationship with corruption perspective index. The higher the Malaysia government size and economy growth, the higher the corruption perspective index in Malaysia.

4.2.2 T-Test

H_0: There is no significant relationship between the independent and dependent variable ($(\beta_i = 0, i = 1,2,3,...t)$

H_1: There is a significant relationship between the independent and dependent variable ($(\beta_i = 0, i = 1,2,3,...t)$

Decision Rule: Reject H_0 if probability value is lower than significant level. Otherwise, does not reject H_0.

Table 4.2.2 Result of T-tests

Independent Variable	**Significant Level, α**	**P-value**	**Decision Making**	**Conclusion**
$\lg CHEQUE$	0.05	0.7735	Do not Reject H_0	Insignificant
$\lg CARD$	0.05	0.0149	Reject H_0	Significant
$\lg DEBIT$	0.05	0.0151	Reject H_0	Significant
$\lg GOVT$	0.05	0.6143	Do not Reject H_0	Insignificant
$\lg DEM$	0.05	0.8806	Do not Reject H_0	Insignificant
$\lg GDP$	0.05	0.0471	Reject H_0	Significant

From Table 4.2.2, Malaysia economy growth have sufficient evidence in signification determine the Malaysia corruption perspective index. Cashless payment in card & e-money and direct debit are significant in determine the dependent variable, corruption perspective index Malaysia. Cheque cashless payment, government size and economy growth in Malaysia model cannot significantly determine the corruption.

4.2.3 F-Test

H_0: The overall model is insignificant

H_1: The overall model is significant

Decision Rule: Reject H_0 if probability value is lower than significant level. Otherwise, does not reject H_0.

Table 4.2.3 Result F-test

Significant Level, α	**P-value**	**Decision Making**	**Conclusion**
0.05	0.100185	Do not reject H_0	Insignificant

As result showed above Table 4.2.3, Malaysia model is not significant. This because of the p-value is larger than significant level 0.05 while this state that the overall model cannot explained Malaysia corruption perspective index.

4.3.1 Thailand Model OLS

$$\text{lgCPI} = -0.104063 + 0.122195\lg CHEQUE_t + 0.200062\lg CARD_t - 0.03796\lg DEBIT_t + 0.246484\lg GOVT_t - 0.050167\lg DEM_t + 0.228512\lg GDP_t + \varepsilon_t \quad (2)$$

Standard error = (3.064282) (0.346543) (0.064263) (0.122921)

(0.408006) (0.300201) (0.450938)

P-value = (0.9745) (0.7422) (0.7705) (0.7729)

(0.5784) (0.8754) (0.6390)

Table 4.3.1 E-view Result of Thailand Model

Independent Variable	Actual Sign	Coefficient	P-value
$\lg CHEQUE$	Positive	0.122195	0.7422
$\lg CARD$	Positive	0.200062	0.7705
$\lg DEBIT$	Negative	-0.03796	0.7729
$\lg GOVT$	Positive	0.246484	0.5784
$\lg DEM$	Negative	-0.050167	0.8754
$\lg GDP$	Positive	0.228512	0.6390

R-square= 0.572225	Adjusted R-square= -0.069438

According to Table 4.3.1, the E-view Result showed that Thailand model independent variables can be 57.22% explained the dependent variable. While Adjusted R-square had explained -6.94%, stated that the predicted variables cannot use to justified the variation of variables.

Next, the result in Table 4.3.1 showed the actual sign of independent variable towards dependent variable. The cashless payment methods in cheque and card & e-money are positive relationship towards the corruption. Only direct debit showed the negative impact towards corruption perspective index in Thailand. The democracy index showed the negative relationship towards corruption perspective index in Thailand model. While for government size and economy growth, there showed the positive relationship with corruption perspective index. The higher the Thailand government size and economy growth, the higher the corruption perspective index in Thailand.

4.3.2 T-Test

H_0: There is no significant relationship between the independent and dependent variable ($(\beta_i = 0, i = 1,2,3,...t)$

H_1: There is a significant relationship between the independent and dependent variable ($(\beta_i = 0, i = 1,2,3,...t)$

Decision Rule: Reject H_0 if probability value is lower than significant level. Otherwise, does not reject H_0.

Table 4.3.2 Result of T-tests

Independent Variable	**Significant Level, α**	**P-value**	**Decision Making**	**Conclusion**
$\lg CHEQUE$	0.05	0.7422	Do not Reject H_0	Insignificant
$\lg CARD$	0.05	0.7705	Do not Reject H_0	Insignificant
$\lg DEBIT$	0.05	0.7729	Do not Reject H_0	Insignificant
$\lg GOVT$	0.05	0.5784	Do not Reject H_0	Insignificant
$\lg DEM$	0.05	0.8754	Do not Reject H_0	Insignificant
$\lg GDP$	0.05	0.6390	Do not Reject H_0	Insignificant

From Table 4.1.2, all the independent variables are insignificant affecting Thailand corruption. The three cashless payment methods: cheque, card &e-money and direct debit cannot significantly determine Thailand corruption perspective index. While for government size, democracy index and economy growth also show the insignificant in rejected the H0.

4.3.3 F-Test

H_0: The overall model is insignificant

H_1: The overall model is significant

Decision Rule: Reject H_0 if probability value is lower than significant level. Otherwise, does not reject H_0.

Table 4.3.3 Result F-test

Significant Level, α	**P-value**	**Decision Making**	**Conclusion**
0.05	0.572173	Do not reject H_0	Insignificant

According the result Table 4.3.3, the high probability value of Thailand model had showed that the overall model did not significant to determine Thailand corruption. Thailand model had less evidence to say that the model can explained the corruption in Thailand.

Our dependent variable in this research is the corruption which is CPI, and the independent variable are average income, GDP per capita, democracy, government size, and three instrument cashless payment which is direct debit, cheque, card and e-money. According to thee table of descriptive statistic, the mean of the CPI is 0.1%. The minimum CPI in these periods is -4.51%, the maximum is 4.43%.

The mean of average income is 2.40%. The minimum is -6.92% and the maximum is 2.086%. The GDP per capita ‘s mean is 0.61%. The lowest is -10.15%%, the highest is 22.09%. The mean of democracy is 1.24%, the lower is 0.00%, the higher is 11.12%. The mean of government size is 0.09%. The highest is 9.53%, the lowest is -4.81%. The mean of direct debit is 7.98%, the lowest is 2.06% and the highest is

24.54%. The mean of cheque is 4.74%. The highest is 12.56%, the lowest is -7.69%. Lastly, the mean of card and e-money payment is 6.81%, the highest is 13.27%, the lowest is 0.69%. Standard deviation estimates the variation between the mean and the number in a set of data.

A standard deviation which is low show that the data point is tented to be close to the data set's mean, and vice versa. From the descriptive statistic, the standard deviation of corruption perspective index is 0.0291, card and e-money payment is 0.0386, direct debit is 0.06570, cheque is 006299, GDP per capita is 0.0947, average income is 0.0768, democracy is 0.0370, and government size is 0.0468.

	LCPI	LCPE	LCPD	LCPC	LGDP	LAI	LDPR	LGOV
Mean	-0.0046	0.0986	0.1019	-0.0096	0.0211	0.0275	-0.006	0.0063
Maximum	0.1536	0.1592	10.507	3.4235	0.2148	0.0945	0.0513	0.1259
Minimum	-0.1251	0.0714	0.2303	-3.471	-0.1502	-0.1333	-0.0541	-0.0406
Std. Deviation	0.0992	0.0273	0.2365	1.7247	0.1148	0.0652	0.0313	0.0562

Table 4.1.2: Descriptive Statistic of Malaysia

According to thee Table 4.1.2 of descriptive statistic, the mean of the CPI is -0.46%. The minimum CPI in these periods is -12.51%, the largest is 15.36%.

The mean of card and e-money payment is 9.86%. The minimum is 7.14% and the maximum is 15.92%. The direct debit payment 's mean is 10.19% . The lowest is 23.03%%, the highest is 1050.7%. The mean of cheque cashless payment is -0.96%, the lower is -347.1%, the higher value is 342.35%. The mean of GDP is 2.11%. The highest is21.48%, the lowest is -15.02%.

The mean of average income is 2.75%, the lowest is -13.33% and the highest is 9.45%. The mean of democracy is -0.6%. The highest is 5.13%, the lowest is -5.4%. Lastly, the mean of government size is 0.63%, the highest is 12.59%, the lowest is -4.06%. Standard deviation estimates the variation between the mean and the number in a set of data.

A standard deviation which is low show that the data point is tented to be close to the data set's mean, and vice versa. From the descriptive statistic, the standard deviation of corruption perspective index is 0.0992, card and e-money payment are 0.0273 direct debit is 0.2365, cheque is 1.7247, GDP per capita is 0.1148, average income is 0.0652, democracy is 0.0313, and government size is 0.0562.

	LCPI	LCPE	LCPD	LCPC	LGDP	LAI	LDPR	LGOV
Mean	0.0062	-0.0835	-0.0125	-0.0156	-0.0003	0.0022	-0.077	-0.0072
Maximum	0.0846	0.2437	0.3160	0.1675	0.2252	0.0818	0.879	0.0787
Minimum	-0.0822	-1.6575	-0.4457	-0.2136	-0.1362	-0.0389	-1.011	-0.1194
Std. Deviation	0.0602	0.5937	0.250	0.1134	0.1095	0.0363	0.5694	0.0547

Table 4.1.3: Descriptive Statistic of Thailand

The Table 4.1.3 above, the mean of the CPI is 0.62%. The minimum CPI in these periods is -8.22%, the largest is 8.46%.. The mean of average income is 0.22%. The minimum is -3.89% and the maximum is 8.18%. The mean of card and e-money payment is -8.35%, the highest is 24.37%, the lowest is -165.75%. The mean of democracy is -7.7%, the lower is -101.1%, the higher is 87.9%.

The mean of government size is -0.72%. The highest is 7.87%, the lowest is -11.94%. The mean of direct debit is -1.25%, the lowest is -21.36% and the highest is 16.75%. The mean of cheque is -1.56%. The highest is 16.75%, the lowest is -21.36%. Lastly, the GDP per capita 's mean is -0.03% .

The lowest is -13.62%%, the highest is 22.52%. Standard deviation estimate the variation between the mean and the number in a set of data. A standard deviation which is low show that the data point is tented to be close to the data set's mean, and vice versa. From the descriptive statistic, the standard deviation of corruption perspective index is 0.0602, card and e-money payment is 0.5937, direct debit is 0.25, cheque is 0.1134, GDP per capita is 0.1095, average income is 0.0363, democracy is 0.5694, and government size is 0.0547.

4.4 Diagnostic Checking

4.4.1 Multicollinearity

Multicollinearity means that the model has high degree of correlation between independent variables that used to estimate the dependent variable. While the high degree of correlation between independent variables will cause the less reliable statistical inferences. In this research, two methods had used to examine the multicollinearity problem in the three models.

Method 1: High R-square but less significant t-ratios

Based on the Table 4.1.1, Singapore model had the R-square= 0.961229 which consider high, means that 96.12% of variation in dependent variable can be explained by total variation of independent variables. Next, the Table 4.1.1 also stated that p-value of all independent variable are larger than significant level 5%. While this means that independent variables in Singapore model may have serious multicollinearity problem.

Based on the Table 4.2.1, Malaysia model had the R-square= 0.857294 which consider high, means that 85.73% of variation in dependent variable can be explained by total variation of independent variables. Next, the Table 4.2.1 also stated that p-value of cheque cashless payment, government size and democracy index of Malaysia are larger than significant level 5%. While this means that the independent variables cheque cashless payment, government size and democracy index may have multicollinearity problem. However, the table also showed that cashless payment in card & e-money, direct debit and economy growth in Malaysia are significant since lower p-value than α=0.05 and means that these variables may avoid from serious multicollinearity problem.

Based on the Table 4.3.1, Thailand model had the R-square= 0.5722 which consider moderate, means that 57.22% of variation in dependent variable can be explained by total variation of independent variables. Next, the Table 4.3.1 also stated that p-value of all independent variable are larger than significant level 5%. Thailand model did not have multicollinearity problem since the R-square is not consider high.

Method 2: High pair-wise correlation coefficient

Table 4.4.1a. Pair-Wise Correlation Coefficient of Singapore

	$\lg CPI$	$\lg CHEQUE$	$\lg CARD$	$\lg DEBIT$	$\lg GOVT$	$\lg DEM$	$\lg GDP$
$\lg CPI$	1	-0.3343	-0.9179	-0.9079	-0.3645	-0.5595	-0.8323

$\lg CHEQUE$	-0.3343	1	0.3602	0.4465	-0.4719	0.5594	0.5900
$\lg CARD$	-0.9179	0.3602	1	0.9797	0.3562	0.3428	0.9487
$\lg DEBIT$	-0.9079	0.4465	0.9797	1	0.2819	0.3656	0.9588
$\lg GOVT$	-0.3645	-0.4719	0.3562	0.2819	1	-0.1604	0.09288
$\lg DEM$	-0.5595	0.5594	0.3428	0.3656	-0.1604	1	0.4002
$\lg GDP$	-0.8323	0.5900	0.9487	0.9588	0.09288	0.4002	1

According to Table 4.4.1a, it found that cashless payment in direct debit and card & e-money is highly correlated. Besides, cashless payment in card & e-money and economic growth in Singapore have highly correlated while cashless payment in direct debit and economic growth in Singapore also highly correlated. Democracy index and cheque cashless payment had moderate correlated, then there is also moderate correlated between the cheque cashless payment and economic growth in Singapore.

Table 4.4.1b. Pair-Wise Correlation Coefficient of Malaysia

	$\lg CPI$	$\lg CHEQUE$	$\lg CARD$	$\lg DEBIT$	$\lg GOVT$	$\lg DEM$	$\lg GDP$
$\lg CPI$	1	-0.1764	0.0788	0.3677	-0.1457	-0.3446	0.1423
$\lg CHEQUE$	-0.1764	1	-0.1256	-0.1060	-0.3333	0.0340	-0.2674
$\lg CARD$	0.0788	-0.1256	1	0.9014	0.4356	-0.6178	0.7827
$\lg DEBIT$	0.3677	-0.1060	0.9014	1	0.1524	-0.7873	0.5575
$\lg GOVT$	-0.1457	-0.3333	0.4356	0.1524	1	0.3202	0.6370

lg*DEM*	-0.3446	0.0340	-0.6178	-0.7873	0.3202	1	-0.2786
lg*GDP*	0.1423	-0.2674	0.7827	0.5575	0.6370	-0.2786	1

According to Table 4.4.1b, it found that cashless payment in direct debit and card & e-money is highly correlated. Besides, cashless payment in card & e-money and economic growth in Malaysia have moderate highly correlated while cashless payment in direct debit and economic growth in Malaysia also moderately correlated.

<u>Table 4.4.1c Pair-Wise Correlation Coefficient of Thailand</u>

	lg*CPI*	lg*CHEQUE*	lg*CARD*	lg*DEBIT*	lg*GOVT*	lg*DEM*	lg*GDP*
lg*CPI*	1	0.5184	-0.3272	0.6404	0.6570	-0.4084	0.6948
lg*CHEQUE*	0.5184	1	0.0498	0.5247	0.3315	-0.2468	0.5077
lg*CARD*	-0.3272	0.0498	1	-0.3878	-0.5610	0.0992	-0.6573
lg*DEBIT*	0.6404	0.5247	-0.3878	1	0.7396	-0.7890	0.9053
lg*GOVT*	0.6570	0.3315	-0.5610	0.7396	1	-0.4764	0.8090
lg*DEM*	-0.4084	-0.2468	0.0992	-0.7890	-0.4764	1	-0.5688
lg*GDP*	0.6948	0.5077	-0.6573	0.9053	0.8090	-0.5688	1

According to Table 4.4.1c, it found that there is highly correlated between cashless payment in direct debit with economic growth in Thailand and government size in Thailand with economic growth in Thailand. Besides, cashless payment in direct debit and government size have moderate highly correlated. There are moderately correlated between cashless payment in direct debit with cashless payment in cheque and economic growth in Thailand with cashless payment in cheque.

4.4.2 Heteroskedasticity

Heteroscedasticity problem is one of the statistically problem when standard errors of a variable inconsistency and the monitored over a specific amount of time no constant. To test the model heteroscedasticity problem, the Autoregressive Conditional Heteroscedasticity (ARCH) test is used.

Decision Rule: Reject H_0 if probability value is lower than significant level. Otherwise, does not reject H_0.

<u>Table 4.4.2 Autoregressive Conditional Heteroscedasticity (ARCH) Test</u>

Autoregressive Conditional Heteroscedasticity (ARCH) Test			
Model	**P-value**	**α**	**Conclusion**
Singapore	0.9518	0.05	Do not reject H_0. No heteroscedasticity problem.
Malaysia	0.7194	0.05	Do not reject H_0. No heteroscedasticity problem.
Thailand	0.4919	0.05	Do not reject H_0. No heteroscedasticity problem.

To test the model heteroscedasticity problem, the Autoregressive Conditional Heteroscedasticity (ARCH) test is used. In this diagnostic check, the null hypothesis shows that there is no heteroscedasticity. If the p-value of the F test is more than 10% significant, then not reject the H_0. The result indicates that Singapore model, Malaysia model and Thailand model is no heteroscedasticity problem.

4.4.3 Autocorrelation

Autocorrelation is one of the problems happened when current variable value and its past values are correlated and also used to measure the degree of similarity in the time series. In this research, Breusch-Godfrey Serial Correlation LM Test is use to estimate the autocorrelation problem.

Decision Rule: Reject H_0 if probability value is lower than significant level. Otherwise, does not reject H_0.

Table 4.4.3 Breush-Godfrey Serial Correlation LM Test

Breush-Godfrey Serial Correlation LM Test			
Model	**P-value**	**α**	**Conclusion**
Singapore	0.1430	0.05	Do not reject H_0. No autocorrelation problem
Malaysia	0.6340	0.05	Do not reject H_0. No autocorrelation problem
Thailand	0.1447	0.05	Do not reject H_0. No autocorrelation problem

The Breusch-Godfrey Serial Correlation LM Test is use to estimate the autocorrelation problem. In this test, the null hypothesis H_0 show that is no autocorrelation and the alternative hypothesis is given by, H_1 indicate the autocorrelation occurs. The result show that Singapore model, Malaysia model and Thailand model had no autocorrelation problem.

4.4.4 Model Specification

Model specification is important measurement for checking the model specification error that happened if the equation used the independent variables that poorly represent relevant to the true data. In this research, the Ramsey RESET test is used to test the specification of the model.

H_0: The model is correctly specified

H_1: The model does not correctly specified

Decision Rule: Reject H_0 if probability value is lower than significant level. Otherwise, does not reject H_0.

Table 4.4.4 Ramsey Regression Equation Specification Error Test (RESET) Test

Ramsey Regression Equation Specification Error Test (RESET) Test			
Model	**P-value**	**α**	**Conclusion**
Singapore	0.6536	0.05	Do not reject H_0. Model correctly specified.
Malaysia	0.1038	0.05	Do not reject H_0. Model correctly specified.
Thailand	0.8277	0.05	Do not reject H_0. Model correctly specified.

Ramsey RESET test is used to test the specification of the model. In this test, the null hypothesis H_0 show that is correctly specified and means that is no omitted variable and the alternative hypothesis is given by, H_1 is represent that model is no correctly specified while indicate the specification problem occurs in model. The results indicate that Singapore, Thailand and Malaysia model were no reject H0 in Ramsey RESET test. This means that Singapore, Thailand and Malaysia model are bias in specification and correctly specified model.

4.4.5 Normality Test

The normal distribution is one of the most common type of model distribution and is motivated in model contribution. In this research, Jarque-Bera is use to test normality of the distribution.

H_0: Error term are normally distributed

H_1: Error term does not normally distributed

Decision Rule: Reject H_0 if probability value is lower than significant level. Otherwise, does not reject H_0.

Table 4.4.5 Jarque-Bera Test

Jarque-Bera Test			
Model	**P-value**	**α**	**Conclusion**
Singapore	0.5437	0.05	Do not reject H_0. Model normally distribution.
Malaysia	0.8267	0.05	Do not reject H_0. Model normally distribution.
Thailand	0.6778	0.05	Do not reject H_0. Model normally distribution.

The Jarque-Bera is use to test normality of the distribution. This test concern that null hypothesis H_0 is normal distribution; while alternative hypothesis is H_1 is non normal distribution. According the result, the p-value larger than 5% significant so do not reject H_0 and this indicate that all model is normally distributed. From the Table 4.4.5, the result showed that Singapore, Malaysia and Thailand models are all normally distribution since the p-value is larger than 0.05 significant level. All the model does not reject the H_0 in this normality test.

Table 4.5.1 Unit Root Test Singapore in Level

In level	ADF		PP	
	Constant	Constant with trend	Constant	Constant with trend
Variables				
LCPI	-0.690354(0)	-1.739955(0)	-0.690354(0)	-1.810199(1)
LCHEQUE	-1.715019(0)	-1.933402(1)	-1.715019(0)	-1.768396(0)
LCARD	-3.210159(0)	0.858991(1)	-4.664078(4)***	2.208439(9)
LDEBIT	-0.438146(0)	-1.851621(1)	-0.207042(8)	-1.994917(0)
LDEM	-1.874312(0)	-2.765632(1)	-1.899604(2)	-1.822488(3)
LGOV	-2.010796(0)	-1.984739(0)	-2.105068(1)	-2.086600(1)
LGDP	-1.050100(0)	-1.860299(1)	-1.177728(7)	-1.344365(2)

Notes: ( ) means the number of lag. *, **, and *** are representing the significant level at 10 percent, 5 percent, and 1 percent, respectively.

H_0: There is unit root in variable.

H_1: There is no unit root in variable.

In table 4.5.1 above, we show the result of both ADF test and PP test result in level form. According to table, all variables of Singapore have testing the unit root in with trend and constant after tested by ADF and PP test. The result showed that Singapore card and e-money payment are stationary at level with trend and constant for ADF in 5%, and 10% significant and PP test in all 1%, 5%, and 10% significant. However, other variables are no stationary with trend and constant for both ADF and PP test. In order to achieve stationary status for all variables in Singapore at all significant levels. Therefore, we continued ADF test and PP test with first difference.

Table 4.5.2 Unit Root Test Singapore in 1st Difference Level

First difference	ADF		PP	
	Constant	Constant with trend	Constant	Constant with trend
Variables				
LCPI	-2.634260(0)	-2.426119(0)	-2.6342560(0)	-2.426119(0)
LCHEQUE	-2.695449(0)	-2.591547(0)	-2.700802(2)	-3.769728(6)*
LCARD	-0.003482(1)	-4.885130(1)	-2.1608591(1)	-3.976871(2)*
LDEBIT	-3.401495(1)**	-13.92805(1)***	- 0.207042(8)**	- 1.994917(0)**
LDEM	-2.645751(0)	-2.457437(0)	-2.960073(5)*	-2.571126(5)
LGOV	-3.747618(0)**	-3.747618(0)**	- 3.725629(1)**	- 4.543499(3)**
LGDP	-2.200328(0)	-4.442406(1)**	- 2.127592(3)**	2.402503(8)

Notes: ( ) means the number of lag. *, **, and *** are representing the significant level at 10 percent, 5 percent, and 1 percent, respectively.

H_0: There is unit root in variable.

H_1: There is no unit root in variable.

Table 4.5.2 above shows the unit root test result in first difference for Singapore variables. According to the result, lgCPI and lgCHEQUE not stationary at first differencing with trend and constant for both ADF and PP test in all 1% 5%, and 10% significant. lgCARD and lgDEM not stationary in ADF but stationary in PP. Therefore, we can continue Second difference in order to make sure all variable are non-unit roots.

Table 4.5.3 Unit Root Test Singapore in 2nd Difference Level

Second difference	ADF		PP	
	Constant	Constant with trend	Constant	Constant with trend
Variables				
LCPI	-4.137915(0)**	-3.851975(0)*	-5.4312784(4)	-7.233055(7)***
LCHEQUE	-3.505313(0)**	-3.403166(0)	-3.564690(2)	-3.452050(2)
LCARD	-4.309245(1)**	-4.5762285(1)**	-6.340551(1)	-11.99440(5)***
LDEBIT	-	-	-	-
LDEM	-3.680708(0)**	3.451712(0)	-5.450355(7)	-5.930980(7)***
LGOV	-	-	-	-
LGDP	-4.704225(1)	-4.875797(1)**	-3.216642(4)	-2.893881(3)

Notes: ( ) means the number of lag. *, **, and *** are representing the significant level at 10 percent, 5 percent, and 1 percent, respectively.

H_0: There is unit root in variable.

H_1: There is no unit root in variable.

Table 4.5.3 above shows the unit root test result in second difference for all Singapore variables. According to the result, LCHEQUE amd LGDP are not stationary in PP. Exclude there two variable, all bariable is stationary at second difference with trend and constant for both ADF and PP test in all 5%, and 10% significant. Now all variables do not have unit root at all significant levels which are 1%, 5% and 10% for ADF and PP test exclude LCHEQUE and LGDP no signifinal in PP test.

Table 4.5.4 Unit Root Test Thailand in Level

In level	ADF		PP	
	Constant	Constant with trend	Constant	Constant with trend
Variables				
LCPI	-1.292117(1)	-4.139329(0)**	-2.747582(1)	-4.987194(4)**
LCHEQUE	-2.036548(0)	-3.802533(1)	-1.898864(5)	-1.487316(7)
LCARD	-1.927041(0)	-1.644250(0)	-2.040535(9)	-1.085446(7)
LDEBIT	-0.109241(0)	-4.104043(1)**	0.612854(9)	-4.573334(9)**
LDEM	-0.807386(0)	-2.005437(0)	-0.807386(0)	-1.915100(2)
LGOV	-2.806435(0)	-1.280052(0)	-4.539091(4)***	-0.494572(4)
LGDP	-1.400623(0)	-1.625017(0)	-2.197016(5)	-1.633698(1)

Notes: ( ) means the number of lag. *, **, and *** are representing the significant level at 10 percent, 5 percent, and 1 percent, respectively.

H_0: There is unit root in variable.

H_1: There is no unit root in variable.

In Table 4.5.4, we show the result of both ADF test and PP test result in level form. According to table, all variables of Thailand have testing the unit root in with trend and constant after tested by ADF and PP test. The result showed that Thailand CPI and LCHEQUE, LCARD, LDEM, LGDP are not stationary at level with trend and constant for ADF and PP test at 5%, and 10% significant. Thailand LGOV only stationary in level constant of PP test at all 1%, 5%, and 10% significant. Next, LDEBIT of Thailand only stationary with trend at5% and 10% significant level for both ADF and PP test.In order to achieve stationary status for all variables in Thailand at all significant levels. Therefore, we continued ADF test and PP test with first difference.

TABLE 4.5.5 Unit Root Test Thailand in 1st Difference Level

First difference	ADF		PP	
	Constant	Constant with trend	Constant	Constant with trend
Variables				
LCPI	-6.155930(0)***	-5.761894(0)***	-9.120351(5)***	-9.385965(5)***
LCHEQUE	-5.274257(1)***	-7.126125(1)***	-3.023038(5)	-2.650678(5)
LCARD	-3.048547(0)**	-3.817244(1)*	-3.068478(2)*	-5.735581(8)***
LDEBIT	-2.854407(0)*	-2.572374(0)	-3.670457(8)**	-2.730753(8)
LDEM	-3.471418(0)**	-2.726272(1)	-3.792498(5)**	-6.712791(8)***
LGOV	-2.351112(0)	-4.200957(0)**	-	-
LGDP	-3.042397(0)*	-2.869078(0)	-3.042397(0)**	-2.860456(3)

Notes: ( ) means the number of lag. *, **, and *** are representing the significant level at 10 percent, 5 percent, and 1 percent, respectively.

H_0: There is unit root in variable.

H_1: There is no unit root in variable.

Table 4.5.5 shows the unit root test result in first difference for all variables. According to the result, There only Thailand variables LCHEQUE are not stationary in PP test in all 5%, and 10% significant. From table, the results show that all variables do not have unit root at all significant levels which results show that all variables do not have unit root at all significant levels which are 10% and 5% for PP test except the LCHEQUE. In order to achieve stationary status for all variables in Singapore at all significant levels. Therefore, we continued ADF test and PP test with first difference.

TABLE 4.5.6 Unit Root Test Thailand in 2nd Difference Level

Second difference	ADF		PP	
	Constant	Constant with trend	Constant	Constant with trend
Variables				
LCPI	-	-		
LCHEQUE	-	-	-3.859759(7)**	-4.510973(7)**
LCARD				
LDEBIT	-3.327539(0)**	-3.036573(0)		
LDEM	-2.530366(1)	-4.342721(0)**		

LGOV	-	-		
LGDP	-5.104020(0)***	-4.644347(0)**		

Notes: ( ) means the number of lag. *, **, and *** are representing the significant level at 10 percent, 5 percent, and 1 percent, respectively.

H_0: There is unit root in variable.

H_1: There is no unit root in variable.

Table 4.5.6 shows the unit root test result in first difference for all variables. According to the result, the LDEBIT, LDEM, LGOV, LGDP are significant in ADF test. The LCHEQUE is siginificant in PP test.

Table 4.5.7 Unit Root Test Malaysia in Level

In level	ADF		PP	
	Constant	Constant with trend	Constant	Constant with trend
Variables				
LCPI	-1.711290(0)	-2.595613(1)	-1.783324(1)	-1.771230(1)
LCHEQUE	-3.354912(0)**	-3.161232(0)	-3.486687(3)**	-3.428746(4)
LCARD	-2.092593(1)	-2.150967(0)*	-6.589936(9)***	-3.634195(9)*
LDEBIT	0.838177(0)	-3.225146(1)	0.575744(1)	-2.576503(9)
LDEM	0.269216(1)	-2.727684(1)	-1.105104(1)	-1.852735(0)
LGOV	-1.862661(0)	-0.875115(1)	-1.840963(1)	-0.934184(0)
LGDP	-1.991861(0)	-1.614683(0)	-2.451799(5)	-1.544004(2)

Notes: ( ) means the number of lag. *, **, and *** are representing the significant level at 10 percent, 5 percent, and 1 percent, respectively.

H_0: There is unit root in variable.

H_1: There is no unit root in variable.

Fro m table 4.5.7, we show the result of both ADF test and PP test result in level form. According to table, all variables of Malaysia have estimating the unit root in with trend and constant after tested by ADF and PP test. The result showed that

Malaysia LGDP, LCPI, LDEBIT, LDEM, LGDP are not stationary at level with trend and constant for ADF and PP test in 5%, and 10% significant. The LCHEQUE and LCARD is stationary at level with trend and constant for ADF and PP test in 5%, and 10% significant. In order to achieve stationary status for all variables in Singapore at all significant levels. Therefore, we continued ADF test and PP test with first difference.

Table 4.5.8 Unit Root Test Malaysia in 1st Difference Level

First difference	ADF		PP	
	Constant	Constant with trend	Constant	Constant with trend
Variables				
LCPI	-2.460714(0)	-2.302446(0)	-2.465014(1)	-2.324740(1)
LCHEQUE	-4.666228(0)**	-4.364485(0)**	-8.960724(8)***	-9.238580(8)***
LCARD	-3.663909(0)**	-4.449183(0)**	-3.663909(0)**	-6.705309(5)***
LDEBIT	-1.677658(0)	-2.139909(1)	-1.387249(8)	-1.475408(5)
LDEM	-5.218459(0)***	-10.08035(0)***	-4.535862(2)*	-10.22992(1)***
LGOV	-2.928226(0)*	-7.687249(0)***	-2.935684(1)*	-17.35408(6)***
LGDP	-3.626476(0)**	-4.226391(1)**	-3.559616(1)**	-4.879089(5)**

Notes: ( ) means the number of lag. *, **, and *** are representing the significant level at 10 percent, 5 percent, and 1 percent, respectively.

H_0: There is unit root in variable.

H_1: There is no unit root in variable.

From table 4.5.8, we show the result of both ADF test and PP test result in 1st difference level form. According to table, all variables of Malaysia have estimating the unit root in with trend and constant after tested by ADF and PP test. The result showed that Malaysia all variable is significant in both ADF and PP test except the LDEBIT not significant n both ADF and PP test. Therefore, we continued ADF test and PP test with second difference.

Table 4.5.9 Unit Root Test Malaysia 2nd Difference in Level

Second difference	ADF		PP	
	Constant	Constant with trend	Constant	Constant with trend
Variables				
LCPI	-5.467083(0)***	-6.020970(0)***	-5.048319(1)***	-11.90626(6)***
LCHEQUE	-	-	-	-
LCARD	-	-	-	-
LDEBIT	-3.408580(1)**	-6.749036(1)**	-3.083068(7)*	-3.378479(7)
LDEM	-	-	-	-
LGOV	-	-	-	-
LGDP	-	-	-	-

Notes: ( ) means the number of lag. *, **, and *** are representing the significant level at 10 percent, 5 percent, and 1 percent, respectively.

H_0: There is unit root in variable.

H_1: There is no unit root in variable.

Fro m table 4.5.9, we show the result of both ADF test and PP test result in 2nd difference level form. According to table, all variables of Malaysia have estimating the unit root in with trend and constant after tested by ADF and PP test. The result showed that Malaysia LCPI and LDEBIT variable is significant in both ADF and PP test .

Anova test

Singapore

Test for Equality of Means Between Series
Date: 08/31/20 Time: 23:56
Sample: 1 11
Included observations: 11

Method	df	Value	Probability
Anova F-test	(7, 70)	2.341924	0.0330
Welch F-test*	(7, 29.66)	3.396695	0.0087

According the table above, the Singapore regression had a significant level of 0.033 which is smaller than 0.05. The result makes the regression equation more sufficiently proved the relationship of dependent variable.

Malaysia

Test for Equality of Means Between Series
Date: 09/01/20 Time: 02:14
Sample: 1 11
Included observations: 11

Method	df	Value	Probability
Anova F-test	(7, 70)	0.039712	0.9999
Welch F-test*	(7, 28.92)	8.531349	0.0000

According the table above, the regression had a significant level of 0.999 which is larger than 0.05. The result makes the regression equation no sufficiently proved the relationship of dependent variable.

Thailand

Test for Equality of Means Between Series
Date: 09/01/20 Time: 11:41
Sample: 1 11
Included observations: 11

Method	df	Value	Probability
Anova F-test	(7, 66)	0.096077	0.9984
Welch F-test*	(7, 27.3921)	0.126847	0.9956

According the table above, the regression had a significant level of 0.998 which is bigger than 0.05. The result makes the regression equation less sufficiently proved the relationship of dependent variable.

CHAPTER 5: CONCLUSION

5.0 Introduction

The objective of the research is to find out the effects of cashless payment towards corruption in Malaysia, Thailand, and Singapore. This study also can determine the effect of each type of cashless payment on corruption, which is direct debit, cheques, and card and e-money. OLS method, as our methodology was utilized to analyze the relationship between corruption level and cashless payment. In this chapter, this research will explain the summary of the study, policy implication, limitation, and recommendation of the research.

5.1 Summary of Study

According to the summary of the study, corruption is the main cause of a country to lose its national integrity and numerous social indecencies tormenting the general public. Corruption happens due to untraceable financial transactions. (Mehrotra & Goel, 2011).

Therefore, the purpose of carrying out this study is to find out the relationship between corruption and cashless payment, which can be detected than physical cash transactions in Malaysia, Thailand, and Singapore. Based on the decision, we planned to determine the effect of each type of cashless payment on corruption.

The types of instruments are cheques, direct debit, card, and e-money. Besides that, we also implement economic prosperity, government size, democracy, and income inequality as our independent variables. We also presented 10-year data from 2007 to 2017 from Freedom House, WID, World development indicators, and included 3 countries which are Malaysia, Thailand, and Singapore in our research.

Firstly, we generate descriptive statistics in this study to review each variable in a separate country for Singapore, Malaysia, and Thailand. Before we start the OLS regression we carry on the Unit Root Test. The test is used to make sure our model is stationary; ADF and PP tests are conducted. We found out that in Singapore, all variable is stationary at second difference while for Malaysia and Thailand variables are stationary at first difference. Then we continue our test in the OLS test and found that in Singapore, GDP and cheque cashless payments have a positive relationship to corruption, while other variables are a negative relationship with corruption.

However, all the variables get high p-value and the model is not significant for OLS. For Malaysia OLS regression, we found that Malaysia's card and e-money payment is a negative relationship to corruption and this is the only variable significant in OLS. Other variable is positively related to corruption but did not signify. Thailand's OLS results indicate that government size, average income, democracy, and cheque payment are positively affected by corruption; while GDP, direct debit, and e-money are a negative effect on corruption.

Thailand had no significant variable in OLS. To check the problem of OLS, we continue to do the diagnostic checking by carrying on the Jarque-Bera test, Ramsey RESET test, ARCH test, and BGLM test. According to the result, we know that Singapore and Malaysia models face problems in model specification, but no heteroscedasticity problem, autocorrelation problem, and normality problem. While Thailand had no model specification problem, no heteroscedasticity problem, autocorrelation problem, and normality problem. Next, we proceed with the ANOVA to do more checking for model significant. From the result, we can know that only the Singapore model is significant but Malaysia and Thailand model is not significant.

5.2 Policy Implication

Basically, e-money indicates to a collection of payment instrument used to make transaction at retail outlets and over the internet computer based correspondence innovations. The Bank for International Settlements (BIS,1996), has characterized electronic cash as the financial worth estimated in cash units stored in electronic form on an electronic device in the in the consumer's possession.

With the end goal of this research a working meaning of e-cash in the Malaysian setting, is taken to incorporate electronic purse activities, for example, MEPS money and stored value card, for example, Touch 'n Go cards for Malaysia. Ramasamy, S. R. et al. (2006)

The implication of the cashless policy was implemented in three countries which are Malaysia, Thailand and Singapore can be determined by seeing the other countries how well does the policy benefits them. For instance, let's take Nigeria for an example, numerous benefits enjoyed by additional developed countries such as the U.S has encouraged the Central Bank of Nigeria (CBN) to implement the cashless policy.

Nigeria as being one of truly outstanding and greatest economies in 2020, the CBN has started executing the cashless policy/ banking in Nigeria. The CBN and Pro cashless policy activists have affirmed a decrease in crime rates limited risk relating with large sum of money, lessening in political corruption, decrease in banking cost, enhancement of monetary policy in management of inflation and overall growth and advancement of the economy of Nigeria as favourable associated with the implementation of the cashless policy Ejike, Sylvester. (2020)

This clearly shows that country that has implemented cashless policy able to benefit from the economic and crime perceptions. However, does the implication plays the same role on corruption?

High money utilization empowers corruption, leakages and money laundering, among other money related deceitful activities. Moreover, this is the apparent effect on the Naira. The system will diminish the pressure on the Naira. This can possibly occur if there is successful and standard cross-border electronic communication's reporting system.

Hence, it is predicted that the cashless system will bring with its transparency in business transactions. CBN claims that the economic advancement of the country depends on the cashless payment system as it would tackle corruption and money laundering, the framework offers the capacity to detect the money trail. If this applied, the necessity for foreign currency would be well determined and the pressure on the naira lessened, hence letting SMEs to be more competitive in the prices.

With the creation of numerous payment options, the process of cash collection will be made simple and the cost and corruption risk associated with cash transfer and processing can be reduced. This will urge government accounting officials to be more transparent. Even though it is workable in controlling corruption through the methods of cashless policy, still it will not combat corruption fully unless executing additional anti-corruption frameworks. In a corrupted country, the implementation of cashless policy will not eradicate corruption.

Overall, cashless policy can only reduce petty corruptions upon the automation process instalments inside government organizations that will support transparency. There is no single most ideal method of managing corruption, it requires an action that comprises of different complex measure in particular circles of society.

Cashless economy itself only will not able to remove corruption except if taken up with a few different measures, including great administration, straightforwardness and responsibility, authoritative oversight, legal changes, common help changes, cultural changes and advancing moral standards. Goh, Y. Y et al. (2019).

What we know that cashless payment will be potential tool to control the corruption, but it not works in insulation from other systems which anti- corruption. What we research some information from internet, the policy of cashless only like a good because of the majority who use the cashless system without honour.

So, the policy of cashless does not work to influence the corruption, this policy unable to control the corruption. Actually, there are no any way to anti-corruption and no any silver bullet of anti-corruption to control corruption. In case the strategy of reduce corruption is to be workable, must be plan as multi-pronged endeavour that combine with a group of complexes.

Besides that, if we need to stop the corruption, we need achieve a group of complex action in different type of society region. The system of cashless need to work together with the polices to control corruption. For example, transparency, accountability, governance police and encouraging principles of ethical. We found some research which run in Nigeria, they find out the opinion of stockholders about the useful need of a no cash community to prevent the corruption resulted that the system of cashless only able to control the petty corruption like associated to action of bureaucratic and no sufficient by itself. It also must put together with other improvement types. (Muhibudeen and Haladu, 2018).

5.3 Limitation of this study

Throughout this research, there were several issues and limitations we had faced that affected the precision and accuracy of the result achieved. The result that we have obtained may not be able to wholly or completely reflect the relationship of cashless payment and the corruption level. In case if there is any future research conducted based on this study would have to be very cautious about the limitations and use the result accordingly.

Those limitations are as below. Firstly, in this research, our cashless payment method sample data is limited for ASEAN countries due to constraints in the availability of data across different countries. It would be good if the sample data can include more ASEAN countries, developed and as well as non- developing countries.

This is because using only a few countries' data may not be able to capture the actual effect of cashless payment methods towards corruption since the results will be more significant if more countries' data were included.

Besides that, the data for cashless payment is only available to certain years as cashless payment was not widely used in the earlier years in Asia so data was not available before. Therefore, the data plays an important issue in this study. Besides that, in this research, the benchmark used to capture the corruption level in the three countries in the corruption perception index CPI.

Different scales can be used to measure the corruption level and each website uses different scales. For example, the data of corruption level that we obtain is from Transparency International where it measures the corruption level using the score from 1 to 100.

Where else, the World Bank uses a different scale to measure the corruption level. The unit of measurement uses may affect the robustness of the result obtain because each independent variable might have various sensitivity towards different dependent variable data. Thus, future researchers need to be extra cautious of these limitations while using information from this study.

5.4 Recommendation for Future Research

There are several recommendations to any researchers who going to explore or study more on this topic. Firstly, this study recommends that in future studies or research is to investigate the cashless payment method of more countries rather than only focusing on fewer countries or only particularly ASEAN countries this is because that we can get a clearer perspective about the effect of cashless payment towards corruption.

Besides that, it is also due to the method of the cashless settlement are not the same and it varies across different countries, thus this will also have a different effect on the corruption level of each country. To increase the robustness and the reliability of a study the sample size needed to be increased.

Lastly, various countries have their conception of corruption, therefore the researchers are required to understand the concept of corruption in each country before further studying and the styles of collecting data across countries also vary across countries. Through this, it helps to increase the robustness and the reliability of the data and will minimize the effects of biases.

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APPENDICES

APPENDIX 4.1 Singapore Ordinary Least Square Method

APPENDIX 4.1 Singapore Ordinary Least Square Method

Dependent Variable: LCPI
Method: Least Squares
Date: 09/29/20 Time: 00:31
Sample: 2007 2017
Included observations: 11

Variable	Coefficient	Std. Error	t-Statistic	Prob.
LCHEQUE	-0.048081	0.187182	-0.256868	0.8100
LCARD	-0.249035	0.163000	-1.527826	0.2013
LDEBIT	-0.089891	0.096054	-0.935833	0.4023
LGOV	0.103029	0.176900	0.582414	0.5915
LDEMO1	-0.602686	0.276458	-2.180025	0.0947
LGDP2	0.316363	0.219825	1.439157	0.2235
C	4.651555	1.935958	2.402714	0.0741

R-squared	0.961229	Mean dependent var	4.480538
Adjusted R-squared	0.903071	S.D. dependent var	0.045031
S.E. of regression	0.014020	Akaike info criterion	-5.435599
Sum squared resid	0.000786	Schwarz criterion	-5.182393
Log likelihood	36.89579	Hannan-Quinn criter.	-5.595210
F-statistic	16.52810	Durbin-Watson stat	2.507228
Prob(F-statistic)	0.008560		

APPENDIX 4.2 Malaysia Ordinary Least Square Method

APPENDIX 4.2 Malaysia Ordinary Least Square Method

Dependent Variable: ICPI
Method: Least Squares
Date: 10/01/20 Time: 00:06
Sample: 2007 2017
Included observations: 11

Variable	Coefficient	Std. Error	t-Statistic	Prob.
IDEMO	-0.136381	0.852183	-0.160038	0.8806
IDIRECT	0.235854	0.057759	4.083414	0.0151
IGDP2	0.479619	0.169231	2.834102	0.0471
IGOV	0.262754	0.481465	0.545738	0.6143
ICHEQUES	0.004551	0.014779	0.307917	0.7735
ICARD	-0.662785	0.161773	-4.097002	0.0149
C	4.737575	2.853951	1.660006	0.1723

R-squared	0.857294	Mean dependent var	3.876712
Adjusted R-squared	0.643235	S.D. dependent var	0.067304
S.E. of regression	0.040201	Akaike info criterion	-3.328742
Sum squared resid	0.006464	Schwarz criterion	-3.075536
Log likelihood	25.30808	Hannan-Quinn criter.	-3.488353
F-statistic	4.004943	Durbin-Watson stat	2.119786
Prob(F-statistic)	0.100185		

APPENDIX 4.3 Thailand Ordinary Least Square Method

APPENDIX 4.3 Thailand Ordinary Least Square Method

Dependent Variable: ICPI
Method: Least Squares
Date: 10/01/20 Time: 01:14
Sample: 2007 2017
Included observations: 11

Variable	Coefficient	Std. Error	t-Statistic	Prob.
ICHEQUE	0.122195	0.346543	0.352613	0.7422
ICARD	0.020062	0.064263	0.312188	0.7705
IACL	-0.050167	0.300201	-0.167111	0.8754
IDIRECT	-0.037957	0.122921	-0.308789	0.7729
IGDP	0.228512	0.450938	0.506749	0.6390
IGOV	0.246484	0.408006	0.604118	0.5784
C	-0.104063	3.064282	-0.033960	0.9745

R-squared	0.572225	Mean dependent var	3.569784
Adjusted R-squared	-0.069438	S.D. dependent var	0.047489
S.E. of regression	0.049111	Akaike info criterion	-2.928359
Sum squared resid	0.009647	Schwarz criterion	-2.675153
Log likelihood	23.10597	Hannan-Quinn criter.	-3.087970
F-statistic	0.891784	Durbin-Watson stat	3.014118
Prob(F-statistic)	0.572173		

APPENDIX 4.4.1 MULTICOLLINEARITY

APPENDIX 4.4.1a. Pair-Wise Correlation Coefficient of Singapore

	LCPI	LCHEQUE	LCARD	LDEBIT	LGOV	LDEMO1	LGDP2
LCPI	1	-0.3342892...	-0.9179411...	-0.9078665...	-0.3644705...	-0.5595109...	-0.8323195...
LCHE...	-0.3342892...	1	0.36020596...	0.44647089...	-0.4719288...	0.55942707...	0.58998846...
LCARD	-0.9179411...	0.36020596...	1	0.97971389...	0.35619226...	0.34282135...	0.94870381...
LDEBIT	-0.9078665...	0.44647089...	0.97971389...	1	0.28190495...	0.36557844...	0.95883987...
LGOV	-0.3644705...	-0.4719288...	0.35619226...	0.28190495...	1	-0.1604822...	0.09287917...
LDEMO1	-0.5595109...	0.55942707...	0.34282135...	0.36557844...	-0.1604822...	1	0.40018112...
LGDP2	-0.8323195...	0.58998846...	0.94870381...	0.95883987...	0.09287917...	0.40018112...	1

APPENDIX 4.4.1b. Pair-Wise Correlation Coefficient of Malaysia

	ICPI	IDEMO	IDIRECT	IGDP2	IGOV	ICHEQUES	ICARD
ICPI	1.000000	-0.344587	0.367655	0.142320	-0.145708	-0.176370	0.078802
IDEMO	-0.344587	1.000000	-0.787329	-0.278603	0.320214	0.034055	-0.617804
IDIRECT	0.367655	-0.787329	1.000000	0.557451	0.152399	-0.105959	0.901351
IGDP2	0.142320	-0.278603	0.557451	1.000000	0.636999	-0.267391	0.782657
IGOV	-0.145708	0.320214	0.152399	0.636999	1.000000	-0.333392	0.435590
ICHEQUES	-0.176370	0.034055	-0.105959	-0.267391	-0.333392	1.000000	-0.125598
ICARD	0.078802	-0.617804	0.901351	0.782657	0.435590	-0.125598	1.000000

APPENDIX 4.4.1c. Pair-Wise Correlation Coefficient of Thailand

	ICPI	ICHEQUE	ICARD	IACL	IDIRECT	IGDP	IGOV
ICPI	1.000000	0.518361	-0.327180	-0.408358	0.640370	0.694775	0.656969
ICHEQUE	0.518361	1.000000	0.049831	-0.246758	0.524716	0.507691	0.331482
ICARD	-0.327180	0.049831	1.000000	0.099241	-0.387838	-0.657342	-0.561039
IACL	-0.408358	-0.246758	0.099241	1.000000	-0.789002	-0.568782	-0.476430
IDIRECT	0.640370	0.524716	-0.387838	-0.789002	1.000000	0.905305	0.739569
IGDP	0.694775	0.507691	-0.657342	-0.568782	0.905305	1.000000	0.808999
IGOV	0.656969	0.331482	-0.561039	-0.476430	0.739569	0.808999	1.000000

APPENDIX 4.4.2 HETERPSCEDASTICITY

APPENDIX 4.4.2a Autoregressive Conditional Heteroscedasticity (ARCH) Test io Singapore

Heteroskedasticity Test: ARCH

F-statistic	0.003890	Prob. F(1,8)	0.9518
Obs*R-squared	0.004860	Prob. Chi-Square(1)	0.9444

Test Equation:
Dependent Variable: RESID^2
Method: Least Squares
Date: 10/01/20 Time: 01:22
Sample (adjusted): 2008 2017
Included observations: 10 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	7.87E-05	4.54E-05	1.733540	0.1212
RESID^2(-1)	-0.021724	0.348329	-0.062366	0.9518

R-squared	0.000486	Mean dependent var	7.71E-05
Adjusted R-squared	-0.124453	S.D. dependent var	0.000114
S.E. of regression	0.000120	Akaike info criterion	-15.03312
Sum squared resid	1.16E-07	Schwarz criterion	-14.97260
Log likelihood	77.16561	Hannan-Quinn criter.	-15.09951
F-statistic	0.003890	Durbin-Watson stat	2.041469
Prob(F-statistic)	0.951801		

APPENDIX 4.4.2b Autoregressive Conditional Heteroscedasticity (ARCH) Test of Malaysia

Heteroskedasticity Test: ARCH

F-statistic	0.138566	Prob. F(1,8)	0.7194
Obs*R-squared	0.170259	Prob. Chi-Square(1)	0.6799

Test Equation:
Dependent Variable: RESID^2
Method: Least Squares
Date: 10/01/20 Time: 00:40
Sample (adjusted): 2008 2017
Included observations: 10 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	0.000575	0.000293	1.958053	0.0859
RESID^2(-1)	0.134922	0.362454	0.372245	0.7194

R-squared	0.017026	Mean dependent var	0.000644

Adjusted R-squared	-0.105846	S.D. dependent var	0.000683
S.E. of regression	0.000718	Akaike info criterion	-11.46298
Sum squared resid	4.13E-06	Schwarz criterion	-11.40246
Log likelihood	59.31489	Hannan-Quinn criter.	-11.52937
F-statistic	0.138566	Durbin-Watson stat	1.825855
Prob(F-statistic)	0.719378		

APPENDIX 4.4.2c Autoregressive Conditional Heteroscedasticity (ARCH) Test of Thailand

Heteroskedasticity Test: ARCH

F-statistic	0.518775	Prob. F(1,8)	0.4919
Obs*R-squared	0.608979	Prob. Chi-Square(1)	0.4352

Test Equation:
Dependent Variable: RESID^2
Method: Least Squares
Date: 10/01/20 Time: 01:23
Sample (adjusted): 2008 2017
Included observations: 10 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	0.000732	0.000417	1.752759	0.1177
RESID^2(-1)	0.243477	0.338039	0.720261	0.4919

R-squared	0.060898	Mean dependent var	0.000964
Adjusted R-squared	-0.056490	S.D. dependent var	0.000814
S.E. of regression	0.000836	Akaike info criterion	-11.15793
Sum squared resid	5.60E-06	Schwarz criterion	-11.09741
Log likelihood	57.78963	Hannan-Quinn criter.	-11.22431
F-statistic	0.518775	Durbin-Watson stat	2.069706
Prob(F-statistic)	0.491870		

APPENDIX 4.4.3 AUTOCORRELATION

APPENDIX 4.4.3a Breush-Godfrey Serial Correlation LM Test Singapore

Breusch-Godfrey Serial Correlation LM Test:
Null hypothesis: No serial correlation at up to 2 lags

F-statistic	5.994749	Prob. F(2,2)	0.1430
Obs*R-squared	9.427392	Prob. Chi-Square(2)	0.0090

Test Equation:
Dependent Variable: RESID
Method: Least Squares
Date: 10/01/20 Time: 01:21
Sample: 2007 2017
Included observations: 11
Presample missing value lagged residuals set to zero.

Variable	Coefficient	Std. Error	t-Statistic	Prob.
LCHEQUE	-0.184856	0.115699	-1.597733	0.2512
LCARD	-0.172176	0.101167	-1.701896	0.2309
LDEBIT	-0.040658	0.052688	-0.771661	0.5210
LGOV	0.029141	0.095246	0.305952	0.7886
LDEMO1	0.212679	0.160692	1.323520	0.3167
LGDP2	0.375149	0.161613	2.321281	0.1460
C	-2.765169	1.307662	-2.114590	0.1688
RESID(-1)	-1.599883	0.492092	-3.251188	0.0830
RESID(-2)	-1.400025	0.454997	-3.077000	0.0914

R-squared	0.857036	Mean dependent var	8.88E-16
Adjusted R-squared	0.285178	S.D. dependent var	0.008867
S.E. of regression	0.007497	Akaike info criterion	-7.017122
Sum squared resid	0.000112	Schwarz criterion	-6.691571
Log likelihood	47.59417	Hannan-Quinn criter.	-7.222336
F-statistic	1.498687	Durbin-Watson stat	2.481900
Prob(F-statistic)	0.460495		

APPENDIX 4.4.3b Breush-Godfrey Serial Correlation LM Test Malaysia

Breusch-Godfrey Serial Correlation LM Test:
Null hypothesis: No serial correlation at up to 2 lags

F-statistic	0.577411	Prob. F(2,2)	0.6340
Obs*R-squared	4.026548	Prob. Chi-Square(2)	0.1336

Test Equation:
Dependent Variable: RESID
Method: Least Squares
Date: 10/01/20 Time: 00:35
Sample: 2007 2017
Included observations: 11
Presample missing value lagged residuals set to zero.

Variable	Coefficient	Std. Error	t-Statistic	Prob.

IDEMO	0.208016	0.983364	0.211536	0.8521
IDIRECT	-0.009345	0.067144	-0.139185	0.9021
IGDP2	-0.112950	0.220030	-0.513339	0.6588
IGOV	-0.246321	0.588630	-0.418464	0.7163
ICHEQUES	0.022125	0.027508	0.804285	0.5056
ICARD	0.147041	0.229625	0.640354	0.5875
C	-0.955777	3.371188	-0.283513	0.8034
RESID(-1)	-1.167970	1.153870	-1.012220	0.4180
RESID(-2)	-1.498603	1.501084	-0.998347	0.4233

R-squared	0.366050	Mean dependent var	2.42E-16
Adjusted R-squared	-2.169751	S.D. dependent var	0.025425
S.E. of regression	0.045266	Akaike info criterion	-3.420890
Sum squared resid	0.004098	Schwarz criterion	-3.095340
Log likelihood	27.81490	Hannan-Quinn criter.	-3.626105
F-statistic	0.144353	Durbin-Watson stat	2.230934
Prob(F-statistic)	0.982046		

APPENDIX 4.4.3c Breush-Godfrey Serial Correlation LM Test Thailand

Breusch-Godfrey Serial Correlation LM Test:
Null hypothesis: No serial correlation at up to 2 lags

F-statistic	5.908695	Prob. F(2,2)	0.1447
Obs*R-squared	9.407803	Prob. Chi-Square(2)	0.0091

Test Equation:
Dependent Variable: RESID
Method: Least Squares
Date: 10/01/20 Time: 01:22
Sample: 2007 2017
Included observations: 11
Presample missing value lagged residuals set to zero.

Variable	Coefficient	Std. Error	t-Statistic	Prob.
ICHEQUE	0.265672	0.223004	1.191331	0.3557
ICARD	-0.050771	0.037784	-1.343721	0.3112
IACL	-0.421245	0.217487	-1.936876	0.1924
IDIRECT	0.033808	0.080523	0.419856	0.7154
IGDP	-0.568775	0.299620	-1.898318	0.1981
IGOV	0.366945	0.249080	1.473199	0.2786
C	2.510592	2.076271	1.209183	0.3501
RESID(-1)	-1.823861	0.537695	-3.391999	0.0770
RESID(-2)	-0.762776	0.486594	-1.567583	0.2575

R-squared	0.855255	Mean dependent var	4.89E-16
Adjusted R-squared	0.276274	S.D. dependent var	0.031060
S.E. of regression	0.026424	Akaike info criterion	-4.497503
Sum squared resid	0.001396	Schwarz criterion	-4.171952
Log likelihood	33.73627	Hannan-Quinn criter.	-4.702717
F-statistic	1.477174	Durbin-Watson stat	2.341775
Prob(F-statistic)	0.464965		

APPENDIX 4.4.4 MODEL SPECIFICATION

APPENDIX 4.4.4a Ramsey Regression Equation Specification Error Test (RESET) Test Singapore

Ramsey RESET Test
Equation: UNTITLED
Omitted Variables: Squares of fitted values
Specification: LCPI LCHEQUE LCARD LDEBIT LGOV LDEMO1 LGDP2 C

	Value	df	Probability
t-statistic	0.496540	3	0.6536
F-statistic	0.246552	(1, 3)	0.6536
Likelihood ratio	0.868793	1	0.3513

F-test summary:

	Sum of Sq.	df	Mean Squares
Test SSR	5.97E-05	1	5.97E-05
Restricted SSR	0.000786	4	0.000197
Unrestricted SSR	0.000726	3	0.000242

LR test summary:

	Value
Restricted LogL	36.89579
Unrestricted LogL	37.33019

Unrestricted Test Equation:
Dependent Variable: LCPI
Method: Least Squares
Date: 10/01/20 Time: 01:21
Sample: 2007 2017
Included observations: 11

Variable	Coefficient	Std. Error	t-Statistic	Prob.
LCHEQUE	2.623766	5.384945	0.487241	0.6595
LCARD	13.55059	27.79218	0.487568	0.6593
LDEBIT	4.798827	9.846154	0.487381	0.6594
LGOV	-5.616818	11.52109	-0.487525	0.6593
LDEMO1	32.67847	67.02690	0.487543	0.6593
LGDP2	-17.10785	35.09214	-0.487512	0.6593
C	-128.8416	268.8555	-0.479222	0.6645
FITTED^2	6.158279	12.40239	0.496540	0.6536

R-squared	0.964173	Mean dependent var	4.480538
Adjusted R-squared	0.880576	S.D. dependent var	0.045031
S.E. of regression	0.015562	Akaike info criterion	-5.332762
Sum squared resid	0.000726	Schwarz criterion	-5.043383
Log likelihood	37.33019	Hannan-Quinn criter.	-5.515174
F-statistic	11.53365	Durbin-Watson stat	2.620869
Prob(F-statistic)	0.034898		

APPENDIX 4.4.4b Ramsey Regression Equation Specification Error Test (RESET) Test Malaysia

Ramsey RESET Test
Equation: UNTITLED
Omitted Variables: Squares of fitted values
Specification: ICPI IDEMO IDIRECT IGDP2 IGOV ICHEQUES ICARD C

	Value	df	Probability
t-statistic	2.311922	3	0.1038
F-statistic	5.344983	(1, 3)	0.1038
Likelihood ratio	11.25353	1	0.0008

F-test summary:

	Sum of Sq.	df	Mean Squares
Test SSR	0.004140	1	0.004140
Restricted SSR	0.006464	4	0.001616
Unrestricted SSR	0.002324	3	0.000775

LR test summary:

	Value
Restricted LogL	25.30808
Unrestricted LogL	30.93485

Unrestricted Test Equation:
Dependent Variable: ICPI
Method: Least Squares
Date: 10/01/20 Time: 00:42
Sample: 2007 2017
Included observations: 11

Variable	Coefficient	Std. Error	t-Statistic	Prob.
IDEMO	8.012261	3.573658	2.242034	0.1108
IDIRECT	-14.99363	6.587492	-2.276076	0.1073
IGDP2	-30.66294	13.47093	-2.276230	0.1073
IGOV	-16.18425	7.121801	-2.272494	0.1077
ICHEQUES	-0.286113	0.126140	-2.268226	0.1081
ICARD	42.14645	18.51707	2.276086	0.1073
C	-174.6507	77.61787	-2.250136	0.1099
FITTED^2	8.386297	3.627414	2.311922	0.1038

R-squared	0.948698	Mean dependent var	3.876712

Adjusted R-squared	0.828992	S.D. dependent var	0.067304
S.E. of regression	0.027832	Akaike info criterion	-4.169972
Sum squared resid	0.002324	Schwarz criterion	-3.880594
Log likelihood	30.93485	Hannan-Quinn criter.	-4.352384
F-statistic	7.925251	Durbin-Watson stat	2.206282
Prob(F-statistic)	0.058401		

APPENDIX 4.4.4c Ramsey Regression Equation Specification Error Test (RESET) Test Thailand

Ramsey RESET Test
Equation: UNTITLED
Omitted Variables: Squares of fitted values
Specification: ICPI IDEMO IDIRECT IGDP2 IGOV ICHEQUES ICARD C

	Value	df	Probability
t-statistic	2.311922	3	0.1038
F-statistic	5.344983	(1, 3)	0.1038
Likelihood ratio	11.25353	1	0.0008

F-test summary:

	Sum of Sq.	df	Mean Squares
Test SSR	0.004140	1	0.004140
Restricted SSR	0.006464	4	0.001616
Unrestricted SSR	0.002324	3	0.000775

LR test summary:

	Value
Restricted LogL	25.30808
Unrestricted LogL	30.93485

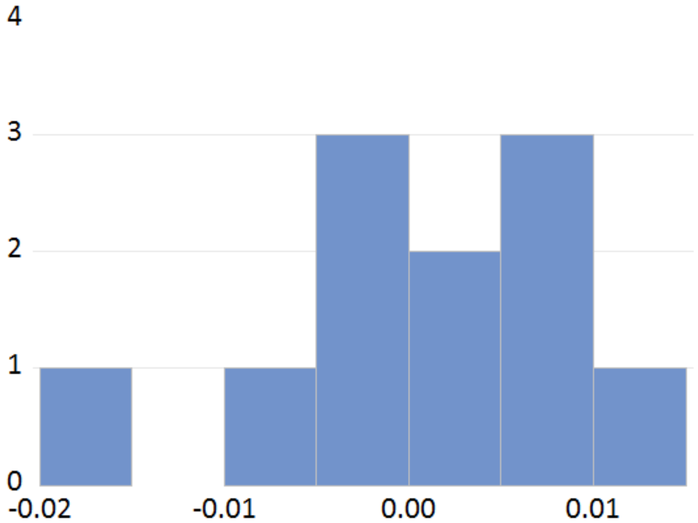
Unrestricted Test Equation:
Dependent Variable: ICPI
Method: Least Squares
Date: 10/01/20 Time: 00:42
Sample: 2007 2017
Included observations: 11

Variable	Coefficient	Std. Error	t-Statistic	Prob.
IDEMO	8.012261	3.573658	2.242034	0.1108
IDIRECT	-14.99363	6.587492	-2.276076	0.1073
IGDP2	-30.66294	13.47093	-2.276230	0.1073
IGOV	-16.18425	7.121801	-2.272494	0.1077
ICHEQUES	-0.286113	0.126140	-2.268226	0.1081
ICARD	42.14645	18.51707	2.276086	0.1073
C	-174.6507	77.61787	-2.250136	0.1099
FITTED^2	8.386297	3.627414	2.311922	0.1038

R-squared	0.948698	Mean dependent var	3.876712
Adjusted R-squared	0.828992	S.D. dependent var	0.067304
S.E. of regression	0.027832	Akaike info criterion	-4.169972
Sum squared resid	0.002324	Schwarz criterion	-3.880594
Log likelihood	30.93485	Hannan-Quinn criter.	-4.352384
F-statistic	7.925251	Durbin-Watson stat	2.206282
Prob(F-statistic)	0.058401		

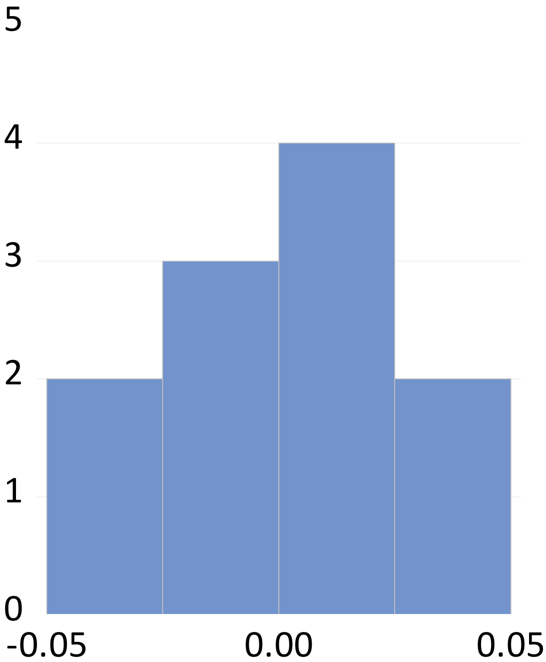
APPENDIX 4.4.5 NORMALITY TEST

APPENDIX 4.4.5a Jarque-Bera Test Singapore



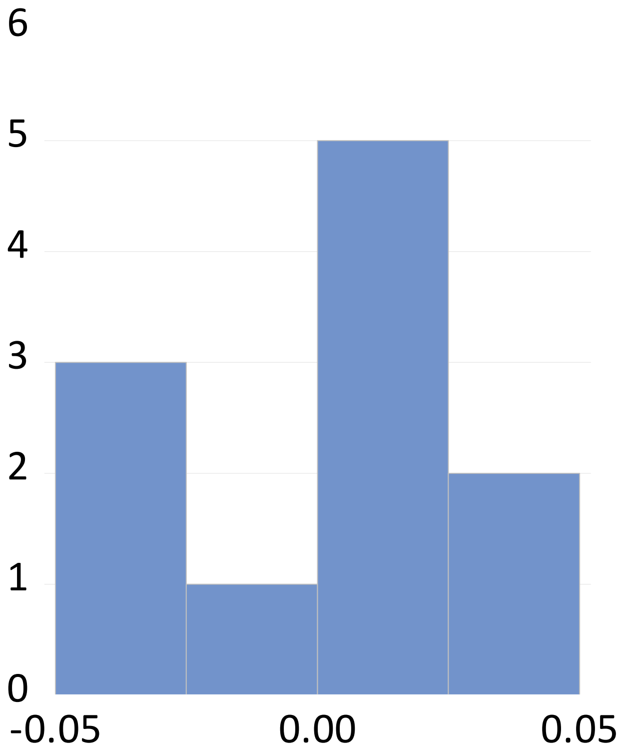
Series: Residuals	
Sample 2007 2017	
Observations 11	
Mean	8.88e-16
Median	0.001021
Maximum	0.011191
Minimum	-0.019432
Std. Dev.	0.008867
Skewness	-0.812684
Kurtosis	3.130529
Jarque-Bera	1.218643
Probability	0.543720

APPENDIX 4.4.5b Jarque-Bera Test Malaysia



Series: Residuals	
Sample 2007 2017	
Observations 11	
Mean	2.42e-16
Median	0.000397
Maximum	0.038403
Minimum	-0.042647
Std. Dev.	0.025425
Skewness	-0.214472
Kurtosis	2.195930
Jarque-Bera	0.380655
Probability	0.826688

APPENDIX 4.4.5c Jarque-Bera Test Thailand



Series: Residuals
Sample 2007 2017
Observations 11

Mean	4.89e-16
Median	0.009665
Maximum	0.044321
Minimum	-0.049616
Std. Dev.	0.031060
Skewness	-0.257579
Kurtosis	1.803486
Jarque-Bera	0.777807
Probability	0.677800

APPENDIX 4.5 UNIT ROOT TEST

APPENDIX 4.5.1 Singapore Augmented Dickey-Fuller test

Corruption Perspective Index Augmented Dickey-Fuller test On Level with intercept

Null Hypothesis: LCPI has a unit root
Exogenous: Constant
Lag Length: 0 (Automatic - based on SIC, maxlag=1)

		t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic		-0.690354	0.8052
Test critical values:	1% level	-4.297073	
	5% level	-3.212696	
	10% level	-2.747676	

Corruption Perspective Index Augmented Dickey-Fuller test On Level with Trend and intercept

Null Hypothesis: LCPI has a unit root
Exogenous: Constant, Linear Trend
Lag Length: 0 (Automatic - based on SIC, maxlag=1)

		t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic		-1.739955	0.6570
Test critical values:	1% level	-5.295384	
	5% level	-4.008157	
	10% level	-3.460791	

Corruption Perspective Index Augmented Dickey-Fuller test 1st Level with intercept

Null Hypothesis: D(LCPI) has a unit root
Exogenous: Constant
Lag Length: 0 (Automatic - based on SIC, maxlag=1)

		t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic		-2.634260	0.1213
Test critical values:	1% level	-4.420595	
	5% level	-3.259808	
	10% level	-2.771129	

Corruption Perspective Index Augmented Dickey-Fuller test 1st Level with Trend and intercept

Null Hypothesis: D(LCPI) has a unit root
Exogenous: Constant, Linear Trend
Lag Length: 0 (Automatic - based on SIC, maxlag=1)

		t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic		-2.426119	0.3470
Test critical values:	1% level	-5.521860	
	5% level	-4.107833	
	10% level	-3.515047	

Corruption Perspective Index Augmented Dickey-Fuller test 2nd Level with intercept

Null Hypothesis: D(LCPI,2) has a unit root
Exogenous: Constant
Lag Length: 0 (Automatic - based on SIC, maxlag=1)

		t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic		-4.137915	0.0174
Test critical values:	1% level	-4.582648	
	5% level	-3.320969	
	10% level	-2.801384	

Corruption Perspective Index Augmented Dickey-Fuller test 2nd Level with Trend and intercept

Null Hypothesis: D(LCPI,2) has a unit root
Exogenous: Constant, Linear Trend
Lag Length: 0 (Automatic - based on SIC, maxlag=1)

		t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic		-3.851975	0.0769
Test critical values:	1% level	-5.835186	
	5% level	-4.246503	
	10% level	-3.590496	

Cashless Payment Cheque Augmented Dickey-Fuller test On Level with intercept

Null Hypothesis: LCHEQUE has a unit root
Exogenous: Constant
Lag Length: 0 (Automatic - based on SIC, maxlag=1)

		t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic		-1.715019	0.3954
Test critical values:	1% level	-4.297073	
	5% level	-3.212696	
	10% level	-2.747676	

Cashless Payment Cheque Augmented Dickey-Fuller test On Level with Trend and intercept

Null Hypothesis: LCHEQUE has a unit root
Exogenous: Constant, Linear Trend
Lag Length: 1 (Automatic - based on SIC, maxlag=1)

		t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic		-1.933402	0.5587
Test critical values:	1% level	-5.521860	
	5% level	-4.107833	
	10% level	-3.515047	

Cashless Payment Cheque Augmented Dickey-Fuller test 1st Level with intercept

Null Hypothesis: D(LCHEQUE) has a unit root
Exogenous: Constant
Lag Length: 0 (Automatic - based on SIC, maxlag=1)

		t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic		-2.695449	0.1113
Test critical values:	1% level	-4.420595	
	5% level	-3.259808	
	10% level	-2.771129	

Cashless Payment Cheque Augmented Dickey-Fuller test 1st Level with Trend and intercept

Null Hypothesis: D(LCHEQUE) has a unit root
Exogenous: Constant, Linear Trend
Lag Length: 0 (Automatic - based on SIC, maxlag=1)

		t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic		-2.591547	0.2928
Test critical values:	1% level	-5.521860	
	5% level	-4.107833	
	10% level	-3.515047	

Cashless Payment Cheque Augmented Dickey-Fuller test 2nd Level with intercept

Null Hypothesis: D(LCHEQUE,2) has a unit root
Exogenous: Constant
Lag Length: 0 (Automatic - based on SIC, maxlag=1)

		t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic		-3.505313	0.0393
Test critical values:	1% level	-4.582648	
	5% level	-3.320969	
	10% level	-2.801384	

Cashless Payment Cheque Augmented Dickey-Fuller test 2nd Level with Trend and intercept

Null Hypothesis: D(LCHEQUE,2) has a unit root
Exogenous: Constant, Linear Trend
Lag Length: 0 (Automatic - based on SIC, maxlag=1)

		t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic		-3.403166	0.1250
Test critical values:	1% level	-5.835186	
	5% level	-4.246503	
	10% level	-3.590496	

Cashless Payment Card and E-money Augmented Dickey-Fuller test On Level with intercept

Null Hypothesis: LCARD has a unit root
Exogenous: Constant
Lag Length: 0 (Automatic - based on SIC, maxlag=1)

		t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic		-3.210159	0.0502
Test critical values:	1% level	-4.297073	
	5% level	-3.212696	
	10% level	-2.747676	

Cashless Payment Card and E-money Augmented Dickey-Fuller test On Level with Trend and intercept

Null Hypothesis: LCARD has a unit root
Exogenous: Constant, Linear Trend
Lag Length: 1 (Automatic - based on SIC, maxlag=1)

		t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic		0.858991	0.9980
Test critical values:	1% level	-5.521860	
	5% level	-4.107833	
	10% level	-3.515047	

Cashless Payment Card and E-money Augmented Dickey-Fuller test 1st Level with intercept

Null Hypothesis: D(LCARD) has a unit root
Exogenous: Constant
Lag Length: 1 (Automatic - based on SIC, maxlag=1)

		t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic		-0.003482	0.9300
Test critical values:	1% level	-4.582648	
	5% level	-3.320969	
	10% level	-2.801384	

Cashless Payment Card and E-money Augmented Dickey-Fuller test 1st Level with Trend and intercept

Null Hypothesis: D(LCARD) has a unit root
Exogenous: Constant, Linear Trend
Lag Length: 1 (Automatic - based on SIC, maxlag=1)

		t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic		-4.885130	0.0261
Test critical values:	1% level	-5.835186	
	5% level	-4.246503	
	10% level	-3.590496	

Cashless Payment Card and E-money Augmented Dickey-Fuller test 2nd Level with intercept

Null Hypothesis: D(LCARD,2) has a unit root
Exogenous: Constant
Lag Length: 1 (Automatic - based on SIC, maxlag=1)

		t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic		-4.309245	0.0173
Test critical values:	1% level	-4.803492	
	5% level	-3.403313	
	10% level	-2.841819	

Cashless Payment Card and E-money Augmented Dickey-Fuller test 2nd Level with Trend and intercept

Null Hypothesis: D(LCARD,2) has a unit root
Exogenous: Constant, Linear Trend
Lag Length: 1 (Automatic - based on SIC, maxlag=1)

		t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic		-4.576285	0.0456
Test critical values:	1% level	-6.292057	
	5% level	-4.450425	
	10% level	-3.701534	

Cashless Payment Direct Debit Augmented Dickey-Fuller test On Level with intercept

Null Hypothesis: LDEBIT has a unit root
Exogenous: Constant
Lag Length: 0 (Automatic - based on SIC, maxlag=1)

		t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic		-0.438146	0.8662
Test critical values:	1% level	-4.297073	
	5% level	-3.212696	
	10% level	-2.747676	

Cashless Payment Direct Debit Augmented Dickey-Fuller test On Level with Trend and intercept

Null Hypothesis: LDEBIT has a unit root
Exogenous: Constant, Linear Trend
Lag Length: 1 (Automatic - based on SIC, maxlag=1)

		t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic		-1.851621	0.6008
Test critical values:	1% level	-5.521860	
	5% level	-4.107833	
	10% level	-3.515047	

Cashless Payment Direct Debit Augmented Dickey-Fuller test 1st Level with intercept

Null Hypothesis: D(LDEBIT) has a unit root
Exogenous: Constant
Lag Length: 1 (Automatic - based on SIC, maxlag=1)

		t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic		-3.401495	0.0450
Test critical values:	1% level	-4.582648	
	5% level	-3.320969	
	10% level	-2.801384	

Cashless Payment Direct Debit Augmented Dickey-Fuller test 1st Level with Trend and intercept

Null Hypothesis: D(LDEBIT) has a unit root
Exogenous: Constant, Linear Trend
Lag Length: 1 (Automatic - based on SIC, maxlag=1)

		t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic		-13.92805	0.0001
Test critical values:	1% level	-5.835186	
	5% level	-4.246503	
	10% level	-3.590496	

Government Size Augmented Dickey-Fuller test On Level with intercept

Null Hypothesis: LGOV has a unit root
Exogenous: Constant
Lag Length: 0 (Automatic - based on SIC, maxlag=1)

		t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic		-2.010796	0.2781
Test critical values:	1% level	-4.297073	
	5% level	-3.212696	
	10% level	-2.747676	

Government Size Augmented Dickey-Fuller test On Level with Trend and intercept

Null Hypothesis: LGOV has a unit root
Exogenous: Constant, Linear Trend
Lag Length: 0 (Automatic - based on SIC, maxlag=1)

		t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic		-1.984739	0.5400
Test critical values:	1% level	-5.295384	
	5% level	-4.008157	
	10% level	-3.460791	

Government Size Augmented Dickey-Fuller test 1st Level with intercept

Null Hypothesis: D(LGOV) has a unit root
Exogenous: Constant
Lag Length: 0 (Automatic - based on SIC, maxlag=1)

		t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic		-3.747618	0.0252
Test critical values:	1% level	-4.420595	
	5% level	-3.259808	
	10% level	-2.771129	

Government Size Augmented Dickey-Fuller test 1st Level with Trend and intercept

Null Hypothesis: D(LGOV) has a unit root
Exogenous: Constant, Linear Trend
Lag Length: 0 (Automatic - based on SIC, maxlag=1)

		t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic		-3.766418	0.0753
Test critical values:	1% level	-5.521860	
	5% level	-4.107833	
	10% level	-3.515047	

Democracy Index Augmented Dickey-Fuller test On Level with intercept

Null Hypothesis: LDEMO1 has a unit root
Exogenous: Constant
Lag Length: 0 (Automatic - based on SIC, maxlag=1)

		t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic		-1.874312	0.3291
Test critical values:	1% level	-4.297073	
	5% level	-3.212696	
	10% level	-2.747676	

Democracy Index Augmented Dickey-Fuller test On Level with Trend and intercept

Null Hypothesis: LDEMO1 has a unit root
Exogenous: Constant, Linear Trend
Lag Length: 1 (Automatic - based on SIC, maxlag=1)

		t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic		-2.765632	0.2442
Test critical values:	1% level	-5.521860	
	5% level	-4.107833	
	10% level	-3.515047	

Democracy Index Augmented Dickey-Fuller test 1stLevel with intercept

Null Hypothesis: D(LDEMO1) has a unit root
Exogenous: Constant
Lag Length: 0 (Automatic - based on SIC, maxlag=1)

		t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic		-2.645751	0.1194
Test critical values:	1% level	-4.420595	
	5% level	-3.259808	
	10% level	-2.771129	

Democracy Index Augmented Dickey-Fuller test 1st Level with Trend and intercept

Null Hypothesis: D(LDEMO1) has a unit root
Exogenous: Constant, Linear Trend
Lag Length: 0 (Automatic - based on SIC, maxlag=1)

		t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic		-2.457437	0.3359
Test critical values:	1% level	-5.521860	
	5% level	-4.107833	
	10% level	-3.515047	

Democracy Index Augmented Dickey-Fuller test 2nd Level with intercept

Null Hypothesis: D(LDEMO1,2) has a unit root
Exogenous: Constant
Lag Length: 0 (Automatic - based on SIC, maxlag=1)

		t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic		-3.680708	0.0312
Test critical values:	1% level	-4.582648	
	5% level	-3.320969	
	10% level	-2.801384	

Democracy Index Augmented Dickey-Fuller test 2nd Level with Trend and intercept

Null Hypothesis: D(LDEMO1,2) has a unit root
Exogenous: Constant, Linear Trend
Lag Length: 0 (Automatic - based on SIC, maxlag=1)

		t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic		-3.451712	0.1191
Test critical values:	1% level	-5.835186	
	5% level	-4.246503	
	10% level	-3.590496	

Economy Growth Augmented Dickey-Fuller test On Level with intercept

Null Hypothesis: LGDP2 has a unit root
Exogenous: Constant
Lag Length: 0 (Automatic - based on SIC, maxlag=1)

		t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic		-1.050100	0.6895
Test critical values:	1% level	-4.297073	
	5% level	-3.212696	
	10% level	-2.747676	

Economy Growth Augmented Dickey-Fuller test On Level withTrend and intercept

Null Hypothesis: LGDP2 has a unit root
Exogenous: Constant, Linear Trend
Lag Length: 1 (Automatic - based on SIC, maxlag=1)

		t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic		-1.860299	0.5960
Test critical values:	1% level	-5.521860	
	5% level	-4.107833	
	10% level	-3.515047	

Economy Growth Augmented Dickey-Fuller test 1st Level with intercept

Null Hypothesis: D(LGDP2) has a unit root
Exogenous: Constant
Lag Length: 0 (Automatic - based on SIC, maxlag=1)

		t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic		-2.200328	0.2177
Test critical values:	1% level	-4.420595	
	5% level	-3.259808	
	10% level	-2.771129	

Economy Growth Augmented Dickey-Fuller test 1st Level withTrend and intercept

Null Hypothesis: D(LGDP2) has a unit root
Exogenous: Constant, Linear Trend
Lag Length: 1 (Automatic - based on SIC, maxlag=1)

		t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic		-4.442406	0.0410
Test critical values:	1% level	-5.835186	
	5% level	-4.246503	
	10% level	-3.590496	

Economy Growth Augmented Dickey-Fuller test 2nd Level with intercept

Null Hypothesis: D(LGDP2,2) has a unit root
Exogenous: Constant
Lag Length: 1 (Automatic - based on SIC, maxlag=1)

		t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic		-4.704225	0.0111
Test critical values:	1% level	-4.803492	
	5% level	-3.403313	
	10% level	-2.841819	

Economy Growth Augmented Dickey-Fuller test 2nd Level with Trend and intercept

Null Hypothesis: D(LGDP2,2) has a unit root
Exogenous: Constant, Linear Trend
Lag Length: 1 (Automatic - based on SIC, maxlag=1)

		t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic		-4.875797	0.0344
Test critical values:	1% level	-6.292057	
	5% level	-4.450425	
	10% level	-3.701534	

APPENDIX 4.5.2 Malaysia Augmented Dickey-Fuller test

Corruption Perspective Index Augmented Dickey-Fuller test On Level with intercept

Null Hypothesis: ICPI has a unit root
Exogenous: Constant
Lag Length: 0 (Automatic - based on SIC, maxlag=1)

		t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic		-1.711290	0.3971
Test critical values:	1% level	-4.297073	
	5% level	-3.212696	
	10% level	-2.747676	

*MacKinnon (1996) one-sided p-values.
Warning: Probabilities and critical values calculated for 20 observations
and may not be accurate for a sample size of 10

Augmented Dickey-Fuller Test Equation
Dependent Variable: D(ICPI)
Method: Least Squares
Date: 10/01/20 Time: 20:08
Sample (adjusted): 2008 2017
Included observations: 10 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
ICPI(-1)	-0.505392	0.295328	-1.711290	0.1254
C	1.952434	1.145856	1.703908	0.1268

R-squared	0.267970	Mean dependent var	-0.008168
Adjusted R-squared	0.176466	S.D. dependent var	0.068668
S.E. of regression	0.062315	Akaike info criterion	-2.536369
Sum squared resid	0.031065	Schwarz criterion	-2.475852
Log likelihood	14.68185	Hannan-Quinn criter.	-2.602756
F-statistic	2.928512	Durbin-Watson stat	1.625216
Prob(F-statistic)	0.125391		

Corruption Perspective Index Augmented Dickey-Fuller test On Level with Trend and intercept

Null Hypothesis: ICPI has a unit root
Exogenous: Constant
Lag Length: 0 (Automatic - based on SIC, maxlag=1)

		t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic		-1.711290	0.3971
Test critical values:	1% level	-4.297073	
	5% level	-3.212696	
	10% level	-2.747676	

*MacKinnon (1996) one-sided p-values.

Warning: Probabilities and critical values calculated for 20 observations
and may not be accurate for a sample size of 10

Augmented Dickey-Fuller Test Equation
Dependent Variable: D(ICPI)
Method: Least Squares
Date: 10/01/20 Time: 20:08
Sample (adjusted): 2008 2017
Included observations: 10 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
ICPI(-1)	-0.505392	0.295328	-1.711290	0.1254
C	1.952434	1.145856	1.703908	0.1268

R-squared	0.267970	Mean dependent var	-0.008168
Adjusted R-squared	0.176466	S.D. dependent var	0.068668
S.E. of regression	0.062315	Akaike info criterion	-2.536369
Sum squared resid	0.031065	Schwarz criterion	-2.475852
Log likelihood	14.68185	Hannan-Quinn criter.	-2.602756
F-statistic	2.928512	Durbin-Watson stat	1.625216
Prob(F-statistic)	0.125391		

Corruption Perspective Index Augmented Dickey-Fuller test 1st Level with intercept

Null Hypothesis: D(ICPI) has a unit root
Exogenous: Constant
Lag Length: 0 (Automatic - based on SIC, maxlag=1)

		t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic		-2.460714	0.1537
Test critical values:	1% level	-4.420595	
	5% level	-3.259808	
	10% level	-2.771129	

*MacKinnon (1996) one-sided p-values.
Warning: Probabilities and critical values calculated for 20 observations
and may not be accurate for a sample size of 9

Augmented Dickey-Fuller Test Equation
Dependent Variable: D(ICPI,2)
Method: Least Squares
Date: 10/01/20 Time: 20:14
Sample (adjusted): 2009 2017
Included observations: 9 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
D(ICPI(-1))	-0.941652	0.382674	-2.460714	0.0434
C	-0.008816	0.025944	-0.339806	0.7440

R-squared	0.463812	Mean dependent var	-0.004630

Adjusted R-squared	0.387213	S.D. dependent var	0.099213
S.E. of regression	0.077665	Akaike info criterion	-2.079694
Sum squared resid	0.042223	Schwarz criterion	-2.035867
Log likelihood	11.35863	Hannan-Quinn criter.	-2.174274
F-statistic	6.055111	Durbin-Watson stat	1.626051
Prob(F-statistic)	0.043420		

Corruption Perspective Index Augmented Dickey-Fuller test 1st Level with Trend and intercept

Null Hypothesis: D(ICPI) has a unit root
Exogenous: Constant, Linear Trend
Lag Length: 0 (Automatic - based on SIC, maxlag=1)

		t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic		-2.302446	0.3942
Test critical values:	1% level	-5.521860	
	5% level	-4.107833	
	10% level	-3.515047	

*MacKinnon (1996) one-sided p-values.
Warning: Probabilities and critical values calculated for 20 observations
and may not be accurate for a sample size of 9

Augmented Dickey-Fuller Test Equation
Dependent Variable: D(ICPI,2)
Method: Least Squares
Date: 10/01/20 Time: 20:15
Sample (adjusted): 2009 2017
Included observations: 9 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
D(ICPI(-1))	-0.966195	0.419638	-2.302446	0.0609
C	-0.027614	0.071958	-0.383755	0.7144
@TREND("2007")	0.003115	0.010995	0.283296	0.7865

R-squared	0.470889	Mean dependent var	-0.004630
Adjusted R-squared	0.294519	S.D. dependent var	0.099213
S.E. of regression	0.083332	Akaike info criterion	-1.870760
Sum squared resid	0.041666	Schwarz criterion	-1.805018
Log likelihood	11.41842	Hannan-Quinn criter.	-2.012630
F-statistic	2.669888	Durbin-Watson stat	1.581173
Prob(F-statistic)	0.148129		

Corruption Perspective Index Augmented Dickey-Fuller test 2nd Level with intercept

Null Hypothesis: D(ICPI,2) has a unit root
Exogenous: Constant
Lag Length: 0 (Automatic - based on SIC, maxlag=1)

		t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic		-5.467083	0.0036
Test critical values:	1% level	-4.582648	
	5% level	-3.320969	
	10% level	-2.801384	

*MacKinnon (1996) one-sided p-values.
Warning: Probabilities and critical values calculated for 20 observations
and may not be accurate for a sample size of 8

Augmented Dickey-Fuller Test Equation
Dependent Variable: D(ICPI,3)
Method: Least Squares
Date: 10/01/20 Time: 20:18
Sample (adjusted): 2010 2017
Included observations: 8 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
D(ICPI(-1),2)	-1.556292	0.284666	-5.467083	0.0016
C	0.009031	0.028195	0.320327	0.7596

R-squared	0.832818	Mean dependent var	0.012962
Adjusted R-squared	0.804954	S.D. dependent var	0.180510
S.E. of regression	0.079720	Akaike info criterion	-2.008265
Sum squared resid	0.038132	Schwarz criterion	-1.988404
Log likelihood	10.03306	Hannan-Quinn criter.	-2.142215
F-statistic	29.88900	Durbin-Watson stat	1.371234
Prob(F-statistic)	0.001562		

Corruption Perspective Index Augmented Dickey-Fuller test 2nd Level with Trend and intercept

Null Hypothesis: D(ICPI,2) has a unit root
Exogenous: Constant, Linear Trend
Lag Length: 0 (Automatic - based on SIC, maxlag=1)

		t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic		-6.020970	0.0084
Test critical values:	1% level	-5.835186	
	5% level	-4.246503	
	10% level	-3.590496	

*MacKinnon (1996) one-sided p-values.

Warning: Probabilities and critical values calculated for 20 observations
and may not be accurate for a sample size of 8

Augmented Dickey-Fuller Test Equation
Dependent Variable: D(ICPI,3)
Method: Least Squares
Date: 10/01/20 Time: 20:19
Sample (adjusted): 2010 2017
Included observations: 8 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
D(ICPI(-1),2)	-1.567079	0.260270	-6.020970	0.0018
C	0.117021	0.077496	1.510018	0.1914
@TREND("2007")	-0.016618	0.011247	-1.477550	0.1996

R-squared	0.883629	Mean dependent var	0.012962
Adjusted R-squared	0.837081	S.D. dependent var	0.180510
S.E. of regression	0.072860	Akaike info criterion	-2.120565
Sum squared resid	0.026543	Schwarz criterion	-2.090775
Log likelihood	11.48226	Hannan-Quinn criter.	-2.321491
F-statistic	18.98302	Durbin-Watson stat	1.963798
Prob(F-statistic)	0.004620		

Cashless Payment Cheque Augmented Dickey-Fuller test On Level with intercept

Null Hypothesis: ICHEQUES has a unit root
Exogenous: Constant
Lag Length: 0 (Automatic - based on SIC, maxlag=1)

		t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic		-3.354912	0.0404
Test critical values:	1% level	-4.297073	
	5% level	-3.212696	
	10% level	-2.747676	

*MacKinnon (1996) one-sided p-values.
Warning: Probabilities and critical values calculated for 20 observations
and may not be accurate for a sample size of 10

Augmented Dickey-Fuller Test Equation
Dependent Variable: D(ICHEQUES)
Method: Least Squares
Date: 10/01/20 Time: 20:27
Sample (adjusted): 2008 2017
Included observations: 10 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
ICHEQUES(-1)	-1.167611	0.348030	-3.354912	0.0100

C	16.43110	4.911989	3.345102	0.0102

R-squared	0.584533	Mean dependent var	-0.005927
Adjusted R-squared	0.532600	S.D. dependent var	1.626134
S.E. of regression	1.111734	Akaike info criterion	3.226576
Sum squared resid	9.887627	Schwarz criterion	3.287093
Log likelihood	-14.13288	Hannan-Quinn criter.	3.160189
F-statistic	11.25544	Durbin-Watson stat	2.060263
Prob(F-statistic)	0.010007		

Cashless Payment Cheque Augmented Dickey-Fuller test On Level with Trend and intercept

Null Hypothesis: ICHEQUES has a unit root
Exogenous: Constant, Linear Trend
Lag Length: 0 (Automatic - based on SIC, maxlag=1)

		t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic		-3.161232	0.1473
Test critical values:	1% level	-5.295384	
	5% level	-4.008157	
	10% level	-3.460791	

*MacKinnon (1996) one-sided p-values.
Warning: Probabilities and critical values calculated for 20 observations
and may not be accurate for a sample size of 10

Augmented Dickey-Fuller Test Equation
Dependent Variable: D(ICHEQUES)
Method: Least Squares
Date: 10/01/20 Time: 20:29
Sample (adjusted): 2008 2017
Included observations: 10 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
ICHEQUES(-1)	-1.185278	0.374942	-3.161232	0.0159
C	16.88848	5.457034	3.094809	0.0174
@TREND("2007")	-0.037939	0.131862	-0.287715	0.7819

R-squared	0.589389	Mean dependent var	-0.005927
Adjusted R-squared	0.472071	S.D. dependent var	1.626134
S.E. of regression	1.181528	Akaike info criterion	3.414820
Sum squared resid	9.772065	Schwarz criterion	3.505595
Log likelihood	-14.07410	Hannan-Quinn criter.	3.315239
F-statistic	5.023876	Durbin-Watson stat	2.056240
Prob(F-statistic)	0.044362		

Cashless Payment Cheque Augmented Dickey-Fuller test 1st Level with intercept

Null Hypothesis: D(ICHEQUES) has a unit root
Exogenous: Constant
Lag Length: 0 (Automatic - based on SIC, maxlag=1)

		t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic		-4.666228	0.0072
Test critical values:	1% level	-4.420595	
	5% level	-3.259808	
	10% level	-2.771129	

*MacKinnon (1996) one-sided p-values.
Warning: Probabilities and critical values calculated for 20 observations
and may not be accurate for a sample size of 9

Augmented Dickey-Fuller Test Equation
Dependent Variable: D(ICHEQUES,2)
Method: Least Squares
Date: 10/01/20 Time: 20:31
Sample (adjusted): 2009 2017
Included observations: 9 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
D(ICHEQUES(-1))	-1.513431	0.324337	-4.666228	0.0023
C	-0.011327	0.527410	-0.021477	0.9835

R-squared	0.756722	Mean dependent var	-0.006303
Adjusted R-squared	0.721968	S.D. dependent var	3.000694
S.E. of regression	1.582227	Akaike info criterion	3.948674
Sum squared resid	17.52410	Schwarz criterion	3.992502
Log likelihood	-15.76903	Hannan-Quinn criter.	3.854094
F-statistic	21.77369	Durbin-Watson stat	2.376853
Prob(F-statistic)	0.002298		

Cashless Payment Cheque Augmented Dickey-Fuller test 1st Level with Trend and intercept

Null Hypothesis: D(ICHEQUES) has a unit root
Exogenous: Constant, Linear Trend
Lag Length: 0 (Automatic - based on SIC, maxlag=1)

		t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic		-4.364485	0.0372
Test critical values:	1% level	-5.521860	
	5% level	-4.107833	
	10% level	-3.515047	

*MacKinnon (1996) one-sided p-values.
Warning: Probabilities and critical values calculated for 20 observations
and may not be accurate for a sample size of 9

Augmented Dickey-Fuller Test Equation
Dependent Variable: D(ICHEQUES,2)
Method: Least Squares
Date: 10/01/20 Time: 20:31
Sample (adjusted): 2009 2017
Included observations: 9 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
D(ICHEQUES(-1))	-1.520830	0.348456	-4.364485	0.0047
C	-0.414630	1.433005	-0.289343	0.7821
@TREND("2007")	0.067213	0.219454	0.306273	0.7697

R-squared	0.760467	Mean dependent var	-0.006303
Adjusted R-squared	0.680623	S.D. dependent var	3.000694
S.E. of regression	1.695796	Akaike info criterion	4.155383
Sum squared resid	17.25435	Schwarz criterion	4.221125
Log likelihood	-15.69923	Hannan-Quinn criter.	4.013513
F-statistic	9.524371	Durbin-Watson stat	2.407087
Prob(F-statistic)	0.013743		

Cashless Payment Card and E-money Augmented Dickey-Fuller test On Level with intercept

Null Hypothesis: ICARD has a unit root
Exogenous: Constant
Lag Length: 1 (Automatic - based on SIC, maxlag=1)

		t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic		-2.092593	0.2503
Test critical values:	1% level	-4.420595	
	5% level	-3.259808	
	10% level	-2.771129	

*MacKinnon (1996) one-sided p-values.
Warning: Probabilities and critical values calculated for 20 observations
and may not be accurate for a sample size of 9

Augmented Dickey-Fuller Test Equation
Dependent Variable: D(ICARD)
Method: Least Squares
Date: 10/01/20 Time: 20:21
Sample (adjusted): 2009 2017
Included observations: 9 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
ICARD(-1)	-0.084978	0.040609	-2.092593	0.0813
D(ICARD(-1))	-0.501220	0.315718	-1.587554	0.1635
C	1.138022	0.493722	2.304985	0.0607

R-squared	0.427054	Mean dependent var	0.098618
Adjusted R-squared	0.236072	S.D. dependent var	0.027398

S.E. of regression	0.023946	Akaike info criterion	-4.364790
Sum squared resid	0.003441	Schwarz criterion	-4.299049
Log likelihood	22.64156	Hannan-Quinn criter.	-4.506660
F-statistic	2.236092	Durbin-Watson stat	1.591539
Prob(F-statistic)	0.188080		

Cashless Payment Card and E-money Augmented Dickey-Fuller test On Level with Trend and intercept

Null Hypothesis: ICARD has a unit root
Exogenous: Constant, Linear Trend
Lag Length: 0 (Automatic - based on SIC, maxlag=1)

		t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic		-2.150967	0.4624
Test critical values:	1% level	-5.295384	
	5% level	-4.008157	
	10% level	-3.460791	

*MacKinnon (1996) one-sided p-values.
Warning: Probabilities and critical values calculated for 20 observations
and may not be accurate for a sample size of 10

Augmented Dickey-Fuller Test Equation
Dependent Variable: D(ICARD)
Method: Least Squares
Date: 10/01/20 Time: 20:23
Sample (adjusted): 2008 2017
Included observations: 10 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
ICARD(-1)	-0.470539	0.218757	-2.150967	0.0685
C	5.306299	2.401705	2.209388	0.0629
@TREND("2007")	0.042596	0.022930	1.857696	0.1056

R-squared	0.603567	Mean dependent var	0.105204
Adjusted R-squared	0.490300	S.D. dependent var	0.033179
S.E. of regression	0.023688	Akaike info criterion	-4.404383
Sum squared resid	0.003928	Schwarz criterion	-4.313607
Log likelihood	25.02191	Hannan-Quinn criter.	-4.503963
F-statistic	5.328729	Durbin-Watson stat	2.432087
Prob(F-statistic)	0.039228		

Cashless Payment Card and E-money Augmented Dickey-Fuller test 1st Level with intercept

Null Hypothesis: D(ICARD) has a unit root
Exogenous: Constant
Lag Length: 0 (Automatic - based on SIC, maxlag=1)

		t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic		-3.663909	0.0283
Test critical values:	1% level	-4.420595	
	5% level	-3.259808	
	10% level	-2.771129	

*MacKinnon (1996) one-sided p-values.
Warning: Probabilities and critical values calculated for 20 observations
and may not be accurate for a sample size of 9

Augmented Dickey-Fuller Test Equation
Dependent Variable: D(ICARD,2)
Method: Least Squares
Date: 10/01/20 Time: 20:23
Sample (adjusted): 2009 2017
Included observations: 9 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
D(ICARD(-1))	-1.073472	0.292986	-3.663909	0.0080
C	0.106362	0.032371	3.285724	0.0134

R-squared	0.657270	Mean dependent var	-0.006770
Adjusted R-squared	0.608308	S.D. dependent var	0.046590
S.E. of regression	0.029159	Akaike info criterion	-4.038993
Sum squared resid	0.005952	Schwarz criterion	-3.995165
Log likelihood	20.17547	Hannan-Quinn criter.	-4.133573
F-statistic	13.42423	Durbin-Watson stat	1.588538
Prob(F-statistic)	0.008029		

Cashless Payment Card and E-money Augmented Dickey-Fuller test 1st Level with Trend and intercept

Null Hypothesis: D(ICARD) has a unit root
Exogenous: Constant, Linear Trend
Lag Length: 0 (Automatic - based on SIC, maxlag=1)

		t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic		-4.449183	0.0337
Test critical values:	1% level	-5.521860	
	5% level	-4.107833	
	10% level	-3.515047	

*MacKinnon (1996) one-sided p-values.
Warning: Probabilities and critical values calculated for 20 observations
and may not be accurate for a sample size of 9

Augmented Dickey-Fuller Test Equation

Dependent Variable: D(ICARD,2)
Method: Least Squares
Date: 10/01/20 Time: 20:26
Sample (adjusted): 2009 2017
Included observations: 9 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
D(ICARD(-1))	-1.507525	0.338832	-4.449183	0.0043
C	0.201705	0.057313	3.519368	0.0125
@TREND("2007")	-0.008267	0.004353	-1.898856	0.1063

R-squared	0.785920	Mean dependent var	-0.006770
Adjusted R-squared	0.714560	S.D. dependent var	0.046590
S.E. of regression	0.024892	Akaike info criterion	-4.287363
Sum squared resid	0.003718	Schwarz criterion	-4.221621
Log likelihood	22.29313	Hannan-Quinn criter.	-4.429233
F-statistic	11.01343	Durbin-Watson stat	1.556683
Prob(F-statistic)	0.009811		

Cashless Payment Direct Debit Augmented Dickey-Fuller test On Level with intercept

Null Hypothesis: IDIRECT has a unit root
Exogenous: Constant
Lag Length: 0 (Automatic - based on SIC, maxlag=1)

		t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic		0.838177	0.9884
Test critical values:	1% level	-4.297073	
	5% level	-3.212696	
	10% level	-2.747676	

*MacKinnon (1996) one-sided p-values.
Warning: Probabilities and critical values calculated for 20 observations
and may not be accurate for a sample size of 10

Augmented Dickey-Fuller Test Equation
Dependent Variable: D(IDIRECT)
Method: Least Squares
Date: 10/01/20 Time: 20:36
Sample (adjusted): 2008 2017
Included observations: 10 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
IDIRECT(-1)	0.090505	0.107979	0.838177	0.4263
C	-0.624167	0.975838	-0.639622	0.5403

R-squared	0.080728	Mean dependent var	0.191682

Adjusted R-squared	-0.034181	S.D. dependent var	0.216058
S.E. of regression	0.219719	Akaike info criterion	-0.016078
Sum squared resid	0.386212	Schwarz criterion	0.044439
Log likelihood	2.080391	Hannan-Quinn criter.	-0.082465
F-statistic	0.702541	Durbin-Watson stat	1.276344
Prob(F-statistic)	0.426263		

Cashless Payment Direct Debit Augmented Dickey-Fuller test On Level with Trend and intercept

Null Hypothesis: IDIRECT has a unit root
Exogenous: Constant, Linear Trend
Lag Length: 1 (Automatic - based on SIC, maxlag=1)

		t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic		-3.225146	0.1426
Test critical values:	1% level	-5.521860	
	5% level	-4.107833	
	10% level	-3.515047	

*MacKinnon (1996) one-sided p-values.
Warning: Probabilities and critical values calculated for 20 observations
and may not be accurate for a sample size of 9

Augmented Dickey-Fuller Test Equation
Dependent Variable: D(IDIRECT)
Method: Least Squares
Date: 10/01/20 Time: 20:37
Sample (adjusted): 2009 2017
Included observations: 9 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
IDIRECT(-1)	-0.663426	0.205704	-3.225146	0.0233
D(IDIRECT(-1))	0.416935	0.260238	1.602132	0.1700
C	5.086483	1.585054	3.209028	0.0238
@TREND("2007")	0.177167	0.050841	3.484747	0.0176

R-squared	0.768812	Mean dependent var	0.205796
Adjusted R-squared	0.630100	S.D. dependent var	0.224220
S.E. of regression	0.136370	Akaike info criterion	-0.845794
Sum squared resid	0.092983	Schwarz criterion	-0.758139
Log likelihood	7.806073	Hannan-Quinn criter.	-1.034954
F-statistic	5.542485	Durbin-Watson stat	2.739142
Prob(F-statistic)	0.047815		

Cashless Payment Direct Debit Augmented Dickey-Fuller test 1st Level with intercept

Null Hypothesis: D(IDIRECT) has a unit root

Exogenous: Constant
Lag Length: 0 (Automatic - based on SIC, maxlag=1)

		t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic		-1.677658	0.4086
Test critical values:	1% level	-4.420595	
	5% level	-3.259808	
	10% level	-2.771129	

*MacKinnon (1996) one-sided p-values.
Warning: Probabilities and critical values calculated for 20 observations
and may not be accurate for a sample size of 9

Augmented Dickey-Fuller Test Equation
Dependent Variable: D(IDIRECT,2)
Method: Least Squares
Date: 10/01/20 Time: 20:38
Sample (adjusted): 2009 2017
Included observations: 9 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
D(IDIRECT(-1))	-0.554284	0.330392	-1.677658	0.1373
C	0.122651	0.094156	1.302646	0.2339

R-squared	0.286772	Mean dependent var	0.019254
Adjusted R-squared	0.184883	S.D. dependent var	0.236525
S.E. of regression	0.213544	Akaike info criterion	-0.056818
Sum squared resid	0.319207	Schwarz criterion	-0.012991
Log likelihood	2.255682	Hannan-Quinn criter.	-0.151398
F-statistic	2.814537	Durbin-Watson stat	1.686460
Prob(F-statistic)	0.137313		

Cashless Payment Direct Debit Augmented Dickey-Fuller test 1st Level with Trend and intercept

Null Hypothesis: D(IDIRECT) has a unit root
Exogenous: Constant, Linear Trend
Lag Length: 1 (Automatic - based on SIC, maxlag=1)

		t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic		-2.139909	0.4552
Test critical values:	1% level	-5.835186	
	5% level	-4.246503	
	10% level	-3.590496	

*MacKinnon (1996) one-sided p-values.
Warning: Probabilities and critical values calculated for 20 observations
and may not be accurate for a sample size of 8

Augmented Dickey-Fuller Test Equation
Dependent Variable: D(IDIRECT,2)
Method: Least Squares
Date: 10/01/20 Time: 20:39
Sample (adjusted): 2010 2017
Included observations: 8 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
D(IDIRECT(-1))	-1.169652	0.546589	-2.139909	0.0991
D(IDIRECT(-1),2)	0.559626	0.432631	1.293542	0.2655
C	-0.032453	0.253463	-0.128038	0.9043
@TREND("2007")	0.044223	0.045811	0.965343	0.3890

R-squared	0.555438	Mean dependent var	0.033136
Adjusted R-squared	0.222017	S.D. dependent var	0.248906
S.E. of regression	0.219543	Akaike info criterion	0.112316
Sum squared resid	0.192797	Schwarz criterion	0.152036
Log likelihood	3.550738	Hannan-Quinn criter.	-0.155585
F-statistic	1.665876	Durbin-Watson stat	1.721598
Prob(F-statistic)	0.310001		

Cashless Payment Direct Debit Augmented Dickey-Fuller test 2nd Level with intercept

Null Hypothesis: D(IDIRECT,2) has a unit root
Exogenous: Constant
Lag Length: 1 (Automatic - based on SIC, maxlag=1)

		t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic		-3.408580	0.0497
Test critical values:	1% level	-4.803492	
	5% level	-3.403313	
	10% level	-2.841819	

*MacKinnon (1996) one-sided p-values.
Warning: Probabilities and critical values calculated for 20 observations
and may not be accurate for a sample size of 7

Augmented Dickey-Fuller Test Equation
Dependent Variable: D(IDIRECT,3)
Method: Least Squares
Date: 10/01/20 Time: 20:40
Sample (adjusted): 2011 2017
Included observations: 7 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
D(IDIRECT(-1),2)	-1.696638	0.497755	-3.408580	0.0271
D(IDIRECT(-1),3)	0.561200	0.342817	1.637024	0.1770
C	0.092792	0.088155	1.052599	0.3519

R-squared	0.763499	Mean dependent var	0.028865
Adjusted R-squared	0.645249	S.D. dependent var	0.383359
S.E. of regression	0.228332	Akaike info criterion	0.181498

Sum squared resid	0.208543	Schwarz criterion	0.158317
Log likelihood	2.364755	Hannan-Quinn criter.	-0.105019
F-statistic	6.456639	Durbin-Watson stat	0.592220
Prob(F-statistic)	0.055933		

Cashless Payment Direct Debit Augmented Dickey-Fuller test 2nd Level with Trend and intercept

Null Hypothesis: D(IDIRECT,2) has a unit root
Exogenous: Constant, Linear Trend
Lag Length: 1 (Automatic - based on SIC, maxlag=1)

		t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic		-6.749036	0.0073
Test critical values:	1% level	-6.292057	
	5% level	-4.450425	
	10% level	-3.701534	

*MacKinnon (1996) one-sided p-values.
Warning: Probabilities and critical values calculated for 20 observations
and may not be accurate for a sample size of 7

Augmented Dickey-Fuller Test Equation
Dependent Variable: D(IDIRECT,3)
Method: Least Squares
Date: 10/01/20 Time: 20:40
Sample (adjusted): 2011 2017
Included observations: 7 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
D(IDIRECT(-1),2)	-1.835108	0.271907	-6.749036	0.0066
D(IDIRECT(-1),3)	0.580330	0.185086	3.135463	0.0518
C	0.642512	0.174384	3.684473	0.0346
@TREND("2007")	-0.077736	0.023724	-3.276635	0.0465

R-squared	0.948349	Mean dependent var	0.028865
Adjusted R-squared	0.896697	S.D. dependent var	0.383359
S.E. of regression	0.123215	Akaike info criterion	-1.054220
Sum squared resid	0.045545	Schwarz criterion	-1.085128
Log likelihood	7.689769	Hannan-Quinn criter.	-1.436243
F-statistic	18.36054	Durbin-Watson stat	1.539620
Prob(F-statistic)	0.019617		

Government Size Augmented Dickey-Fuller test On Level with intercept

Null Hypothesis: IGOV has a unit root
Exogenous: Constant
Lag Length: 0 (Automatic - based on SIC, maxlag=1)

	t-Statistic	Prob.*

		t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic		-1.862661	0.3337
Test critical values:	1% level	-4.297073	
	5% level	-3.212696	
	10% level	-2.747676	

*MacKinnon (1996) one-sided p-values.
Warning: Probabilities and critical values calculated for 20 observations
and may not be accurate for a sample size of 10

Augmented Dickey-Fuller Test Equation
Dependent Variable: D(IGOV)
Method: Least Squares
Date: 10/01/20 Time: 20:44
Sample (adjusted): 2008 2017
Included observations: 10 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
IGOV(-1)	-0.456382	0.245016	-1.862661	0.0995
C	1.169666	0.625361	1.870387	0.0983

R-squared	0.302498	Mean dependent var	0.005162
Adjusted R-squared	0.215311	S.D. dependent var	0.053159
S.E. of regression	0.047090	Akaike info criterion	-3.096655
Sum squared resid	0.017740	Schwarz criterion	-3.036138
Log likelihood	17.48328	Hannan-Quinn criter.	-3.163042
F-statistic	3.469505	Durbin-Watson stat	2.015525
Prob(F-statistic)	0.099523		

Government Size Augmented Dickey-Fuller test On Level with Trend and intercept

Null Hypothesis: IGOV has a unit root
Exogenous: Constant, Linear Trend
Lag Length: 1 (Automatic - based on SIC, maxlag=1)

		t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic		-0.875115	0.9079
Test critical values:	1% level	-5.521860	
	5% level	-4.107833	
	10% level	-3.515047	

*MacKinnon (1996) one-sided p-values.
Warning: Probabilities and critical values calculated for 20 observations
and may not be accurate for a sample size of 9

Augmented Dickey-Fuller Test Equation
Dependent Variable: D(IGOV)
Method: Least Squares
Date: 10/01/20 Time: 20:44
Sample (adjusted): 2009 2017
Included observations: 9 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
IGOV(-1)	-0.225610	0.257806	-0.875115	0.4216
D(IGOV(-1))	-0.530982	0.280118	-1.895565	0.1165
C	0.696433	0.636231	1.094622	0.3236
@TREND("2007")	-0.017826	0.005951	-2.995681	0.0302

R-squared	0.827822	Mean dependent var	0.006333
Adjusted R-squared	0.724515	S.D. dependent var	0.056247
S.E. of regression	0.029522	Akaike info criterion	-3.906249
Sum squared resid	0.004358	Schwarz criterion	-3.818593
Log likelihood	21.57812	Hannan-Quinn criter.	-4.095409
F-statistic	8.013222	Durbin-Watson stat	2.011864
Prob(F-statistic)	0.023463		

Government Size Augmented Dickey-Fuller test 1st Level with intercept

Null Hypothesis: D(IGOV) has a unit root
Exogenous: Constant
Lag Length: 0 (Automatic - based on SIC, maxlag=1)

		t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic		-2.928226	0.0799
Test critical values:	1% level	-4.420595	
	5% level	-3.259808	
	10% level	-2.771129	

*MacKinnon (1996) one-sided p-values.
Warning: Probabilities and critical values calculated for 20 observations
and may not be accurate for a sample size of 9

Augmented Dickey-Fuller Test Equation
Dependent Variable: D(IGOV,2)
Method: Least Squares
Date: 10/01/20 Time: 20:46
Sample (adjusted): 2009 2017
Included observations: 9 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
D(IGOV(-1))	-1.128394	0.385351	-2.928226	0.0221
C	0.007514	0.020200	0.371973	0.7209

R-squared	0.550548	Mean dependent var	-0.002863
Adjusted R-squared	0.486340	S.D. dependent var	0.083242
S.E. of regression	0.059659	Akaike info criterion	-2.607203
Sum squared resid	0.024915	Schwarz criterion	-2.563375
Log likelihood	13.73241	Hannan-Quinn criter.	-2.701783
F-statistic	8.574510	Durbin-Watson stat	1.201880
Prob(F-statistic)	0.022080		

Government Size Augmented Dickey-Fuller test 1st Level with Trend and intercept

Null Hypothesis: D(IGOV) has a unit root
Exogenous: Constant, Linear Trend
Lag Length: 0 (Automatic - based on SIC, maxlag=1)

		t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic		-7.687249	0.0013
Test critical values:	1% level	-5.521860	
	5% level	-4.107833	
	10% level	-3.515047	

*MacKinnon (1996) one-sided p-values.
Warning: Probabilities and critical values calculated for 20 observations
and may not be accurate for a sample size of 9

Democracy Index Augmented Dickey-Fuller test On Level with intercept

Augmented Dickey-Fuller Test Equation
Dependent Variable: D(IGOV,2)
Method: Least Squares
Date: 10/01/20 Time: 20:46
Sample (adjusted): 2009 2017
Included observations: 9 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
D(IGOV(-1))	-1.679482	0.218476	-7.687249	0.0003
C	0.140257	0.028949	4.845023	0.0029
@TREND("2007")	-0.021279	0.004367	-4.873122	0.0028

R-squared	0.909346	Mean dependent var	-0.002863
Adjusted R-squared	0.879128	S.D. dependent var	0.083242
S.E. of regression	0.028940	Akaike info criterion	-3.985960
Sum squared resid	0.005025	Schwarz criterion	-3.920219
Log likelihood	20.93682	Hannan-Quinn criter.	-4.127830
F-statistic	30.09285	Durbin-Watson stat	2.164652
Prob(F-statistic)	0.000745		

Null Hypothesis: D(ICHEQUES) has a unit root
Exogenous: Constant, Linear Trend
Lag Length: 0 (Automatic - based on SIC, maxlag=1)

		t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic		-4.364485	0.0372
Test critical values:	1% level	-5.521860	
	5% level	-4.107833	
	10% level	-3.515047	

*MacKinnon (1996) one-sided p-values.
Warning: Probabilities and critical values calculated for 20 observations
and may not be accurate for a sample size of 9

Augmented Dickey-Fuller Test Equation
Dependent Variable: D(ICHEQUES,2)
Method: Least Squares
Date: 10/01/20 Time: 20:31
Sample (adjusted): 2009 2017
Included observations: 9 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
D(ICHEQUES(-1))	-1.520830	0.348456	-4.364485	0.0047
C	-0.414630	1.433005	-0.289343	0.7821
@TREND("2007")	0.067213	0.219454	0.306273	0.7697

R-squared	0.760467	Mean dependent var	-0.006303
Adjusted R-squared	0.680623	S.D. dependent var	3.000694
S.E. of regression	1.695796	Akaike info criterion	4.155383
Sum squared resid	17.25435	Schwarz criterion	4.221125
Log likelihood	-15.69923	Hannan-Quinn criter.	4.013513
F-statistic	9.524371	Durbin-Watson stat	2.407087
Prob(F-statistic)	0.013743		

Democracy Index Augmented Dickey-Fuller test On Level with Trend and intercept

Null Hypothesis: IDACL has a unit root
Exogenous: Constant, Linear Trend
Lag Length: 1 (Automatic - based on SIC, maxlag=1)

		t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic		-2.727684	0.2537
Test critical values:	1% level	-5.521860	
	5% level	-4.107833	
	10% level	-3.515047	

*MacKinnon (1996) one-sided p-values.
Warning: Probabilities and critical values calculated for 20 observations
and may not be accurate for a sample size of 9

Augmented Dickey-Fuller Test Equation
Dependent Variable: D(IDACL)
Method: Least Squares
Date: 10/01/20 Time: 20:34
Sample (adjusted): 2009 2017
Included observations: 9 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
IDACL(-1)	-0.501335	0.183795	-2.727684	0.0414
D(IDACL(-1))	-0.237009	0.140545	-1.686357	0.1525
C	1.734921	0.619095	2.802352	0.0379
@TREND("2007")	-0.011450	0.001706	-6.713088	0.0011

R-squared	0.927805	Mean dependent var	-0.004193
Adjusted R-squared	0.884488	S.D. dependent var	0.033404
S.E. of regression	0.011353	Akaike info criterion	-5.817582
Sum squared resid	0.000644	Schwarz criterion	-5.729926
Log likelihood	30.17912	Hannan-Quinn criter.	-6.006742
F-statistic	21.41904	Durbin-Watson stat	3.517868
Prob(F-statistic)	0.002778		

Democracy Index Augmented Dickey-Fuller test 1stLevel with intercept

Null Hypothesis: D(IDACL) has a unit root
Exogenous: Constant
Lag Length: 0 (Automatic - based on SIC, maxlag=1)

		t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic		-5.218459	0.0036
Test critical values:	1% level	-4.420595	
	5% level	-3.259808	
	10% level	-2.771129	

*MacKinnon (1996) one-sided p-values.
Warning: Probabilities and critical values calculated for 20 observations
and may not be accurate for a sample size of 9

Augmented Dickey-Fuller Test Equation
Dependent Variable: D(IDACL,2)
Method: Least Squares
Date: 10/01/20 Time: 20:35
Sample (adjusted): 2009 2017
Included observations: 9 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
D(IDACL(-1))	-1.443140	0.276545	-5.218459	0.0012
C	-0.007712	0.010416	-0.740411	0.4831

R-squared	0.795515	Mean dependent var	0.003747
Adjusted R-squared	0.766303	S.D. dependent var	0.063184
S.E. of regression	0.030545	Akaike info criterion	-3.946124
Sum squared resid	0.006531	Schwarz criterion	-3.902296
Log likelihood	19.75756	Hannan-Quinn criter.	-4.040704
F-statistic	27.23232	Durbin-Watson stat	0.611430
Prob(F-statistic)	0.001228		

Democracy Index Augmented Dickey-Fuller test 1st Level with Trend and intercept

Null Hypothesis: D(IDACL) has a unit root
Exogenous: Constant, Linear Trend
Lag Length: 0 (Automatic - based on SIC, maxlag=1)

		t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic		-10.08035	0.0002
Test critical values:	1% level	-5.521860	
	5% level	-4.107833	
	10% level	-3.515047	

*MacKinnon (1996) one-sided p-values.
Warning: Probabilities and critical values calculated for 20 observations
and may not be accurate for a sample size of 9

Augmented Dickey-Fuller Test Equation
Dependent Variable: D(IDACL,2)
Method: Least Squares
Date: 10/01/20 Time: 20:35
Sample (adjusted): 2009 2017
Included observations: 9 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
D(IDACL(-1))	-1.497367	0.148543	-10.08035	0.0001
C	0.046428	0.013786	3.367889	0.0151
@TREND("2007")	-0.009095	0.002118	-4.294014	0.0051

R-squared	0.949796	Mean dependent var	0.003747
Adjusted R-squared	0.933061	S.D. dependent var	0.063184
S.E. of regression	0.016347	Akaike info criterion	-5.128304
Sum squared resid	0.001603	Schwarz criterion	-5.062563
Log likelihood	26.07737	Hannan-Quinn criter.	-5.270174
F-statistic	56.75631	Durbin-Watson stat	1.999397
Prob(F-statistic)	0.000127		

Economy Growth Augmented Dickey-Fuller test On Level with intercept

Null Hypothesis: IGDP has a unit root
Exogenous: Constant
Lag Length: 0 (Automatic - based on SIC, maxlag=1)

		t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic		-1.991861	0.2849
Test critical values:	1% level	-4.297073	
	5% level	-3.212696	
	10% level	-2.747676	

*MacKinnon (1996) one-sided p-values.
Warning: Probabilities and critical values calculated for 20 observations
and may not be accurate for a sample size of 10

Augmented Dickey-Fuller Test Equation
Dependent Variable: D(IGDP)
Method: Least Squares
Date: 10/01/20 Time: 20:41
Sample (adjusted): 2008 2017
Included observations: 10 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
IGDP(-1)	-0.412539	0.207112	-1.991861	0.0815
C	3.809907	1.895556	2.009916	0.0793

R-squared	0.331524	Mean dependent var	0.034759
Adjusted R-squared	0.247964	S.D. dependent var	0.116526
S.E. of regression	0.101052	Akaike info criterion	-1.569515
Sum squared resid	0.081691	Schwarz criterion	-1.508998
Log likelihood	9.847577	Hannan-Quinn criter.	-1.635902
F-statistic	3.967512	Durbin-Watson stat	2.219419
Prob(F-statistic)	0.081538		

Economy Growth Augmented Dickey-Fuller test On Level with Trend and intercept

Null Hypothesis: IGDP has a unit root
Exogenous: Constant, Linear Trend
Lag Length: 0 (Automatic - based on SIC, maxlag=1)

		t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic		-1.614683	0.7130
Test critical values:	1% level	-5.295384	
	5% level	-4.008157	
	10% level	-3.460791	

*MacKinnon (1996) one-sided p-values.
Warning: Probabilities and critical values calculated for 20 observations
and may not be accurate for a sample size of 10

Augmented Dickey-Fuller Test Equation
Dependent Variable: D(IGDP)
Method: Least Squares
Date: 10/01/20 Time: 20:41
Sample (adjusted): 2008 2017
Included observations: 10 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
IGDP(-1)	-0.535051	0.331366	-1.614683	0.1504
C	4.883006	2.959417	1.649989	0.1429
@TREND("2007")	0.008729	0.017800	0.490408	0.6388

R-squared	0.353728	Mean dependent var	0.034759
Adjusted R-squared	0.169078	S.D. dependent var	0.116526
S.E. of regression	0.106219	Akaike info criterion	-1.403296
Sum squared resid	0.078978	Schwarz criterion	-1.312520
Log likelihood	10.01648	Hannan-Quinn criter.	-1.502876
F-statistic	1.915673	Durbin-Watson stat	2.008761
Prob(F-statistic)	0.216997		

Economy Growth Augmented Dickey-Fuller test 1st Level with intercept

Null Hypothesis: D(IGDP) has a unit root
Exogenous: Constant
Lag Length: 0 (Automatic - based on SIC, maxlag=1)

		t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic		-3.626476	0.0298
Test critical values:	1% level	-4.420595	
	5% level	-3.259808	
	10% level	-2.771129	

*MacKinnon (1996) one-sided p-values.
Warning: Probabilities and critical values calculated for 20 observations
and may not be accurate for a sample size of 9

Augmented Dickey-Fuller Test Equation
Dependent Variable: D(IGDP,2)
Method: Least Squares
Date: 10/01/20 Time: 20:42
Sample (adjusted): 2009 2017
Included observations: 9 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
D(IGDP(-1))	-1.233736	0.340203	-3.626476	0.0084
C	0.029077	0.041262	0.704698	0.5038

R-squared	0.652628	Mean dependent var	-0.012608
Adjusted R-squared	0.603004	S.D. dependent var	0.188685
S.E. of regression	0.118886	Akaike info criterion	-1.228169
Sum squared resid	0.098938	Schwarz criterion	-1.184342
Log likelihood	7.526762	Hannan-Quinn criter.	-1.322749
F-statistic	13.15133	Durbin-Watson stat	1.413737
Prob(F-statistic)	0.008437		

Economy Growth Augmented Dickey-Fuller test 1st Level with Trend and intercept

Null Hypothesis: D(IGDP) has a unit root
Exogenous: Constant, Linear Trend
Lag Length: 1 (Automatic - based on SIC, maxlag=1)

		t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic		-4.226391	0.0514
Test critical values:	1% level	-5.835186	
	5% level	-4.246503	
	10% level	-3.590496	

*MacKinnon (1996) one-sided p-values.
Warning: Probabilities and critical values calculated for 20 observations
and may not be accurate for a sample size of 8

Augmented Dickey-Fuller Test Equation
Dependent Variable: D(IGDP,2)
Method: Least Squares
Date: 10/01/20 Time: 20:43
Sample (adjusted): 2010 2017
Included observations: 8 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
D(IGDP(-1))	-1.740119	0.411727	-4.226391	0.0134
D(IGDP(-1),2)	0.374137	0.244676	1.529107	0.2010
C	0.337659	0.095971	3.518328	0.0245
@TREND("2007")	-0.042069	0.013130	-3.204136	0.0328

R-squared	0.891688	Mean dependent var	0.024216
Adjusted R-squared	0.810454	S.D. dependent var	0.163526
S.E. of regression	0.071194	Akaike info criterion	-2.139959
Sum squared resid	0.020274	Schwarz criterion	-2.100238
Log likelihood	12.55983	Hannan-Quinn criter.	-2.407859
F-statistic	10.97678	Durbin-Watson stat	1.846251
Prob(F-statistic)	0.021186		

APPENDIX 4.5.3 Thailand Augmented Dickey-Fuller test

Corruption Perspective Index Augmented Dickey-Fuller test On Level with intercept

Null Hypothesis: LCPI has a unit root
Exogenous: Constant
Lag Length: 1 (Automatic - based on SIC, maxlag=1)

		t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic		-1.292117	0.5831
Test critical values:	1% level	-4.420595	
	5% level	-3.259808	
	10% level	-2.771129	

*MacKinnon (1996) one-sided p-values.
Warning: Probabilities and critical values calculated for 20 observations
and may not be accurate for a sample size of 9

Augmented Dickey-Fuller Test Equation
Dependent Variable: D(LCPI)
Method: Least Squares
Date: 10/01/20 Time: 21:43
Sample (adjusted): 2009 2017
Included observations: 9 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
LCPI(-1)	-0.566785	0.438648	-1.292117	0.2438
D(LCPI(-1))	-0.449245	0.317428	-1.415267	0.2067
C	2.034437	1.566339	1.298849	0.2417

R-squared	0.586249	Mean dependent var	0.006174
Adjusted R-squared	0.448332	S.D. dependent var	0.060239
S.E. of regression	0.044742	Akaike info criterion	-3.114600
Sum squared resid	0.012011	Schwarz criterion	-3.048858
Log likelihood	17.01570	Hannan-Quinn criter.	-3.256470
F-statistic	4.250732	Durbin-Watson stat	2.223859
Prob(F-statistic)	0.070830		

Corruption Perspective Index Augmented Dickey-Fuller test On Level with Trend and intercept

Null Hypothesis: LCPI has a unit root
Exogenous: Constant, Linear Trend
Lag Length: 0 (Automatic - based on SIC, maxlag=1)

		t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic		-4.139329	0.0426
Test critical values:	1% level	-5.295384	
	5% level	-4.008157	
	10% level	-3.460791	

*MacKinnon (1996) one-sided p-values.
Warning: Probabilities and critical values calculated for 20 observations
and may not be accurate for a sample size of 10

Augmented Dickey-Fuller Test Equation
Dependent Variable: D(LCPI)
Method: Least Squares
Date: 10/01/20 Time: 21:43
Sample (adjusted): 2008 2017
Included observations: 10 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
LCPI(-1)	-1.389447	0.335670	-4.139329	0.0044
C	4.896676	1.177608	4.158154	0.0043
@TREND("2007")	0.012559	0.005316	2.362574	0.0502

R-squared	0.713439	Mean dependent var	0.011441
Adjusted R-squared	0.631564	S.D. dependent var	0.059185
S.E. of regression	0.035925	Akaike info criterion	-3.571446
Sum squared resid	0.009034	Schwarz criterion	-3.480670
Log likelihood	20.85723	Hannan-Quinn criter.	-3.671026
F-statistic	8.713790	Durbin-Watson stat	1.993243
Prob(F-statistic)	0.012597		

Corruption Perspective Index Augmented Dickey-Fuller test 1st Level with intercept

Null Hypothesis: D(LCPI) has a unit root
Exogenous: Constant
Lag Length: 0 (Automatic - based on SIC, maxlag=1)

		t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic		-6.155930	0.0012
Test critical values:	1% level	-4.420595	
	5% level	-3.259808	
	10% level	-2.771129	

*MacKinnon (1996) one-sided p-values.
Warning: Probabilities and critical values calculated for 20 observations
and may not be accurate for a sample size of 9

Augmented Dickey-Fuller Test Equation
Dependent Variable: D(LCPI,2)
Method: Least Squares
Date: 10/01/20 Time: 21:44
Sample (adjusted): 2009 2017
Included observations: 9 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
D(LCPI(-1))	-1.682481	0.273311	-6.155930	0.0005
C	0.010636	0.015713	0.676917	0.5202

R-squared	0.844082	Mean dependent var	-0.000363
Adjusted R-squared	0.821808	S.D. dependent var	0.110945

S.E. of regression	0.046833	Akaike info criterion	-3.091321
Sum squared resid	0.015353	Schwarz criterion	-3.047494
Log likelihood	15.91095	Hannan-Quinn criter.	-3.185901
F-statistic	37.89547	Durbin-Watson stat	2.440720
Prob(F-statistic)	0.000465		

Corruption Perspective Index Augmented Dickey-Fuller test 1st Level with Trend and intercept

Null Hypothesis: D(LCPI) has a unit root
Exogenous: Constant, Linear Trend
Lag Length: 0 (Automatic - based on SIC, maxlag=1)

		t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic		-5.761894	0.0078
Test critical values:	1% level	-5.521860	
	5% level	-4.107833	
	10% level	-3.515047	

*MacKinnon (1996) one-sided p-values.
Warning: Probabilities and critical values calculated for 20 observations
and may not be accurate for a sample size of 9

Augmented Dickey-Fuller Test Equation
Dependent Variable: D(LCPI,2)
Method: Least Squares
Date: 10/01/20 Time: 21:45
Sample (adjusted): 2009 2017
Included observations: 9 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
D(LCPI(-1))	-1.734777	0.301078	-5.761894	0.0012
C	0.034160	0.043786	0.780160	0.4650
@TREND("2007")	-0.003864	0.006660	-0.580087	0.5830

R-squared	0.852362	Mean dependent var	-0.000363
Adjusted R-squared	0.803150	S.D. dependent var	0.110945
S.E. of regression	0.049224	Akaike info criterion	-2.923666
Sum squared resid	0.014538	Schwarz criterion	-2.857925
Log likelihood	16.15650	Hannan-Quinn criter.	-3.065536
F-statistic	17.32001	Durbin-Watson stat	2.504891
Prob(F-statistic)	0.003218		

Cashless Payment Cheque Augmented Dickey-Fuller test On Level with intercept

Null Hypothesis: LCHEQUES has a unit root
Exogenous: Constant
Lag Length: 0 (Automatic - based on SIC, maxlag=1)

		t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic		-2.036548	0.2690
Test critical values:	1% level	-4.297073	
	5% level	-3.212696	
	10% level	-2.747676	

*MacKinnon (1996) one-sided p-values.
Warning: Probabilities and critical values calculated for 20 observations
and may not be accurate for a sample size of 10

Augmented Dickey-Fuller Test Equation
Dependent Variable: D(LCHEQUES)
Method: Least Squares
Date: 10/01/20 Time: 21:47
Sample (adjusted): 2008 2017
Included observations: 10 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
LCHEQUES(-1)	-0.631316	0.309993	-2.036548	0.0761
C	6.947525	3.408176	2.038488	0.0759

R-squared	0.341430	Mean dependent var	0.006762
Adjusted R-squared	0.259109	S.D. dependent var	0.082622
S.E. of regression	0.071117	Akaike info criterion	-2.272138
Sum squared resid	0.040460	Schwarz criterion	-2.211621
Log likelihood	13.36069	Hannan-Quinn criter.	-2.338525
F-statistic	4.147529	Durbin-Watson stat	1.380456
Prob(F-statistic)	0.076080		

Cashless Payment Cheque Augmented Dickey-Fuller test On Level with Trend and intercept

Null Hypothesis: LCHEQUES has a unit root
Exogenous: Constant, Linear Trend
Lag Length: 1 (Automatic - based on SIC, maxlag=1)

		t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic		-3.802533	0.0718
Test critical values:	1% level	-5.521860	
	5% level	-4.107833	
	10% level	-3.515047	

*MacKinnon (1996) one-sided p-values.
Warning: Probabilities and critical values calculated for 20 observations
and may not be accurate for a sample size of 9

Augmented Dickey-Fuller Test Equation
Dependent Variable: D(LCHEQUES)
Method: Least Squares
Date: 10/01/20 Time: 21:48

Sample (adjusted): 2009 2017
Included observations: 9 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
LCHEQUES(-1)	-1.244988	0.327410	-3.802533	0.0126
D(LCHEQUES(-1))	0.697580	0.264697	2.635386	0.0462
C	13.56624	3.573602	3.796237	0.0127
@TREND("2007")	0.019726	0.007897	2.498034	0.0546

R-squared	0.746209	Mean dependent var	-0.004782
Adjusted R-squared	0.593935	S.D. dependent var	0.078616
S.E. of regression	0.050097	Akaike info criterion	-2.848622
Sum squared resid	0.012548	Schwarz criterion	-2.760966
Log likelihood	16.81880	Hannan-Quinn criter.	-3.037782
F-statistic	4.900425	Durbin-Watson stat	0.774367
Prob(F-statistic)	0.059780		

Cashless Payment Cheque Augmented Dickey-Fuller test 1st Level with intercept

Null Hypothesis: D(LCHEQUES) has a unit root
Exogenous: Constant
Lag Length: 1 (Automatic - based on SIC, maxlag=1)

		t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic		-5.274257	0.0045
Test critical values:	1% level	-4.582648	
	5% level	-3.320969	
	10% level	-2.801384	

*MacKinnon (1996) one-sided p-values.
Warning: Probabilities and critical values calculated for 20 observations
and may not be accurate for a sample size of 8

Augmented Dickey-Fuller Test Equation
Dependent Variable: D(LCHEQUES,2)
Method: Least Squares
Date: 10/01/20 Time: 21:48
Sample (adjusted): 2010 2017
Included observations: 8 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
D(LCHEQUES(-1))	-1.321888	0.250630	-5.274257	0.0033
D(LCHEQUES(-1),2)	0.654422	0.172674	3.789918	0.0128
C	0.016370	0.015065	1.086600	0.3268

R-squared	0.848735	Mean dependent var	0.009207
Adjusted R-squared	0.788229	S.D. dependent var	0.091570
S.E. of regression	0.042139	Akaike info criterion	-3.215686
Sum squared resid	0.008879	Schwarz criterion	-3.185896
Log likelihood	15.86275	Hannan-Quinn criter.	-3.416612
F-statistic	14.02727	Durbin-Watson stat	0.919349
Prob(F-statistic)	0.008899		

Cashless Payment Cheque Augmented Dickey-Fuller test 1st Level with Trend and intercept

Null Hypothesis: D(LCHEQUES) has a unit root
Exogenous: Constant, Linear Trend
Lag Length: 1 (Automatic - based on SIC, maxlag=1)

		t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic		-7.126125	0.0035
Test critical values:	1% level	-5.835186	
	5% level	-4.246503	
	10% level	-3.590496	

*MacKinnon (1996) one-sided p-values.
Warning: Probabilities and critical values calculated for 20 observations
and may not be accurate for a sample size of 8

Augmented Dickey-Fuller Test Equation
Dependent Variable: D(LCHEQUES,2)
Method: Least Squares
Date: 10/01/20 Time: 21:49
Sample (adjusted): 2010 2017
Included observations: 8 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
D(LCHEQUES(-1))	-1.286012	0.180464	-7.126125	0.0021
D(LCHEQUES(-1),2)	0.680515	0.124382	5.471166	0.0054
C	0.090783	0.032961	2.754256	0.0512
@TREND("2007")	-0.011381	0.004762	-2.389797	0.0752

R-squared	0.937694	Mean dependent var	0.009207
Adjusted R-squared	0.890965	S.D. dependent var	0.091570
S.E. of regression	0.030237	Akaike info criterion	-3.852664
Sum squared resid	0.003657	Schwarz criterion	-3.812944
Log likelihood	19.41066	Hannan-Quinn criter.	-4.120565
F-statistic	20.06646	Durbin-Watson stat	2.302433
Prob(F-statistic)	0.007126		

Cashless Payment Card and E-money Augmented Dickey-Fuller test On Level with intercept

Null Hypothesis: LCARD has a unit root
Exogenous: Constant
Lag Length: 0 (Automatic - based on SIC, maxlag=1)

		t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic		-1.927041	0.3087
Test critical values:	1% level	-4.297073	
	5% level	-3.212696	
	10% level	-2.747676	

*MacKinnon (1996) one-sided p-values.
Warning: Probabilities and critical values calculated for 20 observations
and may not be accurate for a sample size of 10

Augmented Dickey-Fuller Test Equation
Dependent Variable: D(LCARD)
Method: Least Squares
Date: 10/01/20 Time: 21:45
Sample (adjusted): 2008 2017
Included observations: 10 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
LCARD(-1)	-0.552880	0.286906	-1.927041	0.0901
C	4.462986	2.351163	1.898203	0.0942

R-squared	0.317027	Mean dependent var	-0.057717
Adjusted R-squared	0.231655	S.D. dependent var	0.565678
S.E. of regression	0.495847	Akaike info criterion	1.611757
Sum squared resid	1.966912	Schwarz criterion	1.672274
Log likelihood	-6.058783	Hannan-Quinn criter.	1.545370
F-statistic	3.713489	Durbin-Watson stat	1.910266
Prob(F-statistic)	0.090131		

Cashless Payment Card and E-money Augmented Dickey-Fuller test On Level with Trend and intercept

Null Hypothesis: LCARD has a unit root
Exogenous: Constant, Linear Trend
Lag Length: 0 (Automatic - based on SIC, maxlag=1)

		t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic		-1.644250	0.6999
Test critical values:	1% level	-5.295384	
	5% level	-4.008157	
	10% level	-3.460791	

*MacKinnon (1996) one-sided p-values.
Warning: Probabilities and critical values calculated for 20 observations
and may not be accurate for a sample size of 10

Augmented Dickey-Fuller Test Equation

Dependent Variable: D(LCARD)
Method: Least Squares
Date: 10/01/20 Time: 21:46
Sample (adjusted): 2008 2017
Included observations: 10 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
LCARD(-1)	-0.579963	0.352722	-1.644250	0.1441
C	4.741536	3.088554	1.535196	0.1686
@TREND("2007")	-0.010381	0.067114	-0.154679	0.8814

R-squared	0.319353	Mean dependent var	-0.057717
Adjusted R-squared	0.124883	S.D. dependent var	0.565678
S.E. of regression	0.529179	Akaike info criterion	1.808345
Sum squared resid	1.960212	Schwarz criterion	1.899120
Log likelihood	-6.041723	Hannan-Quinn criter.	1.708764
F-statistic	1.642167	Durbin-Watson stat	1.868368
Prob(F-statistic)	0.260152		

Cashless Payment Card and E-money Augmented Dickey-Fuller test 1st Level with intercept

Null Hypothesis: D(LCARD) has a unit root
Exogenous: Constant
Lag Length: 0 (Automatic - based on SIC, maxlag=1)

		t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic		-3.048547	0.0675
Test critical values:	1% level	-4.420595	
	5% level	-3.259808	
	10% level	-2.771129	

*MacKinnon (1996) one-sided p-values.
Warning: Probabilities and critical values calculated for 20 observations
and may not be accurate for a sample size of 9

Augmented Dickey-Fuller Test Equation
Dependent Variable: D(LCARD,2)
Method: Least Squares
Date: 10/01/20 Time: 21:46
Sample (adjusted): 2009 2017
Included observations: 9 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
D(LCARD(-1))	-1.134024	0.371988	-3.048547	0.0186
C	-0.093309	0.211398	-0.441390	0.6722

R-squared	0.570384	Mean dependent var	-0.010327
Adjusted R-squared	0.509011	S.D. dependent var	0.897545
S.E. of regression	0.628916	Akaike info criterion	2.103490

Sum squared resid	2.768743	Schwarz criterion	2.147318
Log likelihood	-7.465707	Hannan-Quinn criter.	2.008910
F-statistic	9.293638	Durbin-Watson stat	2.082229
Prob(F-statistic)	0.018621		

Cashless Payment Card and E-money Augmented Dickey-Fuller test 1st Level with Trend and intercept

Null Hypothesis: D(LCARD) has a unit root
Exogenous: Constant, Linear Trend
Lag Length: 1 (Automatic - based on SIC, maxlag=1)

		t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic		-3.817244	0.0794
Test critical values:	1% level	-5.835186	
	5% level	-4.246503	
	10% level	-3.590496	

*MacKinnon (1996) one-sided p-values.
Warning: Probabilities and critical values calculated for 20 observations
and may not be accurate for a sample size of 8

Augmented Dickey-Fuller Test Equation
Dependent Variable: D(LCARD,2)
Method: Least Squares
Date: 10/01/20 Time: 21:47
Sample (adjusted): 2010 2017
Included observations: 8 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
D(LCARD(-1))	-2.024716	0.530413	-3.817244	0.0188
D(LCARD(-1),2)	0.493389	0.325125	1.517535	0.2037
C	-1.564262	0.638739	-2.448984	0.0705
@TREND("2007")	0.209465	0.090201	2.322204	0.0809

R-squared	0.833089	Mean dependent var	0.001959
Adjusted R-squared	0.707906	S.D. dependent var	0.958707
S.E. of regression	0.518140	Akaike info criterion	1.829711
Sum squared resid	1.073877	Schwarz criterion	1.869432
Log likelihood	-3.318845	Hannan-Quinn criter.	1.561811
F-statistic	6.654954	Durbin-Watson stat	0.997782
Prob(F-statistic)	0.049232		

Cashless Payment Direct Debit Augmented Dickey-Fuller test On Level with intercept

Null Hypothesis: LDIRECT has a unit root
Exogenous: Constant
Lag Length: 0 (Automatic - based on SIC, maxlag=1)

		t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic		-0.109241	0.9229
Test critical values:	1% level	-4.297073	
	5% level	-3.212696	
	10% level	-2.747676	

*MacKinnon (1996) one-sided p-values.
Warning: Probabilities and critical values calculated for 20 observations
and may not be accurate for a sample size of 10

Augmented Dickey-Fuller Test Equation
Dependent Variable: D(LDIRECT)
Method: Least Squares
Date: 10/01/20 Time: 21:53
Sample (adjusted): 2008 2017
Included observations: 10 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
LDIRECT(-1)	-0.011852	0.108490	-0.109241	0.9157
C	0.244314	0.874795	0.279281	0.7871

R-squared	0.001489	Mean dependent var	0.148939
Adjusted R-squared	-0.123324	S.D. dependent var	0.163598
S.E. of regression	0.173392	Akaike info criterion	-0.489665
Sum squared resid	0.240519	Schwarz criterion	-0.429148
Log likelihood	4.448326	Hannan-Quinn criter.	-0.556052
F-statistic	0.011934	Durbin-Watson stat	2.066425
Prob(F-statistic)	0.915702		

Cashless Payment Direct Debit Augmented Dickey-Fuller test On Level with Trend and intercept

Null Hypothesis: LDIRECT has a unit root
Exogenous: Constant, Linear Trend
Lag Length: 1 (Automatic - based on SIC, maxlag=1)

		t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic		-4.104043	0.0504
Test critical values:	1% level	-5.521860	
	5% level	-4.107833	
	10% level	-3.515047	

*MacKinnon (1996) one-sided p-values.
Warning: Probabilities and critical values calculated for 20 observations
and may not be accurate for a sample size of 9

Augmented Dickey-Fuller Test Equation

Dependent Variable: D(LDIRECT)
Method: Least Squares
Date: 10/01/20 Time: 21:54
Sample (adjusted): 2009 2017
Included observations: 9 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
LDIRECT(-1)	-1.612338	0.392866	-4.104043	0.0093
D(LDIRECT(-1))	0.543869	0.310024	1.754279	0.1397
C	11.42018	2.751708	4.150215	0.0089
@TREND("2007")	0.288127	0.069292	4.158172	0.0088

R-squared	0.780136	Mean dependent var	0.156207
Adjusted R-squared	0.648218	S.D. dependent var	0.171800
S.E. of regression	0.101897	Akaike info criterion	-1.428608
Sum squared resid	0.051915	Schwarz criterion	-1.340953
Log likelihood	10.42874	Hannan-Quinn criter.	-1.617768
F-statistic	5.913779	Durbin-Watson stat	2.425887
Prob(F-statistic)	0.042379		

Cashless Payment Direct Debit Augmented Dickey-Fuller test 1st Level with intercept

Null Hypothesis: D(LDIRECT) has a unit root
Exogenous: Constant
Lag Length: 0 (Automatic - based on SIC, maxlag=1)

		t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic		-2.854407	0.0888
Test critical values:	1% level	-4.420595	
	5% level	-3.259808	
	10% level	-2.771129	

*MacKinnon (1996) one-sided p-values.
Warning: Probabilities and critical values calculated for 20 observations
and may not be accurate for a sample size of 9

Augmented Dickey-Fuller Test Equation
Dependent Variable: D(LDIRECT,2)
Method: Least Squares
Date: 10/01/20 Time: 21:55
Sample (adjusted): 2009 2017
Included observations: 9 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
D(LDIRECT(-1))	-1.145148	0.401186	-2.854407	0.0245
C	0.180693	0.090883	1.988194	0.0871

R-squared	0.537882	Mean dependent var	-0.012493
Adjusted R-squared	0.471865	S.D. dependent var	0.250394
S.E. of regression	0.181969	Akaike info criterion	-0.376833
Sum squared resid	0.231789	Schwarz criterion	-0.333005

Log likelihood	3.695748	Hannan-Quinn criter.	-0.471413
F-statistic	8.147641	Durbin-Watson stat	1.858638
Prob(F-statistic)	0.024533		

Cashless Payment Direct Debit Augmented Dickey-Fuller test 1st Level with Trend and intercept

Null Hypothesis: D(LDIRECT) has a unit root
Exogenous: Constant, Linear Trend
Lag Length: 0 (Automatic - based on SIC, maxlag=1)

		t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic		-2.572374	0.2993
Test critical values:	1% level	-5.521860	
	5% level	-4.107833	
	10% level	-3.515047	

*MacKinnon (1996) one-sided p-values.
Warning: Probabilities and critical values calculated for 20 observations
and may not be accurate for a sample size of 9

Augmented Dickey-Fuller Test Equation
Dependent Variable: D(LDIRECT,2)
Method: Least Squares
Date: 10/01/20 Time: 21:55
Sample (adjusted): 2009 2017
Included observations: 9 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
D(LDIRECT(-1))	-1.218366	0.473635	-2.572374	0.0422
C	0.132576	0.164203	0.807392	0.4503
@TREND("2007")	0.010078	0.027734	0.363381	0.7288

R-squared	0.547833	Mean dependent var	-0.012493
Adjusted R-squared	0.397111	S.D. dependent var	0.250394
S.E. of regression	0.194421	Akaike info criterion	-0.176380
Sum squared resid	0.226797	Schwarz criterion	-0.110638
Log likelihood	3.793709	Hannan-Quinn criter.	-0.318250
F-statistic	3.634717	Durbin-Watson stat	1.824132
Prob(F-statistic)	0.092448		

Cashless Payment Direct Debit Augmented Dickey-Fuller test 2nd Level with intercept

Null Hypothesis: D(LDIRECT,2) has a unit root
Exogenous: Constant
Lag Length: 0 (Automatic - based on SIC, maxlag=1)

	t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic	-3.327539	0.0496

Test critical values:	1% level	-4.582648	
	5% level	-3.320969	
	10% level	-2.801384	

*MacKinnon (1996) one-sided p-values.
Warning: Probabilities and critical values calculated for 20 observations
and may not be accurate for a sample size of 8

Augmented Dickey-Fuller Test Equation
Dependent Variable: D(LDIRECT,3)
Method: Least Squares
Date: 10/01/20 Time: 21:56
Sample (adjusted): 2010 2017
Included observations: 8 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
D(LDIRECT(-1),2)	-1.554571	0.467184	-3.327539	0.0159
C	0.031630	0.091126	0.347097	0.7404

R-squared	0.648558	Mean dependent var	-0.033123
Adjusted R-squared	0.589984	S.D. dependent var	0.393237
S.E. of regression	0.251799	Akaike info criterion	0.291948
Sum squared resid	0.380417	Schwarz criterion	0.311808
Log likelihood	0.832209	Hannan-Quinn criter.	0.157998
F-statistic	11.07251	Durbin-Watson stat	1.853962
Prob(F-statistic)	0.015855		

Cashless Payment Direct Debit Augmented Dickey-Fuller test 2nd Level with Trend and intercept

Null Hypothesis: D(LDIRECT,2) has a unit root
Exogenous: Constant, Linear Trend
Lag Length: 0 (Automatic - based on SIC, maxlag=1)

		t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic		-3.036573	0.1879
Test critical values:	1% level	-5.835186	
	5% level	-4.246503	
	10% level	-3.590496	

*MacKinnon (1996) one-sided p-values.
Warning: Probabilities and critical values calculated for 20 observations
and may not be accurate for a sample size of 8

Augmented Dickey-Fuller Test Equation
Dependent Variable: D(LDIRECT,3)
Method: Least Squares
Date: 10/01/20 Time: 21:57
Sample (adjusted): 2010 2017
Included observations: 8 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.

D(LDIRECT(-1),2)	-1.456122	0.479528	-3.036573	0.0289
C	0.281161	0.270931	1.037760	0.3469
@TREND("2007")	-0.039020	0.039880	-0.978441	0.3728

R-squared	0.705035	Mean dependent var	-0.033123
Adjusted R-squared	0.587049	S.D. dependent var	0.393237
S.E. of regression	0.252699	Akaike info criterion	0.366760
Sum squared resid	0.319284	Schwarz criterion	0.396551
Log likelihood	1.532958	Hannan-Quinn criter.	0.165835
F-statistic	5.975575	Durbin-Watson stat	2.142490
Prob(F-statistic)	0.047253		

Government Size Augmented Dickey-Fuller test On Level with intercept

Null Hypothesis: LGOV has a unit root
Exogenous: Constant
Lag Length: 0 (Automatic - based on SIC, maxlag=1)

		t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic		-2.806435	0.0916
Test critical values:	1% level	-4.297073	
	5% level	-3.212696	
	10% level	-2.747676	

*MacKinnon (1996) one-sided p-values.
Warning: Probabilities and critical values calculated for 20 observations
and may not be accurate for a sample size of 10

Augmented Dickey-Fuller Test Equation
Dependent Variable: D(LGOV)
Method: Least Squares
Date: 10/01/20 Time: 22:01
Sample (adjusted): 2008 2017
Included observations: 10 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
LGOV(-1)	-0.396810	0.141393	-2.806435	0.0230
C	1.114512	0.391668	2.845554	0.0216

R-squared	0.496097	Mean dependent var	0.015628
Adjusted R-squared	0.433109	S.D. dependent var	0.038852
S.E. of regression	0.029253	Akaike info criterion	-4.048828
Sum squared resid	0.006846	Schwarz criterion	-3.988311
Log likelihood	22.24414	Hannan-Quinn criter.	-4.115215
F-statistic	7.876079	Durbin-Watson stat	2.511145
Prob(F-statistic)	0.022969		

Government Size Augmented Dickey-Fuller test On Level with Trend and intercept

Null Hypothesis: LGOV has a unit root

Exogenous: Constant, Linear Trend
Lag Length: 0 (Automatic - based on SIC, maxlag=1)

		t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic		-1.280052	0.8290
Test critical values:	1% level	-5.295384	
	5% level	-4.008157	
	10% level	-3.460791	

*MacKinnon (1996) one-sided p-values.
Warning: Probabilities and critical values calculated for 20 observations
and may not be accurate for a sample size of 10

Augmented Dickey-Fuller Test Equation
Dependent Variable: D(LGOV)
Method: Least Squares
Date: 10/01/20 Time: 22:02
Sample (adjusted): 2008 2017
Included observations: 10 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
LGOV(-1)	-0.434029	0.339071	-1.280052	0.2413
C	1.212376	0.901208	1.345278	0.2205
@TREND("2007")	0.000947	0.007723	0.122595	0.9059

R-squared	0.497177	Mean dependent var	0.015628
Adjusted R-squared	0.353513	S.D. dependent var	0.038852
S.E. of regression	0.031239	Akaike info criterion	-3.850973
Sum squared resid	0.006831	Schwarz criterion	-3.760197
Log likelihood	22.25486	Hannan-Quinn criter.	-3.950553
F-statistic	3.460698	Durbin-Watson stat	2.448631
Prob(F-statistic)	0.090147		

Government Size Augmented Dickey-Fuller test 1st Level with intercept

Null Hypothesis: D(LGOV) has a unit root
Exogenous: Constant
Lag Length: 0 (Automatic - based on SIC, maxlag=1)

		t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic		-2.351112	0.1779
Test critical values:	1% level	-4.420595	
	5% level	-3.259808	
	10% level	-2.771129	

*MacKinnon (1996) one-sided p-values.
Warning: Probabilities and critical values calculated for 20 observations
and may not be accurate for a sample size of 9

Augmented Dickey-Fuller Test Equation
Dependent Variable: D(LGOV,2)

Method: Least Squares
Date: 10/01/20 Time: 22:03
Sample (adjusted): 2009 2017
Included observations: 9 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
D(LGOV(-1))	-0.992320	0.422064	-2.351112	0.0510
C	0.013931	0.017112	0.814062	0.4424

R-squared	0.441239	Mean dependent var	-0.007172
Adjusted R-squared	0.361416	S.D. dependent var	0.054696
S.E. of regression	0.043709	Akaike info criterion	-3.229413
Sum squared resid	0.013373	Schwarz criterion	-3.185585
Log likelihood	16.53236	Hannan-Quinn criter.	-3.323993
F-statistic	5.527725	Durbin-Watson stat	1.376491
Prob(F-statistic)	0.051004		

Government Size Augmented Dickey-Fuller test 1st Level with Trend and intercept

Null Hypothesis: D(LGOV) has a unit root
Exogenous: Constant, Linear Trend
Lag Length: 0 (Automatic - based on SIC, maxlag=1)

		t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic		-4.200957	0.0453
Test critical values:	1% level	-5.521860	
	5% level	-4.107833	
	10% level	-3.515047	

*MacKinnon (1996) one-sided p-values.
Warning: Probabilities and critical values calculated for 20 observations
and may not be accurate for a sample size of 9

Augmented Dickey-Fuller Test Equation
Dependent Variable: D(LGOV,2)
Method: Least Squares
Date: 10/01/20 Time: 22:04
Sample (adjusted): 2009 2017
Included observations: 9 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
D(LGOV(-1))	-1.469158	0.349720	-4.200957	0.0057
C	0.101078	0.034049	2.968577	0.0250
@TREND("2007")	-0.012834	0.004676	-2.745011	0.0335

R-squared	0.752306	Mean dependent var	-0.007172
Adjusted R-squared	0.669741	S.D. dependent var	0.054696
S.E. of regression	0.031433	Akaike info criterion	-3.820716
Sum squared resid	0.005928	Schwarz criterion	-3.754974

Log likelihood	20.19322	Hannan-Quinn criter.	-3.962586
F-statistic	9.111700	Durbin-Watson stat	1.344899
Prob(F-statistic)	0.015197		

Democracy Index Augmented Dickey-Fuller test On Level with intercept

Null Hypothesis: LDCL has a unit root
Exogenous: Constant
Lag Length: 0 (Automatic - based on SIC, maxlag=1)

		t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic		-0.807386	0.7719
Test critical values:	1% level	-4.297073	
	5% level	-3.212696	
	10% level	-2.747676	

*MacKinnon (1996) one-sided p-values.
Warning: Probabilities and critical values calculated for 20 observations
and may not be accurate for a sample size of 10

Augmented Dickey-Fuller Test Equation
Dependent Variable: D(LDCL)
Method: Least Squares
Date: 10/01/20 Time: 21:50
Sample (adjusted): 2008 2017
Included observations: 10 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
LDCL(-1)	-0.234647	0.290625	-0.807386	0.4428
C	0.773203	0.988607	0.782114	0.4567

R-squared	0.075345	Mean dependent var	-0.024686
Adjusted R-squared	-0.040237	S.D. dependent var	0.083739
S.E. of regression	0.085407	Akaike info criterion	-1.905914
Sum squared resid	0.058355	Schwarz criterion	-1.845397
Log likelihood	11.52957	Hannan-Quinn criter.	-1.972302
F-statistic	0.651873	Durbin-Watson stat	2.150841
Prob(F-statistic)	0.442785		

Democracy Index Augmented Dickey-Fuller test On Level with Trend and intercept

Null Hypothesis: LDCL has a unit root

Exogenous: Constant, Linear Trend
Lag Length: 0 (Automatic - based on SIC, maxlag=1)

		t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic		-2.005437	0.5294
Test critical values:	1% level	-5.295384	
	5% level	-4.008157	
	10% level	-3.460791	

*MacKinnon (1996) one-sided p-values.
Warning: Probabilities and critical values calculated for 20 observations
and may not be accurate for a sample size of 10

Augmented Dickey-Fuller Test Equation
Dependent Variable: D(LDCL)
Method: Least Squares
Date: 10/01/20 Time: 21:50
Sample (adjusted): 2008 2017
Included observations: 10 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
LDCL(-1)	-0.718338	0.358195	-2.005437	0.0849
C	2.539182	1.264269	2.008419	0.0846
@TREND("2007")	-0.022044	0.011589	-1.902088	0.0989

R-squared	0.390410	Mean dependent var	-0.024686
Adjusted R-squared	0.216242	S.D. dependent var	0.083739
S.E. of regression	0.074134	Akaike info criterion	-2.122549
Sum squared resid	0.038471	Schwarz criterion	-2.031774
Log likelihood	13.61275	Hannan-Quinn criter.	-2.222130
F-statistic	2.241566	Durbin-Watson stat	2.022712
Prob(F-statistic)	0.176861		

Democracy Index Augmented Dickey-Fuller test 1stLevel with intercept

Null Hypothesis: D(LDCL) has a unit root
Exogenous: Constant
Lag Length: 0 (Automatic - based on SIC, maxlag=1)

		t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic		-3.471418	0.0371
Test critical values:	1% level	-4.420595	
	5% level	-3.259808	
	10% level	-2.771129	

*MacKinnon (1996) one-sided p-values.
Warning: Probabilities and critical values calculated for 20 observations
and may not be accurate for a sample size of 9

Augmented Dickey-Fuller Test Equation
Dependent Variable: D(LDCL,2)
Method: Least Squares
Date: 10/01/20 Time: 21:51
Sample (adjusted): 2009 2017
Included observations: 9 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
D(LDCL(-1))	-1.270080	0.365868	-3.471418	0.0104
C	-0.031309	0.032083	-0.975896	0.3616

R-squared	0.632560	Mean dependent var	0.003528
Adjusted R-squared	0.580069	S.D. dependent var	0.141073
S.E. of regression	0.091418	Akaike info criterion	-1.753619
Sum squared resid	0.058501	Schwarz criterion	-1.709791
Log likelihood	9.891285	Hannan-Quinn criter.	-1.848199
F-statistic	12.05075	Durbin-Watson stat	2.039691
Prob(F-statistic)	0.010386		

Democracy Index Augmented Dickey-Fuller test 1st Level with Trend and intercept

Null Hypothesis: D(LDCL) has a unit root
Exogenous: Constant, Linear Trend
Lag Length: 1 (Automatic - based on SIC, maxlag=1)

		t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic		-2.726272	0.2590
Test critical values:	1% level	-5.835186	
	5% level	-4.246503	
	10% level	-3.590496	

*MacKinnon (1996) one-sided p-values.
Warning: Probabilities and critical values calculated for 20 observations
and may not be accurate for a sample size of 8

Augmented Dickey-Fuller Test Equation
Dependent Variable: D(LDCL,2)
Method: Least Squares
Date: 10/01/20 Time: 21:51
Sample (adjusted): 2010 2017
Included observations: 8 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
D(LDCL(-1))	-2.351261	0.862446	-2.726272	0.0526
D(LDCL(-1),2)	0.646523	0.501930	1.288075	0.2672
C	0.103663	0.118410	0.875460	0.4307
@TREND("2007")	-0.026680	0.019844	-1.344503	0.2500

R-squared	0.769033	Mean dependent var	-0.003969
Adjusted R-squared	0.595808	S.D. dependent var	0.148884
S.E. of regression	0.094655	Akaike info criterion	-1.570305

Sum squared resid	0.035838	Schwarz criterion	-1.530584
Log likelihood	10.28122	Hannan-Quinn criter.	-1.838206
F-statistic	4.439496	Durbin-Watson stat	2.418163
Prob(F-statistic)	0.091954		

Democracy Index Augmented Dickey-Fuller test 2nd Level with intercept

Null Hypothesis: D(LDCL,2) has a unit root
Exogenous: Constant
Lag Length: 1 (Automatic - based on SIC, maxlag=1)

		t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic		-2.530366	0.1471
Test critical values:	1% level	-4.803492	
	5% level	-3.403313	
	10% level	-2.841819	

*MacKinnon (1996) one-sided p-values.
Warning: Probabilities and critical values calculated for 20 observations
and may not be accurate for a sample size of 7

Augmented Dickey-Fuller Test Equation
Dependent Variable: D(LDCL,3)
Method: Least Squares
Date: 10/01/20 Time: 21:52
Sample (adjusted): 2011 2017
Included observations: 7 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
D(LDCL(-1),2)	-2.889144	1.141789	-2.530366	0.0646
D(LDCL(-1),3)	0.847609	0.689800	1.228774	0.2865
C	-0.030771	0.057384	-0.536227	0.6202

R-squared	0.839439	Mean dependent var	0.004536
Adjusted R-squared	0.759159	S.D. dependent var	0.283316
S.E. of regression	0.139039	Akaike info criterion	-0.810599
Sum squared resid	0.077327	Schwarz criterion	-0.833781
Log likelihood	5.837098	Hannan-Quinn criter.	-1.097117
F-statistic	10.45634	Durbin-Watson stat	2.573786
Prob(F-statistic)	0.025780		

Democracy Index Augmented Dickey-Fuller test 2nd Level with Trend and intercept

Null Hypothesis: D(LDCL,2) has a unit root
Exogenous: Constant, Linear Trend
Lag Length: 0 (Automatic - based on SIC, maxlag=1)

		t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic		-4.342721	0.0459
Test critical values:	1% level	-5.835186	
	5% level	-4.246503	
	10% level	-3.590496	

*MacKinnon (1996) one-sided p-values.
Warning: Probabilities and critical values calculated for 20 observations
and may not be accurate for a sample size of 8

Augmented Dickey-Fuller Test Equation
Dependent Variable: D(LDCL,3)
Method: Least Squares
Date: 10/01/20 Time: 21:53
Sample (adjusted): 2010 2017
Included observations: 8 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
D(LDCL(-1),2)	-1.559103	0.359015	-4.342721	0.0074
C	-0.066150	0.152275	-0.434408	0.6821
@TREND("2007")	0.009908	0.022103	0.448244	0.6727

R-squared	0.791094	Mean dependent var	-0.007937
Adjusted R-squared	0.707532	S.D. dependent var	0.264661
S.E. of regression	0.143130	Akaike info criterion	-0.770134
Sum squared resid	0.102431	Schwarz criterion	-0.740344
Log likelihood	6.080536	Hannan-Quinn criter.	-0.971060
F-statistic	9.467101	Durbin-Watson stat	2.235311
Prob(F-statistic)	0.019947		

Economy Growth Augmented Dickey-Fuller test On Level with intercept

Null Hypothesis: LGDP has a unit root
Exogenous: Constant
Lag Length: 0 (Automatic - based on SIC, maxlag=1)

		t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic		-1.400623	0.5388
Test critical values:	1% level	-4.297073	
	5% level	-3.212696	
	10% level	-2.747676	

*MacKinnon (1996) one-sided p-values.
Warning: Probabilities and critical values calculated for 20 observations
and may not be accurate for a sample size of 10

Augmented Dickey-Fuller Test Equation
Dependent Variable: D(LGDP)
Method: Least Squares
Date: 10/01/20 Time: 21:58
Sample (adjusted): 2008 2017
Included observations: 10 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
LGDP(-1)	-0.189236	0.135109	-1.400623	0.1989
C	1.671023	1.157089	1.444161	0.1867

R-squared	0.196928	Mean dependent var	0.050647
Adjusted R-squared	0.096544	S.D. dependent var	0.070323
S.E. of regression	0.066843	Akaike info criterion	-2.396096
Sum squared resid	0.035743	Schwarz criterion	-2.335579
Log likelihood	13.98048	Hannan-Quinn criter.	-2.462483
F-statistic	1.961746	Durbin-Watson stat	2.234034
Prob(F-statistic)	0.198900		

Economy Growth Augmented Dickey-Fuller test On Level withTrend and intercept

Null Hypothesis: LGDP has a unit root
Exogenous: Constant, Linear Trend
Lag Length: 0 (Automatic - based on SIC, maxlag=1)

		t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic		-1.625017	0.7084
Test critical values:	1% level	-5.295384	
	5% level	-4.008157	
	10% level	-3.460791	

*MacKinnon (1996) one-sided p-values.
Warning: Probabilities and critical values calculated for 20 observations
and may not be accurate for a sample size of 10

Augmented Dickey-Fuller Test Equation
Dependent Variable: D(LGDP)
Method: Least Squares
Date: 10/01/20 Time: 21:58
Sample (adjusted): 2008 2017
Included observations: 10 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
LGDP(-1)	-0.497169	0.305947	-1.625017	0.1482
C	4.205313	2.537597	1.657203	0.1414
@TREND("2007")	0.018626	0.016664	1.117718	0.3006

R-squared	0.318547	Mean dependent var	0.050647
Adjusted R-squared	0.123846	S.D. dependent var	0.070323
S.E. of regression	0.065825	Akaike info criterion	-2.360313

Sum squared resid	0.030330	Schwarz criterion	-2.269538
Log likelihood	14.80157	Hannan-Quinn criter.	-2.459894
F-statistic	1.636086	Durbin-Watson stat	1.935133
Prob(F-statistic)	0.261231		

Economy Growth Augmented Dickey-Fuller test 1st Level with intercept

Null Hypothesis: D(LGDP) has a unit root
Exogenous: Constant
Lag Length: 0 (Automatic - based on SIC, maxlag=1)

		t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic		-3.042397	0.0681
Test critical values:	1% level	-4.420595	
	5% level	-3.259808	
	10% level	-2.771129	

*MacKinnon (1996) one-sided p-values.
Warning: Probabilities and critical values calculated for 20 observations
and may not be accurate for a sample size of 9

Augmented Dickey-Fuller Test Equation
Dependent Variable: D(LGDP,2)
Method: Least Squares
Date: 10/01/20 Time: 21:59
Sample (adjusted): 2009 2017
Included observations: 9 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
D(LGDP(-1))	-1.136087	0.373418	-3.042397	0.0188
C	0.051666	0.030767	1.679269	0.1370

R-squared	0.569395	Mean dependent var	-0.000250
Adjusted R-squared	0.507879	S.D. dependent var	0.109483
S.E. of regression	0.076804	Akaike info criterion	-2.102000
Sum squared resid	0.041292	Schwarz criterion	-2.058172
Log likelihood	11.45900	Hannan-Quinn criter.	-2.196580
F-statistic	9.256179	Durbin-Watson stat	1.586397
Prob(F-statistic)	0.018783		

Economy Growth Augmented Dickey-Fuller test 1st Level with Trend and intercept

Null Hypothesis: D(LGDP) has a unit root
Exogenous: Constant, Linear Trend
Lag Length: 0 (Automatic - based on SIC, maxlag=1)

		t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic		-2.869078	0.2195
Test critical values:	1% level	-5.521860	
	5% level	-4.107833	
	10% level	-3.515047	

*MacKinnon (1996) one-sided p-values.
Warning: Probabilities and critical values calculated for 20 observations
and may not be accurate for a sample size of 9

Augmented Dickey-Fuller Test Equation
Dependent Variable: D(LGDP,2)
Method: Least Squares
Date: 10/01/20 Time: 21:59
Sample (adjusted): 2009 2017
Included observations: 9 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
D(LGDP(-1))	-1.250438	0.435833	-2.869078	0.0285
C	0.098482	0.084564	1.164586	0.2884
@TREND("2007")	-0.006932	0.011573	-0.598974	0.5711

R-squared	0.593690	Mean dependent var	-0.000250
Adjusted R-squared	0.458253	S.D. dependent var	0.109483
S.E. of regression	0.080583	Akaike info criterion	-1.937853
Sum squared resid	0.038962	Schwarz criterion	-1.872111
Log likelihood	11.72034	Hannan-Quinn criter.	-2.079723
F-statistic	4.383521	Durbin-Watson stat	1.544348
Prob(F-statistic)	0.067077		

Economy Growth Augmented Dickey-Fuller test 2nd Level with intercept

Null Hypothesis: D(LGDP,2) has a unit root
Exogenous: Constant
Lag Length: 0 (Automatic - based on SIC, maxlag=1)

		t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic		-5.104020	0.0054
Test critical values:	1% level	-4.582648	
	5% level	-3.320969	
	10% level	-2.801384	

*MacKinnon (1996) one-sided p-values.
Warning: Probabilities and critical values calculated for 20 observations
and may not be accurate for a sample size of 8

Augmented Dickey-Fuller Test Equation
Dependent Variable: D(LGDP,3)
Method: Least Squares

Date: 10/01/20 Time: 22:00
Sample (adjusted): 2010 2017
Included observations: 8 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
D(LGDP(-1),2)	-1.535571	0.300855	-5.104020	0.0022
C	0.011970	0.032107	0.372815	0.7221

R-squared	0.812798	Mean dependent var	0.025672
Adjusted R-squared	0.781598	S.D. dependent var	0.193640
S.E. of regression	0.090495	Akaike info criterion	-1.754737
Sum squared resid	0.049136	Schwarz criterion	-1.734876
Log likelihood	9.018948	Hannan-Quinn criter.	-1.888687
F-statistic	26.05102	Durbin-Watson stat	0.959026
Prob(F-statistic)	0.002213		

Economy Growth Augmented Dickey-Fuller test 2nd Level with Trend and intercept

Null Hypothesis: D(LGDP,2) has a unit root
Exogenous: Constant, Linear Trend
Lag Length: 0 (Automatic - based on SIC, maxlag=1)

		t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic		-4.644347	0.0332
Test critical values:	1% level	-5.835186	
	5% level	-4.246503	
	10% level	-3.590496	

*MacKinnon (1996) one-sided p-values.
Warning: Probabilities and critical values calculated for 20 observations and may not be accurate for a sample size of 8

Augmented Dickey-Fuller Test Equation
Dependent Variable: D(LGDP,3)
Method: Least Squares
Date: 10/01/20 Time: 22:00
Sample (adjusted): 2010 2017
Included observations: 8 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
D(LGDP(-1),2)	-1.532595	0.329991	-4.644347	0.0056
C	0.024107	0.105772	0.227912	0.8287
@TREND("2007")	-0.001863	0.015316	-0.121645	0.9079

R-squared	0.813351	Mean dependent var	0.025672
Adjusted R-squared	0.738691	S.D. dependent var	0.193640
S.E. of regression	0.098985	Akaike info criterion	-1.507692
Sum squared resid	0.048991	Schwarz criterion	-1.477901
Log likelihood	9.030768	Hannan-Quinn criter.	-1.708617
F-statistic	10.89411	Durbin-Watson stat	0.959395
Prob(F-statistic)	0.015051		

APPENDIX 4.5.4 Singapore Phillips-Perron test

Corruption Perspective Phillips-Perron test On Level with intercept

Null Hypothesis: LCPI has a unit root
Exogenous: Constant
Bandwidth: 0 (Newey-West automatic) using Bartlett kernel

		Adj. t-Stat	Prob.*
Phillips-Perron test statistic		-0.690354	0.8052
Test critical values:	1% level	-4.297073	
	5% level	-3.212696	
	10% level	-2.747676	

Corruption Perspective Phillips-Perron test On Level with Trend and intercept

Null Hypothesis: LCPI has a unit root
Exogenous: Constant, Linear Trend
Bandwidth: 1 (Newey-West automatic) using Bartlett kernel

		Adj. t-Stat	Prob.*
Phillips-Perron test statistic		-1.810199	0.6271
Test critical values:	1% level	-5.295384	
	5% level	-4.008157	
	10% level	-3.460791	

Corruption Perspective Phillips-Perron test 1st Level with intercept

Null Hypothesis: D(LCPI) has a unit root
Exogenous: Constant
Bandwidth: 0 (Newey-West automatic) using Bartlett kernel

		Adj. t-Stat	Prob.*
Phillips-Perron test statistic		-2.634260	0.1213
Test critical values:	1% level	-4.420595	
	5% level	-3.259808	
	10% level	-2.771129	

Corruption Perspective Phillips-Perron test 1st Level with Trend and intercept

Null Hypothesis: D(LCPI) has a unit root
Exogenous: Constant, Linear Trend
Bandwidth: 0 (Newey-West automatic) using Bartlett kernel

		Adj. t-Stat	Prob.*
Phillips-Perron test statistic		-2.426119	0.3470
Test critical values:	1% level	-5.521860	
	5% level	-4.107833	
	10% level	-3.515047	

Corruption Perspective Phillips-Perron test 2nd Level with intercept

Null Hypothesis: D(LCPI,2) has a unit root
Exogenous: Constant
Bandwidth: 4 (Newey-West automatic) using Bartlett kernel

		Adj. t-Stat	Prob.*
Phillips-Perron test statistic		-5.431278	0.0038
Test critical values:	1% level	-4.582648	
	5% level	-3.320969	
	10% level	-2.801384	

Corruption Perspective Phillips-Perron test 2nd Level with Trend and intercept

Null Hypothesis: D(LCPI,2) has a unit root
Exogenous: Constant, Linear Trend
Bandwidth: 7 (Newey-West automatic) using Bartlett kernel

		Adj. t-Stat	Prob.*
Phillips-Perron test statistic		-7.233055	0.0032
Test critical values:	1% level	-5.835186	
	5% level	-4.246503	
	10% level	-3.590496	

Cashless Payment Cheque Phillips-Perron test On Level with intercept

Null Hypothesis: LCHEQUE has a unit root
Exogenous: Constant
Bandwidth: 0 (Newey-West automatic) using Bartlett kernel

		Adj. t-Stat	Prob.*
Phillips-Perron test statistic		-1.715019	0.3954
Test critical values:	1% level	-4.297073	
	5% level	-3.212696	
	10% level	-2.747676	

Cashless Payment Cheque Phillips-Perron test On Level with Trend and intercept

Null Hypothesis: LCHEQUE has a unit root
Exogenous: Constant, Linear Trend
Bandwidth: 0 (Newey-West automatic) using Bartlett kernel

		Adj. t-Stat	Prob.*
Phillips-Perron test statistic		-1.768396	0.6460
Test critical values:	1% level	-5.295384	
	5% level	-4.008157	
	10% level	-3.460791	

Cashless Payment Cheque Phillips-Perron test 1st Level with intercept

Null Hypothesis: D(LCHEQUE) has a unit root
Exogenous: Constant
Bandwidth: 2 (Newey-West automatic) using Bartlett kernel

		Adj. t-Stat	Prob.*
Phillips-Perron test statistic		-2.700802	0.1105
Test critical values:	1% level	-4.420595	
	5% level	-3.259808	
	10% level	-2.771129	

Cashless Payment Cheque Phillips-Perron test 1st Level with Trend and intercept

Null Hypothesis: D(LCHEQUE) has a unit root
Exogenous: Constant, Linear Trend
Bandwidth: 6 (Newey-West automatic) using Bartlett kernel

		Adj. t-Stat	Prob.*
Phillips-Perron test statistic		-3.769728	0.0750
Test critical values:	1% level	-5.521860	
	5% level	-4.107833	
	10% level	-3.515047	

Cashless Payment Cheque Phillips-Perron test 2nd Level with intercept

Null Hypothesis: D(LCHEQUE,2) has a unit root
Exogenous: Constant
Bandwidth: 2 (Newey-West automatic) using Bartlett kernel

		Adj. t-Stat	Prob.*
Phillips-Perron test statistic		-3.564690	0.0364
Test critical values:	1% level	-4.582648	
	5% level	-3.320969	
	10% level	-2.801384	

Cashless Payment Cheque Phillips-Perron test 2nd Level with Trend and intercept

Null Hypothesis: D(LCHEQUE,2) has a unit root
Exogenous: Constant, Linear Trend
Bandwidth: 2 (Newey-West automatic) using Bartlett kernel

		Adj. t-Stat	Prob.*
Phillips-Perron test statistic		-3.452050	0.1191
Test critical values:	1% level	-5.835186	
	5% level	-4.246503	
	10% level	-3.590496	

Cashless Payment Card and E-money Phillips-Perron test On Level with intercept

Null Hypothesis: LCARD has a unit root
Exogenous: Constant
Bandwidth: 4 (Newey-West automatic) using Bartlett kernel

		Adj. t-Stat	Prob.*
Phillips-Perron test statistic		-4.664078	0.0059
Test critical values:	1% level	-4.297073	
	5% level	-3.212696	
	10% level	-2.747676	

Cashless Payment Card and E-money Phillips-Perron test On Level with Trend and intercept

Null Hypothesis: LCARD has a unit root
Exogenous: Constant, Linear Trend
Bandwidth: 9 (Newey-West automatic) using Bartlett kernel

		Adj. t-Stat	Prob.*
Phillips-Perron test statistic		2.208439	1.0000
Test critical values:	1% level	-5.295384	
	5% level	-4.008157	
	10% level	-3.460791	

Cashless Payment Card and E-money Phillips-Perron test 1st Level with intercept

Null Hypothesis: D(LCARD) has a unit root
Exogenous: Constant
Bandwidth: 1 (Newey-West automatic) using Bartlett kernel

		Adj. t-Stat	Prob.*
Phillips-Perron test statistic		-2.160859	0.2293
Test critical values:	1% level	-4.420595	
	5% level	-3.259808	
	10% level	-2.771129	

Cashless Payment Card and E-money Phillips-Perron test 1st Level with Trend and intercept

Null Hypothesis: D(LCARD) has a unit root
Exogenous: Constant, Linear Trend
Bandwidth: 2 (Newey-West automatic) using Bartlett kernel

		Adj. t-Stat	Prob.*
Phillips-Perron test statistic		-3.976871	0.0589
Test critical values:	1% level	-5.521860	
	5% level	-4.107833	
	10% level	-3.515047	

Cashless Payment Card and E-money Phillips-Perron test 2nd Level with intercept

Null Hypothesis: D(LCARD,2) has a unit root
Exogenous: Constant
Bandwidth: 1 (Newey-West automatic) using Bartlett kernel

		Adj. t-Stat	Prob.*
Phillips-Perron test statistic		-6.340551	0.0015
Test critical values:	1% level	-4.582648	
	5% level	-3.320969	
	10% level	-2.801384	

Cashless Payment Card and E-money Phillips-Perron test 2nd Level with Trend and intercept

Null Hypothesis: D(LCARD,2) has a unit root
Exogenous: Constant, Linear Trend
Bandwidth: 5 (Newey-West automatic) using Bartlett kernel

		Adj. t-Stat	Prob.*
Phillips-Perron test statistic		-11.99440	0.0001
Test critical values:	1% level	-5.835186	
	5% level	-4.246503	
	10% level	-3.590496	

Cashless Payment Direct Debit Phillips-Perron test On Level with intercept

Null Hypothesis: LDEBIT has a unit root
Exogenous: Constant
Bandwidth: 8 (Newey-West automatic) using Bartlett kernel

		Adj. t-Stat	Prob.*
Phillips-Perron test statistic		-0.207042	0.9083
Test critical values:	1% level	-4.297073	
	5% level	-3.212696	
	10% level	-2.747676	

Cashless Payment Direct Debit Phillips-Perron test On Level with Trend and intercept

Null Hypothesis: LDEBIT has a unit root
Exogenous: Constant, Linear Trend
Bandwidth: 0 (Newey-West automatic) using Bartlett kernel

		Adj. t-Stat	Prob.*
Phillips-Perron test statistic		-1.994917	0.5345
Test critical values:	1% level	-5.295384	
	5% level	-4.008157	
	10% level	-3.460791	

Cashless Payment Direct Debit Phillips-Perron test 1st Level with intercept

Null Hypothesis: D(LDEBIT) has a unit root
Exogenous: Constant
Bandwidth: 1 (Newey-West automatic) using Bartlett kernel

		Adj. t-Stat	Prob.*
Phillips-Perron test statistic		-3.093379	0.0633
Test critical values:	1% level	-4.420595	
	5% level	-3.259808	
	10% level	-2.771129	

Cashless Payment Direct Debit Phillips-Perron test 1st Level with Trend and intercept

Null Hypothesis: D(LDEBIT) has a unit root
Exogenous: Constant, Linear Trend
Bandwidth: 8 (Newey-West automatic) using Bartlett kernel

		Adj. t-Stat	Prob.*
Phillips-Perron test statistic		-6.520642	0.0038
Test critical values:	1% level	-5.521860	
	5% level	-4.107833	
	10% level	-3.515047	

Government Size Phillips-Perron test On Level with intercept

Null Hypothesis: LGOV has a unit root
Exogenous: Constant
Bandwidth: 1 (Newey-West automatic) using Bartlett kernel

		Adj. t-Stat	Prob.*
Phillips-Perron test statistic		-2.105068	0.2461
Test critical values:	1% level	-4.297073	
	5% level	-3.212696	
	10% level	-2.747676	

Government Size Phillips-Perron test On Level with Trend and intercept

Null Hypothesis: LGOV has a unit root
Exogenous: Constant, Linear Trend
Bandwidth: 1 (Newey-West automatic) using Bartlett kernel

		Adj. t-Stat	Prob.*
Phillips-Perron test statistic		-2.086600	0.4908
Test critical values:	1% level	-5.295384	
	5% level	-4.008157	
	10% level	-3.460791	

Government Size Phillips-Perron test 1st Level with intercept

Null Hypothesis: D(LGOV) has a unit root
Exogenous: Constant
Bandwidth: 1 (Newey-West automatic) using Bartlett kernel

		Adj. t-Stat	Prob.*
Phillips-Perron test statistic		-3.725629	0.0260
Test critical values:	1% level	-4.420595	
	5% level	-3.259808	
	10% level	-2.771129	

Government Size Phillips-Perron test 1st Level with Trend and intercept

Null Hypothesis: D(LGOV) has a unit root
Exogenous: Constant, Linear Trend
Bandwidth: 3 (Newey-West automatic) using Bartlett kernel

		Adj. t-Stat	Prob.*
Phillips-Perron test statistic		-4.543499	0.0304
Test critical values:	1% level	-5.521860	
	5% level	-4.107833	
	10% level	-3.515047	

Democracy Phillips-Perron test On Level with intercept

Null Hypothesis: LDEMO1 has a unit root
Exogenous: Constant
Bandwidth: 2 (Newey-West automatic) using Bartlett kernel

		Adj. t-Stat	Prob.*
Phillips-Perron test statistic		-1.899604	0.3192
Test critical values:	1% level	-4.297073	
	5% level	-3.212696	
	10% level	-2.747676	

Democracy Phillips-Perron test On Level with Trend and intercept

Null Hypothesis: LDEMO1 has a unit root
Exogenous: Constant, Linear Trend
Bandwidth: 3 (Newey-West automatic) using Bartlett kernel

		Adj. t-Stat	Prob.*
Phillips-Perron test statistic		-1.822488	0.6207
Test critical values:	1% level	-5.295384	
	5% level	-4.008157	
	10% level	-3.460791	

Democracy Phillips-Perron test 1stLevel with intercept

Null Hypothesis: D(LDEMO1) has a unit root
Exogenous: Constant
Bandwidth: 5 (Newey-West automatic) using Bartlett kernel

		Adj. t-Stat	Prob.*
Phillips-Perron test statistic		-2.960073	0.0765
Test critical values:	1% level	-4.420595	
	5% level	-3.259808	
	10% level	-2.771129	

Democracy Phillips-Perron test 1st Level with Trend and intercept

Null Hypothesis: D(LDEMO1) has a unit root
Exogenous: Constant, Linear Trend
Bandwidth: 5 (Newey-West automatic) using Bartlett kernel

		Adj. t-Stat	Prob.*
Phillips-Perron test statistic		-2.571126	0.2997
Test critical values:	1% level	-5.521860	
	5% level	-4.107833	
	10% level	-3.515047	

Democracy Phillips-Perron test 2nd Level with intercept

Null Hypothesis: D(LDEMO1,2) has a unit root
Exogenous: Constant
Bandwidth: 7 (Newey-West automatic) using Bartlett kernel

		Adj. t-Stat	Prob.*
Phillips-Perron test statistic		-5.450355	0.0037
Test critical values:	1% level	-4.582648	
	5% level	-3.320969	
	10% level	-2.801384	

Democracy Phillips-Perron test 2nd Level with Trend and intercept

Null Hypothesis: D(LDEMO1,2) has a unit root
Exogenous: Constant, Linear Trend
Bandwidth: 7 (Newey-West automatic) using Bartlett kernel

		Adj. t-Stat	Prob.*
Phillips-Perron test statistic		-5.930980	0.0092
Test critical values:	1% level	-5.835186	
	5% level	-4.246503	
	10% level	-3.590496	

Economy Growth Phillips-Perron test On Level with intercept

Null Hypothesis: LGDP2 has a unit root
Exogenous: Constant
Bandwidth: 7 (Newey-West automatic) using Bartlett kernel

		Adj. t-Stat	Prob.*
Phillips-Perron test statistic		-1.177728	0.6381
Test critical values:	1% level	-4.297073	
	5% level	-3.212696	
	10% level	-2.747676	

Economy Growth Phillips-Perron test On Level withTrend and intercept

Null Hypothesis: LGDP2 has a unit root
Exogenous: Constant, Linear Trend
Bandwidth: 2 (Newey-West automatic) using Bartlett kernel

		Adj. t-Stat	Prob.*
Phillips-Perron test statistic		-1.344365	0.8104
Test critical values:	1% level	-5.295384	
	5% level	-4.008157	
	10% level	-3.460791	

Economy Growth Phillips-Perron test 1st Level with intercept

Null Hypothesis: D(LGDP2) has a unit root
Exogenous: Constant
Bandwidth: 3 (Newey-West automatic) using Bartlett kernel

		Adj. t-Stat	Prob.*
Phillips-Perron test statistic		-2.127592	0.2394
Test critical values:	1% level	-4.420595	
	5% level	-3.259808	
	10% level	-2.771129	

Economy Growth Phillips-Perron test 1st Level withTrend and intercept

Null Hypothesis: D(LGDP2) has a unit root
Exogenous: Constant, Linear Trend
Bandwidth: 8 (Newey-West automatic) using Bartlett kernel

		Adj. t-Stat	Prob.*
Phillips-Perron test statistic		-2.402503	0.3558
Test critical values:	1% level	-5.521860	
	5% level	-4.107833	
	10% level	-3.515047	

Economy Growth Phillips-Perron test 2nd Level with intercept

Null Hypothesis: D(LGDP2,2) has a unit root
Exogenous: Constant
Bandwidth: 4 (Newey-West automatic) using Bartlett kernel

		Adj. t-Stat	Prob.*
Phillips-Perron test statistic		-3.216642	0.0574
Test critical values:	1% level	-4.582648	
	5% level	-3.320969	
	10% level	-2.801384	

Economy Growth Phillips-Perron test 2nd Level with Trend and intercept

Null Hypothesis: D(LGDP2,2) has a unit root
Exogenous: Constant, Linear Trend
Bandwidth: 3 (Newey-West automatic) using Bartlett kernel

		Adj. t-Stat	Prob.*
Phillips-Perron test statistic		-2.893881	0.2219
Test critical values:	1% level	-5.835186	
	5% level	-4.246503	
	10% level	-3.590496	

APPENDIX 4.5.5 Malaysia Phillips-Perron test

Corruption Perspective Phillips-Perron test On Level with intercept

Null Hypothesis: ICPI has a unit root
Exogenous: Constant
Bandwidth: 1 (Newey-West automatic) using Bartlett kernel

		Adj. t-Stat	Prob.*
Phillips-Perron test statistic		-1.783324	0.3662
Test critical values:	1% level	-4.297073	
	5% level	-3.212696	
	10% level	-2.747676	

*MacKinnon (1996) one-sided p-values.
Warning: Probabilities and critical values calculated for 20 observations
and may not be accurate for a sample size of 10

Residual variance (no correction)	0.003107
HAC corrected variance (Bartlett kernel)	0.003592

Phillips-Perron Test Equation
Dependent Variable: D(ICPI)
Method: Least Squares
Date: 10/01/20 Time: 21:06
Sample (adjusted): 2008 2017
Included observations: 10 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
ICPI(-1)	-0.505392	0.295328	-1.711290	0.1254
C	1.952434	1.145856	1.703908	0.1268

R-squared	0.267970	Mean dependent var	-0.008168
Adjusted R-squared	0.176466	S.D. dependent var	0.068668
S.E. of regression	0.062315	Akaike info criterion	-2.536369
Sum squared resid	0.031065	Schwarz criterion	-2.475852
Log likelihood	14.68185	Hannan-Quinn criter.	-2.602756
F-statistic	2.928512	Durbin-Watson stat	1.625216
Prob(F-statistic)	0.125391		

Corruption Perspective Phillips-Perron test On Level with Trend and intercept

Null Hypothesis: ICPI has a unit root
Exogenous: Constant, Linear Trend
Bandwidth: 1 (Newey-West automatic) using Bartlett kernel

		Adj. t-Stat	Prob.*
Phillips-Perron test statistic		-1.771230	0.6449
Test critical values:	1% level	-5.295384	
	5% level	-4.008157	
	10% level	-3.460791	

*MacKinnon (1996) one-sided p-values.
Warning: Probabilities and critical values calculated for 20 observations
and may not be accurate for a sample size of 10

Residual variance (no correction)	0.002935
HAC corrected variance (Bartlett kernel)	0.003096

Phillips-Perron Test Equation
Dependent Variable: D(ICPI)
Method: Least Squares
Date: 10/01/20 Time: 21:07
Sample (adjusted): 2008 2017
Included observations: 10 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
ICPI(-1)	-0.549184	0.314379	-1.746884	0.1242
C	2.096592	1.211665	1.730340	0.1272
@TREND("2007")	0.004678	0.007303	0.640519	0.5422

R-squared	0.308498	Mean dependent var	-0.008168
Adjusted R-squared	0.110926	S.D. dependent var	0.068668
S.E. of regression	0.064747	Akaike info criterion	-2.393325
Sum squared resid	0.029345	Schwarz criterion	-2.302550
Log likelihood	14.96663	Hannan-Quinn criter.	-2.492906
F-statistic	1.561448	Durbin-Watson stat	1.697362
Prob(F-statistic)	0.274964		

Corruption Perspective Phillips-Perron test 1st Level with intercept

Null Hypothesis: D(ICPI) has a unit root
Exogenous: Constant
Bandwidth: 1 (Newey-West automatic) using Bartlett kernel

		Adj. t-Stat	Prob.*
Phillips-Perron test statistic		-2.465014	0.1528
Test critical values:	1% level	-4.420595	
	5% level	-3.259808	
	10% level	-2.771129	

*MacKinnon (1996) one-sided p-values.
Warning: Probabilities and critical values calculated for 20 observations
and may not be accurate for a sample size of 9

Residual variance (no correction)	0.004691
HAC corrected variance (Bartlett kernel)	0.004761

Phillips-Perron Test Equation
Dependent Variable: D(ICPI,2)
Method: Least Squares
Date: 10/01/20 Time: 21:08
Sample (adjusted): 2009 2017
Included observations: 9 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
D(ICPI(-1))	-0.941652	0.382674	-2.460714	0.0434
C	-0.008816	0.025944	-0.339806	0.7440

R-squared	0.463812	Mean dependent var	-0.004630
Adjusted R-squared	0.387213	S.D. dependent var	0.099213
S.E. of regression	0.077665	Akaike info criterion	-2.079694
Sum squared resid	0.042223	Schwarz criterion	-2.035867
Log likelihood	11.35863	Hannan-Quinn criter.	-2.174274
F-statistic	6.055111	Durbin-Watson stat	1.626051
Prob(F-statistic)	0.043420		

Corruption Perspective Phillips-Perron test 1st Level with Trend and intercept

Null Hypothesis: D(ICPI) has a unit root
Exogenous: Constant, Linear Trend
Bandwidth: 1 (Newey-West automatic) using Bartlett kernel

		Adj. t-Stat	Prob.*
Phillips-Perron test statistic		-2.324740	0.3829
Test critical values:	1% level	-5.521860	
	5% level	-4.107833	
	10% level	-3.515047	

*MacKinnon (1996) one-sided p-values.
Warning: Probabilities and critical values calculated for 20 observations
and may not be accurate for a sample size of 9

Residual variance (no correction)	0.004630
HAC corrected variance (Bartlett kernel)	0.004891

Phillips-Perron Test Equation
Dependent Variable: D(ICPI,2)
Method: Least Squares
Date: 10/01/20 Time: 21:09
Sample (adjusted): 2009 2017
Included observations: 9 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
D(ICPI(-1))	-0.966195	0.419638	-2.302446	0.0609
C	-0.027614	0.071958	-0.383755	0.7144
@TREND("2007")	0.003115	0.010995	0.283296	0.7865

R-squared	0.470889	Mean dependent var	-0.004630
Adjusted R-squared	0.294519	S.D. dependent var	0.099213
S.E. of regression	0.083332	Akaike info criterion	-1.870760
Sum squared resid	0.041666	Schwarz criterion	-1.805018
Log likelihood	11.41842	Hannan-Quinn criter.	-2.012630
F-statistic	2.669888	Durbin-Watson stat	1.581173
Prob(F-statistic)	0.148129		

Corruption Perspective Phillips-Perron test 2nd Level with intercept

Null Hypothesis: D(ICPI,2) has a unit root
Exogenous: Constant
Bandwidth: 1 (Newey-West automatic) using Bartlett kernel

		Adj. t-Stat	Prob.*
Phillips-Perron test statistic		-5.048319	0.0058
Test critical values:	1% level	-4.582648	
	5% level	-3.320969	
	10% level	-2.801384	

*MacKinnon (1996) one-sided p-values.
Warning: Probabilities and critical values calculated for 20 observations
and may not be accurate for a sample size of 8

Residual variance (no correction)	0.004767
HAC corrected variance (Bartlett kernel)	0.006223

Phillips-Perron Test Equation
Dependent Variable: D(ICPI,3)
Method: Least Squares
Date: 10/01/20 Time: 21:10
Sample (adjusted): 2010 2017
Included observations: 8 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
D(ICPI(-1),2)	-1.556292	0.284666	-5.467083	0.0016
C	0.009031	0.028195	0.320327	0.7596

R-squared	0.832818	Mean dependent var	0.012962
Adjusted R-squared	0.804954	S.D. dependent var	0.180510
S.E. of regression	0.079720	Akaike info criterion	-2.008265

Sum squared resid	0.038132	Schwarz criterion	-1.988404
Log likelihood	10.03306	Hannan-Quinn criter.	-2.142215
F-statistic	29.88900	Durbin-Watson stat	1.371234
Prob(F-statistic)	0.001562		

Corruption Perspective Phillips-Perron test 2nd Level with Trend and intercept

Null Hypothesis: D(ICPI,2) has a unit root
Exogenous: Constant, Linear Trend
Bandwidth: 6 (Newey-West automatic) using Bartlett kernel

		Adj. t-Stat	Prob.*
Phillips-Perron test statistic		-11.90626	0.0001
Test critical values:	1% level	-5.835186	
	5% level	-4.246503	
	10% level	-3.590496	

*MacKinnon (1996) one-sided p-values.
Warning: Probabilities and critical values calculated for 20 observations
and may not be accurate for a sample size of 8

Residual variance (no correction)	0.003318
HAC corrected variance (Bartlett kernel)	0.000674

Phillips-Perron Test Equation
Dependent Variable: D(ICPI,3)
Method: Least Squares
Date: 10/01/20 Time: 21:10
Sample (adjusted): 2010 2017
Included observations: 8 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
D(ICPI(-1),2)	-1.567079	0.260270	-6.020970	0.0018
C	0.117021	0.077496	1.510018	0.1914
@TREND("2007")	-0.016618	0.011247	-1.477550	0.1996

R-squared	0.883629	Mean dependent var	0.012962
Adjusted R-squared	0.837081	S.D. dependent var	0.180510
S.E. of regression	0.072860	Akaike info criterion	-2.120565
Sum squared resid	0.026543	Schwarz criterion	-2.090775
Log likelihood	11.48226	Hannan-Quinn criter.	-2.321491
F-statistic	18.98302	Durbin-Watson stat	1.963798
Prob(F-statistic)	0.004620		

Cashless Payment Cheque Phillips-Perron test On Level with intercept

Null Hypothesis: ICHEQUES has a unit root

Exogenous: Constant
Bandwidth: 3 (Newey-West automatic) using Bartlett kernel

		Adj. t-Stat	Prob.*
Phillips-Perron test statistic		-3.486687	0.0332
Test critical values:	1% level	-4.297073	
	5% level	-3.212696	
	10% level	-2.747676	

*MacKinnon (1996) one-sided p-values.
Warning: Probabilities and critical values calculated for 20 observations
and may not be accurate for a sample size of 10

Residual variance (no correction)	0.988763
HAC corrected variance (Bartlett kernel)	0.641233

Phillips-Perron Test Equation
Dependent Variable: D(ICHEQUES)
Method: Least Squares
Date: 10/01/20 Time: 21:15
Sample (adjusted): 2008 2017
Included observations: 10 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
ICHEQUES(-1)	-1.167611	0.348030	-3.354912	0.0100
C	16.43110	4.911989	3.345102	0.0102

R-squared	0.584533	Mean dependent var	-0.005927
Adjusted R-squared	0.532600	S.D. dependent var	1.626134
S.E. of regression	1.111734	Akaike info criterion	3.226576
Sum squared resid	9.887627	Schwarz criterion	3.287093
Log likelihood	-14.13288	Hannan-Quinn criter.	3.160189
F-statistic	11.25544	Durbin-Watson stat	2.060263
Prob(F-statistic)	0.010007		

Cashless Payment Cheque Phillips-Perron test On Level with Trend and intercept

Null Hypothesis: ICHEQUES has a unit root
Exogenous: Constant, Linear Trend
Bandwidth: 4 (Newey-West automatic) using Bartlett kernel

		Adj. t-Stat	Prob.*
Phillips-Perron test statistic		-3.428746	0.1047
Test critical values:	1% level	-5.295384	
	5% level	-4.008157	
	10% level	-3.460791	

*MacKinnon (1996) one-sided p-values.
Warning: Probabilities and critical values calculated for 20 observations
and may not be accurate for a sample size of 10

Residual variance (no correction)	0.977207
HAC corrected variance (Bartlett kernel)	0.438249

Phillips-Perron Test Equation
Dependent Variable: D(ICHEQUES)
Method: Least Squares
Date: 10/01/20 Time: 21:16
Sample (adjusted): 2008 2017
Included observations: 10 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
ICHEQUES(-1)	-1.185278	0.374942	-3.161232	0.0159
C	16.88848	5.457034	3.094809	0.0174
@TREND("2007")	-0.037939	0.131862	-0.287715	0.7819

R-squared	0.589389	Mean dependent var	-0.005927
Adjusted R-squared	0.472071	S.D. dependent var	1.626134
S.E. of regression	1.181528	Akaike info criterion	3.414820
Sum squared resid	9.772065	Schwarz criterion	3.505595
Log likelihood	-14.07410	Hannan-Quinn criter.	3.315239
F-statistic	5.023876	Durbin-Watson stat	2.056240
Prob(F-statistic)	0.044362		

Cashless Payment Cheque Phillips-Perron test 1st Level with intercept

Null Hypothesis: D(ICHEQUES) has a unit root
Exogenous: Constant
Bandwidth: 8 (Newey-West automatic) using Bartlett kernel

		Adj. t-Stat	Prob.*
Phillips-Perron test statistic		-8.960724	0.0001
Test critical values:	1% level	-4.420595	
	5% level	-3.259808	
	10% level	-2.771129	

*MacKinnon (1996) one-sided p-values.
Warning: Probabilities and critical values calculated for 20 observations
and may not be accurate for a sample size of 9

Residual variance (no correction)	1.947122
HAC corrected variance (Bartlett kernel)	0.311680

Phillips-Perron Test Equation

Dependent Variable: D(ICHEQUES,2)
Method: Least Squares
Date: 10/01/20 Time: 21:17
Sample (adjusted): 2009 2017
Included observations: 9 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
D(ICHEQUES(-1))	-1.513431	0.324337	-4.666228	0.0023
C	-0.011327	0.527410	-0.021477	0.9835

R-squared	0.756722	Mean dependent var	-0.006303
Adjusted R-squared	0.721968	S.D. dependent var	3.000694
S.E. of regression	1.582227	Akaike info criterion	3.948674
Sum squared resid	17.52410	Schwarz criterion	3.992502
Log likelihood	-15.76903	Hannan-Quinn criter.	3.854094
F-statistic	21.77369	Durbin-Watson stat	2.376853
Prob(F-statistic)	0.002298		

Cashless Payment Cheque Phillips-Perron test 1st Level with Trend and intercept

Null Hypothesis: D(ICHEQUES) has a unit root
Exogenous: Constant, Linear Trend
Bandwidth: 8 (Newey-West automatic) using Bartlett kernel

		Adj. t-Stat	Prob.*
Phillips-Perron test statistic		-9.238580	0.0003
Test critical values:	1% level	-5.521860	
	5% level	-4.107833	
	10% level	-3.515047	

*MacKinnon (1996) one-sided p-values.
Warning: Probabilities and critical values calculated for 20 observations
and may not be accurate for a sample size of 9

Residual variance (no correction)	1.917150
HAC corrected variance (Bartlett kernel)	0.236061

Phillips-Perron Test Equation
Dependent Variable: D(ICHEQUES,2)
Method: Least Squares
Date: 10/01/20 Time: 21:17
Sample (adjusted): 2009 2017
Included observations: 9 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
D(ICHEQUES(-1))	-1.520830	0.348456	-4.364485	0.0047
C	-0.414630	1.433005	-0.289343	0.7821
@TREND("2007")	0.067213	0.219454	0.306273	0.7697

R-squared	0.760467	Mean dependent var	-0.006303
Adjusted R-squared	0.680623	S.D. dependent var	3.000694
S.E. of regression	1.695796	Akaike info criterion	4.155383
Sum squared resid	17.25435	Schwarz criterion	4.221125
Log likelihood	-15.69923	Hannan-Quinn criter.	4.013513
F-statistic	9.524371	Durbin-Watson stat	2.407087
Prob(F-statistic)	0.013743		

Cashless Payment Card and E-money Phillips-Perron test On Level with intercept

Null Hypothesis: ICARD has a unit root
Exogenous: Constant
Bandwidth: 9 (Newey-West automatic) using Bartlett kernel

		Adj. t-Stat	Prob.*
Phillips-Perron test statistic		-6.589936	0.0005
Test critical values:	1% level	-4.297073	
	5% level	-3.212696	
	10% level	-2.747676	

*MacKinnon (1996) one-sided p-values.
Warning: Probabilities and critical values calculated for 20 observations
and may not be accurate for a sample size of 10

Residual variance (no correction)	0.000586
HAC corrected variance (Bartlett kernel)	6.75E-05

Phillips-Perron Test Equation
Dependent Variable: D(ICARD)
Method: Least Squares
Date: 10/01/20 Time: 21:12
Sample (adjusted): 2008 2017
Included observations: 10 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
ICARD(-1)	-0.066792	0.028438	-2.348687	0.0468
C	0.876744	0.328610	2.668037	0.0284

R-squared	0.408123	Mean dependent var	0.105204
Adjusted R-squared	0.334139	S.D. dependent var	0.033179
S.E. of regression	0.027075	Akaike info criterion	-4.203592
Sum squared resid	0.005864	Schwarz criterion	-4.143075
Log likelihood	23.01796	Hannan-Quinn criter.	-4.269979
F-statistic	5.516332	Durbin-Watson stat	2.726676
Prob(F-statistic)	0.046777		

Cashless Payment Card and E-money Phillips-Perron test On Level with Trend and intercept

Null Hypothesis: ICARD has a unit root
Exogenous: Constant, Linear Trend
Bandwidth: 9 (Newey-West automatic) using Bartlett kernel

		Adj. t-Stat	Prob.*
Phillips-Perron test statistic		-3.634195	0.0807
Test critical values:	1% level	-5.295384	
	5% level	-4.008157	
	10% level	-3.460791	

*MacKinnon (1996) one-sided p-values.
Warning: Probabilities and critical values calculated for 20 observations
and may not be accurate for a sample size of 10

Residual variance (no correction)	0.000393
HAC corrected variance (Bartlett kernel)	5.54E-05

Phillips-Perron Test Equation
Dependent Variable: D(ICARD)
Method: Least Squares
Date: 10/01/20 Time: 21:13
Sample (adjusted): 2008 2017
Included observations: 10 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
ICARD(-1)	-0.470539	0.218757	-2.150967	0.0685
C	5.306299	2.401705	2.209388	0.0629
@TREND("2007")	0.042596	0.022930	1.857696	0.1056

R-squared	0.603567	Mean dependent var	0.105204
Adjusted R-squared	0.490300	S.D. dependent var	0.033179
S.E. of regression	0.023688	Akaike info criterion	-4.404383
Sum squared resid	0.003928	Schwarz criterion	-4.313607
Log likelihood	25.02191	Hannan-Quinn criter.	-4.503963
F-statistic	5.328729	Durbin-Watson stat	2.432087
Prob(F-statistic)	0.039228		

Cashless Payment Card and E-money Phillips-Perron test 1st Level with intercept

Null Hypothesis: D(ICARD) has a unit root
Exogenous: Constant
Bandwidth: 0 (Newey-West automatic) using Bartlett kernel

		Adj. t-Stat	Prob.*
Phillips-Perron test statistic		-3.663909	0.0283
Test critical values:	1% level	-4.420595	
	5% level	-3.259808	
	10% level	-2.771129	

*MacKinnon (1996) one-sided p-values.
Warning: Probabilities and critical values calculated for 20 observations and may not be accurate for a sample size of 9

Residual variance (no correction)	0.000661
HAC corrected variance (Bartlett kernel)	0.000661

Phillips-Perron Test Equation
Dependent Variable: D(ICARD,2)
Method: Least Squares
Date: 10/01/20 Time: 21:14
Sample (adjusted): 2009 2017
Included observations: 9 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
D(ICARD(-1))	-1.073472	0.292986	-3.663909	0.0080
C	0.106362	0.032371	3.285724	0.0134

R-squared	0.657270	Mean dependent var	-0.006770
Adjusted R-squared	0.608308	S.D. dependent var	0.046590
S.E. of regression	0.029159	Akaike info criterion	-4.038993
Sum squared resid	0.005952	Schwarz criterion	-3.995165
Log likelihood	20.17547	Hannan-Quinn criter.	-4.133573
F-statistic	13.42423	Durbin-Watson stat	1.588538
Prob(F-statistic)	0.008029		

Cashless Payment Card and E-money Phillips-Perron test 1st Level with Trend and intercept

Null Hypothesis: D(ICARD) has a unit root
Exogenous: Constant, Linear Trend
Bandwidth: 5 (Newey-West automatic) using Bartlett kernel

		Adj. t-Stat	Prob.*
Phillips-Perron test statistic		-6.705309	0.0032
Test critical values:	1% level	-5.521860	
	5% level	-4.107833	
	10% level	-3.515047	

*MacKinnon (1996) one-sided p-values.
Warning: Probabilities and critical values calculated for 20 observations and may not be accurate for a sample size of 9

Residual variance (no correction)	0.000413
HAC corrected variance (Bartlett kernel)	0.000116

Phillips-Perron Test Equation
Dependent Variable: D(ICARD,2)
Method: Least Squares
Date: 10/01/20 Time: 21:15
Sample (adjusted): 2009 2017
Included observations: 9 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
D(ICARD(-1))	-1.507525	0.338832	-4.449183	0.0043
C	0.201705	0.057313	3.519368	0.0125
@TREND("2007")	-0.008267	0.004353	-1.898856	0.1063

R-squared	0.785920	Mean dependent var	-0.006770
Adjusted R-squared	0.714560	S.D. dependent var	0.046590
S.E. of regression	0.024892	Akaike info criterion	-4.287363
Sum squared resid	0.003718	Schwarz criterion	-4.221621
Log likelihood	22.29313	Hannan-Quinn criter.	-4.429233
F-statistic	11.01343	Durbin-Watson stat	1.556683
Prob(F-statistic)	0.009811		

Cashless Payment Direct Debit Phillips-Perron test On Level with intercept

Null Hypothesis: IDIRECT has a unit root
Exogenous: Constant
Bandwidth: 1 (Newey-West automatic) using Bartlett kernel

		Adj. t-Stat	Prob.*
Phillips-Perron test statistic		0.575744	0.9796
Test critical values:	1% level	-4.297073	
	5% level	-3.212696	
	10% level	-2.747676	

*MacKinnon (1996) one-sided p-values.
Warning: Probabilities and critical values calculated for 20 observations
and may not be accurate for a sample size of 10

Residual variance (no correction)	0.038621
HAC corrected variance (Bartlett kernel)	0.052150

Phillips-Perron Test Equation
Dependent Variable: D(IDIRECT)
Method: Least Squares
Date: 10/01/20 Time: 21:21

Sample (adjusted): 2008 2017
Included observations: 10 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
IDIRECT(-1)	0.090505	0.107979	0.838177	0.4263
C	-0.624167	0.975838	-0.639622	0.5403

R-squared	0.080728	Mean dependent var	0.191682
Adjusted R-squared	-0.034181	S.D. dependent var	0.216058
S.E. of regression	0.219719	Akaike info criterion	-0.016078
Sum squared resid	0.386212	Schwarz criterion	0.044439
Log likelihood	2.080391	Hannan-Quinn criter.	-0.082465
F-statistic	0.702541	Durbin-Watson stat	1.276344
Prob(F-statistic)	0.426263		

Cashless Payment Direct Debit Phillips-Perron test On Level with Trend and intercept

Null Hypothesis: IDIRECT has a unit root
Exogenous: Constant, Linear Trend
Bandwidth: 9 (Newey-West automatic) using Bartlett kernel

		Adj. t-Stat	Prob.*
Phillips-Perron test statistic		-2.576503	0.2962
Test critical values:	1% level	-5.295384	
	5% level	-4.008157	
	10% level	-3.460791	

*MacKinnon (1996) one-sided p-values.
Warning: Probabilities and critical values calculated for 20 observations
and may not be accurate for a sample size of 10

Residual variance (no correction)	0.021154
HAC corrected variance (Bartlett kernel)	0.003372

Phillips-Perron Test Equation
Dependent Variable: D(IDIRECT)
Method: Least Squares
Date: 10/01/20 Time: 21:22
Sample (adjusted): 2008 2017
Included observations: 10 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
IDIRECT(-1)	-0.380381	0.213686	-1.780094	0.1183
C	2.987579	1.689087	1.768754	0.1203
@TREND("2007")	0.115090	0.047872	2.404139	0.0472

R-squared	0.496482	Mean dependent var	0.191682

Adjusted R-squared	0.352620	S.D. dependent var	0.216058
S.E. of regression	0.173840	Akaike info criterion	-0.418040
Sum squared resid	0.211542	Schwarz criterion	-0.327265
Log likelihood	5.090202	Hannan-Quinn criter.	-0.517621
F-statistic	3.451092	Durbin-Watson stat	1.595010
Prob(F-statistic)	0.090584		

Cashless Payment Direct Debit Phillips-Perron test 1st Level with intercept

Null Hypothesis: D(IDIRECT) has a unit root
Exogenous: Constant
Bandwidth: 8 (Newey-West automatic) using Bartlett kernel

		Adj. t-Stat	Prob.*
Phillips-Perron test statistic		-1.387249	0.5400
Test critical values:	1% level	-4.420595	
	5% level	-3.259808	
	10% level	-2.771129	

*MacKinnon (1996) one-sided p-values.
Warning: Probabilities and critical values calculated for 20 observations
and may not be accurate for a sample size of 9

Residual variance (no correction)	0.035467
HAC corrected variance (Bartlett kernel)	0.010648

Phillips-Perron Test Equation
Dependent Variable: D(IDIRECT,2)
Method: Least Squares
Date: 10/01/20 Time: 21:22
Sample (adjusted): 2009 2017
Included observations: 9 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
D(IDIRECT(-1))	-0.554284	0.330392	-1.677658	0.1373
C	0.122651	0.094156	1.302646	0.2339

R-squared	0.286772	Mean dependent var	0.019254
Adjusted R-squared	0.184883	S.D. dependent var	0.236525
S.E. of regression	0.213544	Akaike info criterion	-0.056818
Sum squared resid	0.319207	Schwarz criterion	-0.012991
Log likelihood	2.255682	Hannan-Quinn criter.	-0.151398
F-statistic	2.814537	Durbin-Watson stat	1.686460
Prob(F-statistic)	0.137313		

Cashless Payment Direct Debit Phillips-Perron test 1st Level with Trend and intercept

Null Hypothesis: D(IDIRECT,2) has a unit root

Null Hypothesis: D(IDIRECT) has a unit root
Exogenous: Constant, Linear Trend
Bandwidth: 5 (Newey-West automatic) using Bartlett kernel

		Adj. t-Stat	Prob.*
Phillips-Perron test statistic		-1.475408	0.7599
Test critical values:	1% level	-5.521860	
	5% level	-4.107833	
	10% level	-3.515047	

*MacKinnon (1996) one-sided p-values.
Warning: Probabilities and critical values calculated for 20 observations
and may not be accurate for a sample size of 9

Residual variance (no correction)	0.031824
HAC corrected variance (Bartlett kernel)	0.013896

Phillips-Perron Test Equation
Dependent Variable: D(IDIRECT,2)
Method: Least Squares
Date: 10/01/20 Time: 21:22
Sample (adjusted): 2009 2017
Included observations: 9 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
D(IDIRECT(-1))	-0.745232	0.409087	-1.821698	0.1183
C	-0.011472	0.188334	-0.060912	0.9534
@TREND("2007")	0.028290	0.034135	0.828785	0.4389

R-squared	0.360036	Mean dependent var	0.019254
Adjusted R-squared	0.146715	S.D. dependent var	0.236525
S.E. of regression	0.218486	Akaike info criterion	0.057015
Sum squared resid	0.286418	Schwarz criterion	0.122757
Log likelihood	2.743432	Hannan-Quinn criter.	-0.084855
F-statistic	1.687763	Durbin-Watson stat	1.639860
Prob(F-statistic)	0.262100		

Cashless Payment Direct Debit Phillips-Perron test 2nd Level with intercept

Exogenous: Constant
Bandwidth: 7 (Newey-West automatic) using Bartlett kernel

		Adj. t-Stat	Prob.*
Phillips-Perron test statistic		-3.083068	0.0686
Test critical values:	1% level	-4.582648	
	5% level	-3.320969	
	10% level	-2.801384	

*MacKinnon (1996) one-sided p-values.
Warning: Probabilities and critical values calculated for 20 observations
and may not be accurate for a sample size of 8

Residual variance (no correction)	0.054155
HAC corrected variance (Bartlett kernel)	0.012666

Phillips-Perron Test Equation
Dependent Variable: D(IDIRECT,3)
Method: Least Squares
Date: 10/01/20 Time: 21:23
Sample (adjusted): 2010 2017
Included observations: 8 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
D(IDIRECT(-1),2)	-1.031351	0.402847	-2.560153	0.0429
C	0.033929	0.095549	0.355093	0.7347

R-squared	0.522079	Mean dependent var	0.007853
Adjusted R-squared	0.442426	S.D. dependent var	0.359863
S.E. of regression	0.268713	Akaike info criterion	0.421973
Sum squared resid	0.433241	Schwarz criterion	0.441834
Log likelihood	0.312106	Hannan-Quinn criter.	0.288023
F-statistic	6.554385	Durbin-Watson stat	2.015454
Prob(F-statistic)	0.042900		

Cashless Payment Direct Debit Phillips-Perron test 2nd Level with Trend and intercept

Null Hypothesis: D(IDIRECT,2) has a unit root
Exogenous: Constant, Linear Trend
Bandwidth: 7 (Newey-West automatic) using Bartlett kernel

		Adj. t-Stat	Prob.*
Phillips-Perron test statistic		-3.378479	0.1286
Test critical values:	1% level	-5.835186	
	5% level	-4.246503	
	10% level	-3.590496	

*MacKinnon (1996) one-sided p-values.
Warning: Probabilities and critical values calculated for 20 observations
and may not be accurate for a sample size of 8

Residual variance (no correction)	0.051689
HAC corrected variance (Bartlett kernel)	0.006809

Phillips-Perron Test Equation
Dependent Variable: D(IDIRECT,3)
Method: Least Squares
Date: 10/01/20 Time: 21:23
Sample (adjusted): 2010 2017
Included observations: 8 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
D(IDIRECT(-1),2)	-1.040459	0.431535	-2.411066	0.0608
C	0.175172	0.306723	0.571106	0.5926
@TREND("2007")	-0.021694	0.044416	-0.488433	0.6459

R-squared	0.543844	Mean dependent var	0.007853
Adjusted R-squared	0.361382	S.D. dependent var	0.359863
S.E. of regression	0.287580	Akaike info criterion	0.625363
Sum squared resid	0.413511	Schwarz criterion	0.655154
Log likelihood	0.498546	Hannan-Quinn criter.	0.424438
F-statistic	2.980582	Durbin-Watson stat	2.131837
Prob(F-statistic)	0.140535		

Government Size Phillips-Perron test On Level with intercept

Null Hypothesis: IGOV has a unit root
Exogenous: Constant
Bandwidth: 1 (Newey-West automatic) using Bartlett kernel

		Adj. t-Stat	Prob.*
Phillips-Perron test statistic		-1.840963	0.3425
Test critical values:	1% level	-4.297073	
	5% level	-3.212696	
	10% level	-2.747676	

*MacKinnon (1996) one-sided p-values.
Warning: Probabilities and critical values calculated for 20 observations
and may not be accurate for a sample size of 10

Residual variance (no correction)	0.001774
HAC corrected variance (Bartlett kernel)	0.001489

Phillips-Perron Test Equation
Dependent Variable: D(IGOV)
Method: Least Squares
Date: 10/01/20 Time: 21:26
Sample (adjusted): 2008 2017
Included observations: 10 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
IGOV(-1)	-0.456382	0.245016	-1.862661	0.0995
C	1.169666	0.625361	1.870387	0.0983

R-squared	0.302498	Mean dependent var	0.005162
Adjusted R-squared	0.215311	S.D. dependent var	0.053159
S.E. of regression	0.047090	Akaike info criterion	-3.096655
Sum squared resid	0.017740	Schwarz criterion	-3.036138
Log likelihood	17.48328	Hannan-Quinn criter.	-3.163042
F-statistic	3.469505	Durbin-Watson stat	2.015525
Prob(F-statistic)	0.099523		

Government Size Phillips-Perron test On Level with Trend and intercept

Null Hypothesis: IGOV has a unit root
Exogenous: Constant, Linear Trend
Bandwidth: 0 (Newey-West automatic) using Bartlett kernel

		Adj. t-Stat	Prob.*
Phillips-Perron test statistic		-0.934184	0.9047
Test critical values:	1% level	-5.295384	
	5% level	-4.008157	
	10% level	-3.460791	

*MacKinnon (1996) one-sided p-values.
Warning: Probabilities and critical values calculated for 20 observations
and may not be accurate for a sample size of 10

Residual variance (no correction)	0.001568
HAC corrected variance (Bartlett kernel)	0.001568

Phillips-Perron Test Equation
Dependent Variable: D(IGOV)
Method: Least Squares
Date: 10/01/20 Time: 21:27
Sample (adjusted): 2008 2017
Included observations: 10 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
IGOV(-1)	-0.284465	0.304507	-0.934184	0.3813
C	0.765011	0.756822	1.010821	0.3458
@TREND("2007")	-0.006183	0.006443	-0.959661	0.3692

R-squared	0.383595	Mean dependent var	0.005162
Adjusted R-squared	0.207479	S.D. dependent var	0.053159
S.E. of regression	0.047324	Akaike info criterion	-3.020256
Sum squared resid	0.015677	Schwarz criterion	-2.929481
Log likelihood	18.10128	Hannan-Quinn criter.	-3.119837
F-statistic	2.178086	Durbin-Watson stat	2.698360
Prob(F-statistic)	0.183879		

Government Size Phillips-Perron test 1st Level with intercept

Null Hypothesis: D(IGOV) has a unit root
Exogenous: Constant
Bandwidth: 1 (Newey-West automatic) using Bartlett kernel

		Adj. t-Stat	Prob.*
Phillips-Perron test statistic		-2.935684	0.0791
Test critical values:	1% level	-4.420595	
	5% level	-3.259808	
	10% level	-2.771129	

*MacKinnon (1996) one-sided p-values.
Warning: Probabilities and critical values calculated for 20 observations
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Residual variance (no correction)	0.002768
HAC corrected variance (Bartlett kernel)	0.002996

Phillips-Perron Test Equation
Dependent Variable: D(IGOV,2)
Method: Least Squares
Date: 10/01/20 Time: 21:27
Sample (adjusted): 2009 2017
Included observations: 9 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
D(IGOV(-1))	-1.128394	0.385351	-2.928226	0.0221
C	0.007514	0.020200	0.371973	0.7209

R-squared	0.550548	Mean dependent var	-0.002863
Adjusted R-squared	0.486340	S.D. dependent var	0.083242
S.E. of regression	0.059659	Akaike info criterion	-2.607203
Sum squared resid	0.024915	Schwarz criterion	-2.563375
Log likelihood	13.73241	Hannan-Quinn criter.	-2.701783
F-statistic	8.574510	Durbin-Watson stat	1.201880
Prob(F-statistic)	0.022080		

Government Size Phillips-Perron test 1st Level with Trend and intercept

Null Hypothesis: D(IGDP) has a unit root
Exogenous: Constant, Linear Trend
Bandwidth: 5 (Newey-West automatic) using Bartlett kernel

		Adj. t-Stat	Prob.*
Phillips-Perron test statistic		-4.879089	0.0204
Test critical values:	1% level	-5.521860	
	5% level	-4.107833	

	10% level	-3.515047	

*MacKinnon (1996) one-sided p-values.
Warning: Probabilities and critical values calculated for 20 observations
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Residual variance (no correction)	0.009851
HAC corrected variance (Bartlett kernel)	0.002714

Phillips-Perron Test Equation
Dependent Variable: D(IGDP,2)
Method: Least Squares
Date: 10/01/20 Time: 21:26
Sample (adjusted): 2009 2017
Included observations: 9 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
D(IGDP(-1))	-1.364337	0.381471	-3.576514	0.0117
C	0.119611	0.116461	1.027047	0.3440
@TREND("2007")	-0.014354	0.017210	-0.834024	0.4362

R-squared	0.688716	Mean dependent var	-0.012608
Adjusted R-squared	0.584955	S.D. dependent var	0.188685
S.E. of regression	0.121559	Akaike info criterion	-1.115638
Sum squared resid	0.088659	Schwarz criterion	-1.049896
Log likelihood	8.020369	Hannan-Quinn criter.	-1.257508
F-statistic	6.637511	Durbin-Watson stat	1.462905
Prob(F-statistic)	0.030163		

Democracy Phillips-Perron test On Level with intercept

Null Hypothesis: IDACL has a unit root
Exogenous: Constant
Bandwidth: 1 (Newey-West automatic) using Bartlett kernel

		Adj. t-Stat	Prob.*
Phillips-Perron test statistic		-1.105104	0.6680
Test critical values:	1% level	-4.297073	
	5% level	-3.212696	
	10% level	-2.747676	

*MacKinnon (1996) one-sided p-values.
Warning: Probabilities and critical values calculated for 20 observations
and may not be accurate for a sample size of 10

Residual variance (no correction)	0.001114
HAC corrected variance (Bartlett kernel)	0.001066

Phillips-Perron Test Equation
Dependent Variable: D(IDACL)
Method: Least Squares
Date: 10/01/20 Time: 21:18
Sample (adjusted): 2008 2017
Included observations: 10 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
IDACL(-1)	-0.437881	0.379221	-1.154688	0.2815
C	1.451096	1.266212	1.146013	0.2849

R-squared	0.142854	Mean dependent var	-0.010920
Adjusted R-squared	0.035711	S.D. dependent var	0.038004
S.E. of regression	0.037319	Akaike info criterion	-3.561765
Sum squared resid	0.011142	Schwarz criterion	-3.501248
Log likelihood	19.80882	Hannan-Quinn criter.	-3.628152
F-statistic	1.333303	Durbin-Watson stat	1.692690
Prob(F-statistic)	0.281542		

Democracy Phillips-Perron test On Level with Trend and intercept

Null Hypothesis: IDACL has a unit root
Exogenous: Constant, Linear Trend
Bandwidth: 0 (Newey-West automatic) using Bartlett kernel

		Adj. t-Stat	Prob.*
Phillips-Perron test statistic		-1.852735	0.6063
Test critical values:	1% level	-5.295384	
	5% level	-4.008157	
	10% level	-3.460791	

*MacKinnon (1996) one-sided p-values.
Warning: Probabilities and critical values calculated for 20 observations
and may not be accurate for a sample size of 10

Residual variance (no correction)	0.000837
HAC corrected variance (Bartlett kernel)	0.000837

Phillips-Perron Test Equation
Dependent Variable: D(IDACL)
Method: Least Squares
Date: 10/01/20 Time: 21:18
Sample (adjusted): 2008 2017
Included observations: 10 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.

IDACL(-1)	-0.760595	0.410526	-1.852735	0.1063
C	2.565798	1.383524	1.854538	0.1061
@TREND("2007")	-0.006766	0.004448	-1.521132	0.1720

R-squared	0.355796	Mean dependent var	-0.010920
Adjusted R-squared	0.171737	S.D. dependent var	0.038004
S.E. of regression	0.034587	Akaike info criterion	-3.647356
Sum squared resid	0.008374	Schwarz criterion	-3.556581
Log likelihood	21.23678	Hannan-Quinn criter.	-3.746937
F-statistic	1.933058	Durbin-Watson stat	1.480120
Prob(F-statistic)	0.214577		

Democracy Phillips-Perron test 1stLevel with intercept

Null Hypothesis: D(IDACL) has a unit root
Exogenous: Constant
Bandwidth: 2 (Newey-West automatic) using Bartlett kernel

		Adj. t-Stat	Prob.*
Phillips-Perron test statistic		-4.535862	0.0086
Test critical values:	1% level	-4.420595	
	5% level	-3.259808	
	10% level	-2.771129	

*MacKinnon (1996) one-sided p-values.
Warning: Probabilities and critical values calculated for 20 observations
and may not be accurate for a sample size of 9

Residual variance (no correction)	0.000726
HAC corrected variance (Bartlett kernel)	0.001320

Phillips-Perron Test Equation
Dependent Variable: D(IDACL,2)
Method: Least Squares
Date: 10/01/20 Time: 21:19
Sample (adjusted): 2009 2017
Included observations: 9 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
D(IDACL(-1))	-1.443140	0.276545	-5.218459	0.0012
C	-0.007712	0.010416	-0.740411	0.4831

R-squared	0.795515	Mean dependent var	0.003747
Adjusted R-squared	0.766303	S.D. dependent var	0.063184
S.E. of regression	0.030545	Akaike info criterion	-3.946124
Sum squared resid	0.006531	Schwarz criterion	-3.902296
Log likelihood	19.75756	Hannan-Quinn criter.	-4.040704
F-statistic	27.23232	Durbin-Watson stat	0.611430
Prob(F-statistic)	0.001228		

Democracy Phillips-Perron test 1st Level with Trend and intercept

Null Hypothesis: D(IDACL) has a unit root
Exogenous: Constant, Linear Trend
Bandwidth: 1 (Newey-West automatic) using Bartlett kernel

		Adj. t-Stat	Prob.*
Phillips-Perron test statistic		-10.22992	0.0002
Test critical values:	1% level	-5.521860	
	5% level	-4.107833	
	10% level	-3.515047	

*MacKinnon (1996) one-sided p-values.
Warning: Probabilities and critical values calculated for 20 observations
and may not be accurate for a sample size of 9

Residual variance (no correction)	0.000178
HAC corrected variance (Bartlett kernel)	0.000172

Phillips-Perron Test Equation
Dependent Variable: D(IDACL,2)
Method: Least Squares
Date: 10/01/20 Time: 21:20
Sample (adjusted): 2009 2017
Included observations: 9 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
D(IDACL(-1))	-1.497367	0.148543	-10.08035	0.0001
C	0.046428	0.013786	3.367889	0.0151
@TREND("2007")	-0.009095	0.002118	-4.294014	0.0051

R-squared	0.949796	Mean dependent var	0.003747
Adjusted R-squared	0.933061	S.D. dependent var	0.063184
S.E. of regression	0.016347	Akaike info criterion	-5.128304
Sum squared resid	0.001603	Schwarz criterion	-5.062563
Log likelihood	26.07737	Hannan-Quinn criter.	-5.270174
F-statistic	56.75631	Durbin-Watson stat	1.999397
Prob(F-statistic)	0.000127		

Economy Growth Phillips-Perron test On Level with intercept

Null Hypothesis: IGDP has a unit root
Exogenous: Constant
Bandwidth: 5 (Newey-West automatic) using Bartlett kernel

		Adj. t-Stat	Prob.*
Phillips-Perron test statistic		-2.451799	0.1532
Test critical values:	1% level	-4.297073	
	5% level	-3.212696	
	10% level	-2.747676	

*MacKinnon (1996) one-sided p-values.
Warning: Probabilities and critical values calculated for 20 observations
and may not be accurate for a sample size of 10

Residual variance (no correction)	0.008169
HAC corrected variance (Bartlett kernel)	0.002454

Phillips-Perron Test Equation
Dependent Variable: D(IGDP)
Method: Least Squares
Date: 10/01/20 Time: 21:24
Sample (adjusted): 2008 2017
Included observations: 10 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
IGDP(-1)	-0.412539	0.207112	-1.991861	0.0815
C	3.809907	1.895556	2.009916	0.0793

R-squared	0.331524	Mean dependent var	0.034759
Adjusted R-squared	0.247964	S.D. dependent var	0.116526
S.E. of regression	0.101052	Akaike info criterion	-1.569515
Sum squared resid	0.081691	Schwarz criterion	-1.508998
Log likelihood	9.847577	Hannan-Quinn criter.	-1.635902
F-statistic	3.967512	Durbin-Watson stat	2.219419
Prob(F-statistic)	0.081538		

Economy Growth Phillips-Perron test On Level withTrend and intercept

Null Hypothesis: IGDP has a unit root
Exogenous: Constant, Linear Trend
Bandwidth: 2 (Newey-West automatic) using Bartlett kernel

		Adj. t-Stat	Prob.*
Phillips-Perron test statistic		-1.544004	0.7414
Test critical values:	1% level	-5.295384	
	5% level	-4.008157	
	10% level	-3.460791	

*MacKinnon (1996) one-sided p-values.
Warning: Probabilities and critical values calculated for 20 observations
and may not be accurate for a sample size of 10

Residual variance (no correction)	0.007898
HAC corrected variance (Bartlett kernel)	0.006951

Phillips-Perron Test Equation
Dependent Variable: D(IGDP)
Method: Least Squares
Date: 10/01/20 Time: 21:24
Sample (adjusted): 2008 2017
Included observations: 10 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
IGDP(-1)	-0.535051	0.331366	-1.614683	0.1504
C	4.883006	2.959417	1.649989	0.1429
@TREND("2007")	0.008729	0.017800	0.490408	0.6388

R-squared	0.353728	Mean dependent var	0.034759
Adjusted R-squared	0.169078	S.D. dependent var	0.116526
S.E. of regression	0.106219	Akaike info criterion	-1.403296
Sum squared resid	0.078978	Schwarz criterion	-1.312520
Log likelihood	10.01648	Hannan-Quinn criter.	-1.502876
F-statistic	1.915673	Durbin-Watson stat	2.008761
Prob(F-statistic)	0.216997		

Economy Growth Phillips-Perron test 1st Level with intercept

Null Hypothesis: D(IGDP) has a unit root
Exogenous: Constant
Bandwidth: 1 (Newey-West automatic) using Bartlett kernel

		Adj. t-Stat	Prob.*
Phillips-Perron test statistic		-3.559616	0.0328
Test critical values:	1% level	-4.420595	
	5% level	-3.259808	
	10% level	-2.771129	

*MacKinnon (1996) one-sided p-values.
Warning: Probabilities and critical values calculated for 20 observations
and may not be accurate for a sample size of 9

Residual variance (no correction)	0.010993
HAC corrected variance (Bartlett kernel)	0.013079

Phillips-Perron Test Equation
Dependent Variable: D(IGDP,2)
Method: Least Squares

Date: 10/01/20 Time: 21:25
Sample (adjusted): 2009 2017
Included observations: 9 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
D(IGDP(-1))	-1.233736	0.340203	-3.626476	0.0084
C	0.029077	0.041262	0.704698	0.5038

R-squared	0.652628	Mean dependent var	-0.012608
Adjusted R-squared	0.603004	S.D. dependent var	0.188685
S.E. of regression	0.118886	Akaike info criterion	-1.228169
Sum squared resid	0.098938	Schwarz criterion	-1.184342
Log likelihood	7.526762	Hannan-Quinn criter.	-1.322749
F-statistic	13.15133	Durbin-Watson stat	1.413737
Prob(F-statistic)	0.008437		

Economy Growth Phillips-Perron test 1st Level withTrend and intercept

Null Hypothesis: D(IGDP) has a unit root
Exogenous: Constant, Linear Trend
Bandwidth: 5 (Newey-West automatic) using Bartlett kernel

		Adj. t-Stat	Prob.*
Phillips-Perron test statistic		-4.879089	0.0204
Test critical values:	1% level	-5.521860	
	5% level	-4.107833	
	10% level	-3.515047	

*MacKinnon (1996) one-sided p-values.
Warning: Probabilities and critical values calculated for 20 observations
and may not be accurate for a sample size of 9

Residual variance (no correction)	0.009851
HAC corrected variance (Bartlett kernel)	0.002714

Phillips-Perron Test Equation
Dependent Variable: D(IGDP,2)
Method: Least Squares
Date: 10/01/20 Time: 21:26
Sample (adjusted): 2009 2017
Included observations: 9 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
D(IGDP(-1))	-1.364337	0.381471	-3.576514	0.0117
C	0.119611	0.116461	1.027047	0.3440
@TREND("2007")	-0.014354	0.017210	-0.834024	0.4362

R-squared	0.688716	Mean dependent var	-0.012608
Adjusted R-squared	0.584955	S.D. dependent var	0.188685
S.E. of regression	0.121559	Akaike info criterion	-1.115638
Sum squared resid	0.088659	Schwarz criterion	-1.049896
Log likelihood	8.020369	Hannan-Quinn criter.	-1.257508
F-statistic	6.637511	Durbin-Watson stat	1.462905
Prob(F-statistic)	0.030163		

Null Hypothesis: ICPI has a unit root
Exogenous: Constant, Linear Trend
Bandwidth: 4 (Newey-West automatic) using Bartlett kernel

		Adj. t-Stat	Prob.*
Phillips-Perron test statistic		-4.987194	0.0146
Test critical values:	1% level	-5.295384	
	5% level	-4.008157	
	10% level	-3.460791	

APPENDIX 4.5.6 Thailand Phillips-Perron test

Corruption Perspective Phillips-Perron test On Level with intercept

Null Hypothesis: ICPI has a unit root
Exogenous: Constant
Bandwidth: 1 (Newey-West automatic) using Bartlett kernel

		Adj. t-Stat	Prob.*
Phillips-Perron test statistic		-2.747582	0.1000
Test critical values:	1% level	-4.297073	
	5% level	-3.212696	
	10% level	-2.747676	

Corruption Perspective Phillips-Perron test On Level with Trend and intercept

Corruption Perspective Phillips-Perron test 1st Level with intercept

Null Hypothesis: D(ICPI) has a unit root
Exogenous: Constant
Bandwidth: 5 (Newey-West automatic) using Bartlett kernel

		Adj. t-Stat	Prob.*
Phillips-Perron test statistic		-9.120351	0.0001
Test critical values:	1% level	-4.420595	
	5% level	-3.259808	
	10% level	-2.771129	

Corruption Perspective Phillips-Perron test 1st Level with Trend and intercept

Null Hypothesis: D(ICPI) has a unit root
Exogenous: Constant, Linear Trend
Bandwidth: 5 (Newey-West automatic) using Bartlett kernel

		Adj. t-Stat	Prob.*
Phillips-Perron test statistic		-9.385965	0.0003
Test critical values:	1% level	-5.521860	
	5% level	-4.107833	
	10% level	-3.515047	

Cashless Payment Cheque Phillips-Perron test On Level with intercept

Null Hypothesis: ICHE has a unit root
Exogenous: Constant
Bandwidth: 5 (Newey-West automatic) using Bartlett kernel

		Adj. t-Stat	Prob.*
Phillips-Perron test statistic		-1.898864	0.3195
Test critical values:	1% level	-4.297073	
	5% level	-3.212696	
	10% level	-2.747676	

Cashless Payment Cheque Phillips-Perron test On Level with Trend and intercept

Null Hypothesis: ICHE has a unit root
Exogenous: Constant, Linear Trend
Bandwidth: 7 (Newey-West automatic) using Bartlett kernel

		Adj. t-Stat	Prob.*

Phillips-Perron test statistic		-1.487316	0.7630

Null Hypothesis: D(ICHE,2) has a unit root

Null Hypothesis: D(ICHE) has a unit root
Exogenous: Constant
Bandwidth: 5 (Newey-West automatic) using Bartlett kernel

		Adj. t-Stat	Prob.*
Phillips-Perron test statistic		-3.023038	0.0700
Test critical values:	1% level	-4.420595	
	5% level	-3.259808	
	10% level	-2.771129	

Test critical values:	1% level	-5.295384	
	5% level	-4.008157	
	10% level	-3.460791	

Cashless Payment Cheque Phillips-Perron test 1st Level with intercept

Cashless Payment Cheque Phillips-Perron test 1st Level with Trend and intercept

Null Hypothesis: D(ICHE) has a unit root
Exogenous: Constant, Linear Trend
Bandwidth: 5 (Newey-West automatic) using Bartlett kernel

		Adj. t-Stat	Prob.*
Phillips-Perron test statistic		-2.650678	0.2749
Test critical values:	1% level	-5.521860	
	5% level	-4.107833	
	10% level	-3.515047	

Cashless Payment Cheque Phillips-Perron test 2nd Level with intercept

Exogenous: Constant
Bandwidth: 7 (Newey-West automatic) using Bartlett kernel

		Adj. t-Stat	Prob.*
Phillips-Perron test statistic		-3.859759	0.0248
Test critical values:	1% level	-4.582648	
	5% level	-3.320969	
	10% level	-2.801384	

Cashless Payment Cheque Phillips-Perron test 2nd

Null Hypothesis: D(ICHE,2) has a unit root
Exogenous: Constant, Linear Trend
Bandwidth: 7 (Newey-West automatic) using Bartlett kernel

		Adj. t-Stat	Prob.*
Phillips-Perron test statistic		-4.510973	0.0381
Test critical values:	1% level	-5.835186	
	5% level	-4.246503	
	10% level	-3.590496	

Level with Trend and intercept

Cashless Payment Card and E-money Phillips-Perron test On Level with intercept

Null Hypothesis: ICARD has a unit root
Exogenous: Constant
Bandwidth: 9 (Newey-West automatic) using Bartlett kernel

		Adj. t-Stat	Prob.*
Phillips-Perron test statistic		-2.040535	0.2677
Test critical values:	1% level	-4.297073	
	5% level	-3.212696	
	10% level	-2.747676	

Cashless Payment Card and E-money Phillips-Perron test On Level with Trend and intercept

Null Hypothesis: ICARD has a unit root
Exogenous: Constant, Linear Trend
Bandwidth: 7 (Newey-West automatic) using Bartlett kernel

Null Hypothesis: D(ICARD) has a unit root
Exogenous: Constant
Bandwidth: 2 (Newey-West automatic) using Bartlett kernel

		Adj. t-Stat	Prob.*
Phillips-Perron test statistic		-3.068478	0.0656
Test critical values:	1% level	-4.420595	
	5% level	-3.259808	
	10% level	-2.771129	

Null Hypothesis: D(ICARD) has a unit root
Exogenous: Constant, Linear Trend
Bandwidth: 8 (Newey-West automatic) using Bartlett kernel

		Adj. t-Stat	Prob.*
Phillips-Perron test statistic		-5.735581	0.0080
Test critical values:	1% level	-5.521860	
	5% level	-4.107833	
	10% level	-3.515047	

		Adj. t-Stat	Prob.*
Phillips-Perron test statistic		-1.085446	0.8760
Test critical values:	1% level	-5.295384	
	5% level	-4.008157	
	10% level	-3.460791	

Cashless Payment Card and E-money Phillips-Perron test 1st Level with intercept

Cashless Payment Card and E-money Phillips-Perron test 1st Level with Trend and intercept

Cashless Payment Direct Debit Phillips-Perron test On Level with intercept

Null Hypothesis: IDEBIT has a unit root
Exogenous: Constant, Linear Trend
Bandwidth: 9 (Newey-West automatic) using Bartlett kernel

		Adj. t-Stat	Prob.*
Phillips-Perron test statistic		-4.573334	0.0245
Test critical values:	1% level	-5.295384	
	5% level	-4.008157	
	10% level	-3.460791	

Null Hypothesis: D(IDEBIT) has a unit root
Exogenous: Constant
Bandwidth: 8 (Newey-West automatic) using Bartlett kernel

		Adj. t-Stat	Prob.*
Phillips-Perron test statistic		-3.670457	0.0281
Test critical values:	1% level	-4.420595	
	5% level	-3.259808	

Null Hypothesis: IDEBIT has a unit root
Exogenous: Constant
Bandwidth: 9 (Newey-West automatic) using Bartlett kernel

		Adj. t-Stat	Prob.*
Phillips-Perron test statistic		0.612854	0.9811
Test critical values:	1% level	-4.297073	
	5% level	-3.212696	
	10% level	-2.747676	

*MacKinnon (1996) one-sided p-values.

Cashless Payment Direct Debit Phillips-Perron test On Level with Trend and intercept

Cashless Payment Direct Debit Phillips-Perron test 1st Level with intercept

	10% level	-2.771129	

Null Hypothesis: IGOV has a unit root
Exogenous: Constant
Bandwidth: 4 (Newey-West automatic) using Bartlett kernel

		Adj. t-Stat	Prob.*
Phillips-Perron test statistic		-4.539091	0.0071
Test critical values:	1% level	-4.297073	
	5% level	-3.212696	

Cashless Payment Direct Debit Phillips-Perron test 1st Level with Trend and intercept

Null Hypothesis: D(IDEBIT) has a unit root

Exogenous: Constant, Linear Trend

Bandwidth: 8 (Newey-West automatic) using Bartlett kernel

		Adj. t-Stat	Prob.*
Phillips-Perron test statistic		-2.730753	0.2529
Test critical values:	1% level	-5.521860	
	5% level	-4.107833	
	10% level	-3.515047	

Government Size Phillips-Perron test On Level with intercept

	10% level	-2.747676	

Null Hypothesis: D(IACL) has a unit root

Government Size Phillips-Perron test On Level with Trend and intercept

Null Hypothesis: IGOV has a unit root
Exogenous: Constant, Linear Trend
Bandwidth: 4 (Newey-West automatic) using Bartlett kernel

		Adj. t-Stat	Prob.*
Phillips-Perron test statistic		-0.494572	0.9587
Test critical values:	1% level	-5.295384	
	5% level	-4.008157	
	10% level	-3.460791	

Democracy Phillips-Perron test On Level with intercept

Null Hypothesis: IACL has a unit root

Exogenous: Constant
Bandwidth: 0 (Newey-West automatic) using Bartlett kernel

		Adj. t-Stat	Prob.*
Phillips-Perron test statistic		-0.807386	0.7719
Test critical values:	1% level	-4.297073	
	5% level	-3.212696	
	10% level	-2.747676	

Democracy Phillips-Perron test On Level with Trend and intercept

Null Hypothesis: IACL has a unit root
Exogenous: Constant, Linear Trend
Bandwidth: 2 (Newey-West automatic) using Bartlett kernel

		Adj. t-Stat	Prob.*
Phillips-Perron test statistic		-1.915100	0.5735
Test critical values:	1% level	-5.295384	
	5% level	-4.008157	
	10% level	-3.460791	

Democracy Phillips-Perron test 1stLevel with intercept

Exogenous: Constant
Bandwidth: 5 (Newey-West automatic) using Bartlett kernel

		Adj. t-Stat	Prob.*
Phillips-Perron test statistic		-3.792498	0.0236
Test critical values:	1% level	-4.420595	
	5% level	-3.259808	
	10% level	-2.771129	

Null Hypothesis: D(IACL) has a unit root
Exogenous: Constant, Linear Trend
Bandwidth: 8 (Newey-West automatic) using Bartlett kernel

		Adj. t-Stat	Prob.*
Phillips-Perron test statistic		-6.712791	0.0032
Test critical values:	1% level	-5.521860	
	5% level	-4.107833	
	10% level	-3.515047	

Democracy Phillips-Perron test 1st Level with Trend and intercept

Economy Growth Phillips-Perron test On Level with intercept

Null Hypothesis: IGDP has a unit root
Exogenous: Constant
Bandwidth: 5 (Newey-West automatic) using Bartlett kernel

		Adj. t-Stat	Prob.*
Phillips-Perron test statistic		-2.197016	0.2177
Test critical values:	1% level	-4.297073	
	5% level	-3.212696	
	10% level	-2.747676	

Economy Growth Phillips-Perron test On Level withTrend and intercept

Null Hypothesis: IGDP has a unit root

Null Hypothesis: D(IGDP) has a unit root
Exogenous: Constant
Bandwidth: 0 (Newey-West automatic) using Bartlett kernel

		Adj. t-Stat	Prob.*
Phillips-Perron test statistic		-3.042397	0.0681
Test critical values:	1% level	-4.420595	
	5% level	-3.259808	
	10% level	-2.771129	

Exogenous: Constant, Linear Trend
Bandwidth: 1 (Newey-West automatic) using Bartlett kernel

		Adj. t-Stat	Prob.*
Phillips-Perron test statistic		-1.633698	0.7045
Test critical values:	1% level	-5.295384	
	5% level	-4.008157	
	10% level	-3.460791	

Economy Growth Phillips-Perron test 1st Level with intercept

Economy Growth Phillips-Perron test 1st Level withTrend and intercept

Null Hypothesis: D(IGDP) has a unit root
Exogenous: Constant, Linear Trend
Bandwidth: 3 (Newey-West automatic) using Bartlett kernel

		Adj. t-Stat	Prob.*
Phillips-Perron test statistic		-2.860456	0.2214
Test critical values:	1% level	-5.521860	
	5% level	-4.107833	
	10% level	-3.515047	