

FX MARKETS CO-MOVEMENT DYNAMICS AND GLOBAL FACTORS: EVIDENCE FROM EMERGING MARKETS

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To my family.

ABSTRACT

Emerging markets are particularly different from developed markets as they possess vulnerability, easily disturbed by financial crises, and not completely liberalized. Some global shocks such as Covid-19 and 2018 global financial crisis easily affect the emerging markets in especially currency-based systems. Therefore, it is important to investigate the impacts of global factors on their currencies in the last few decades.

The main purpose of this thesis is to investigate the effects of global factors on emerging markets between the years of 2009-2021. The cluster was narrowed by PCA analysis and regression analysis was performed on the factors obtained as a result of the analysis. Then, the analysis was made to minimize the average loss that will occur due to restructuring with the factors included in the PCA analysis results and to compare the movements of the currencies of developing countries within themselves with the regression results. Empirical tests are implemented into three different time periods to understand the effects of global factors:

- High Liquidity Market Regime (January 2009 – June 2013)
- Monetary Tightening Market Regime (July 2013 – December 2019)
- The Emerging Markets in Pandemic (January 2020 – August 2021)

The findings show that the currencies of the developing countries are highly correlated with the Dollar Index, MSCI World Index and EURUSD parity, but also it is observed that they are correlated with the commodity markets in times of crisis. On the other hand, even the emerging markets countries do not diverge from each other much

during the global financial crisis, it is analyzed that the currencies of the countries that have difficulties in their domestic monetary and fiscal policies such as Turkey and Argentina are decomposed from the emerging markets currencies in all periods regardless of the type of crises.

Keywords: Emerging market, global factors, principal components analysis, exploratory factor analysis, reconstruction error.



ÖZET

Birçok ülke, son birkaç yılda gelişmekte olan ülke ve pazar kategorisinde yer almaktadır. Bu tür piyasalara gelişen piyasalar denir. Kırılgan olmaları, finansal krizlerden kolayca etkilenmeleri ve tamamen serbestleşmemeleri nedeniyle gelişmiş piyasalardan özellikle farklıdırlar. Covid-19 ve 2018 küresel finans krizi gibi bazı küresel faktörler özellikle para bazlı sistemlerde yükselen piyasaları kolaylıkla etkilemektedir. Bu nedenle, küresel faktörlerin son birkaç yılda para birimleri üzerindeki etkilerini araştırmak önemlidir.

Bu tezin temel amacı, 2009-2021 döneminde küresel faktörlerin gelişmekte olan piyasalar üzerindeki etkilerini araştırmaktır. Gelişmekte olan piyasa para birimleri için veriler 2009 – 2021 arası yılları kapsayacak şekilde toplanmıştır. PCA analizi ile küme daraltılarak, analiz sonucu elde edilen faktörler üzerine regresyon analizi yapılmıştır. Ardından, PCA analiz sonuçlarında yer alan faktörler ile yeniden yapılandırılmaya bağlı olarak oluşacak ortalama hata payının minimize edilmesi ve gelişmekte olan ülke para birimlerinin kendi içlerinde hareketlerinin regresyon sonuçlarıyla karşılaştırılması için analiz yapılmıştır. Global faktörlerin etkilerinin anlaşılması için üç farklı dönem seçilmiştir:

- Yüksek Likidite Rejimi (Ocak 2009 – Haziran 2013)
- Sıkı Para Politikası Rejimi (Temmuz 2013 – Aralık 2019)
- Pandemi Döneminde Gelişmekte Olan Ülkeler (Ocak 2020 – Ağustos 2021)

Bulgular, geliřmekte olan lke para birimlerinin Dolar Endeksi, MSCI Dnya Endeksi ve EURUSD paritesi ile yksek korelasyona sahip olduėunu gstermek ile birlikte, kriz dnemlerinde emtia piyasaları ile de korele olduėunu gstermiřtir. te yandan, geliřmekte olan lkeler kresel Finansal kriz dneminde birbirlerinden ok ayrıřmasa da Arjantin ve Trkiye gibi kendi i parasal ve mali politikalarında sıkıntı yařayan lke para birimlerinin krizlerden baėımsız olarak tm dnemlerde ayrıřtıėı grlmektedir.

Anahtar Kelimeler: Geliřmekte olan piyasa, kresel faktrler, temel bileřenler analizi, aıklayıcı faktr analizi.

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LIST OF SYMBOLS AND ABBREVIATIONS

BRICS	: Brazil, Russia, India, China, South Africa
EFA	: Exploratory Factor Analysis
EM	: Emerging Market
GDP	: Gross Domestic Product
GEM	: Global Emerging Market
PCA	: Principal Components Analysis
WB	: World Bank

CHAPTER I

INTRODUCTION

Emerging market (EM) is a concept that has roots from its first emergence 1970s. Prior to 1970s, less developed country and its market (including financial system) was a concept used to describe any country not as developed as USA, Japan, and Western European countries. However, due to its misleading meaning and patent issues, the terms were replaced with emerging country. Such countries are considered as neither developed nor undeveloped in every level including economic situations.

Antoine Van Agtmael was the first economist in World Bank (WB) started using emerging economies and emerging markets to describe countries not as developed as USA and Japan in early 1980s (Kvint, 2010). Such markets include several countries in Africa, many countries in the Eastern European region, some of Latin American countries, Russia, and some countries in Southeast Asia and Middle East region.

There are various definitions to describe emerging market. Ian Bremmer (political scientist) defined emerging market as “a country where politics matters at least as much as economics to the markets” in one of his speech. Also, Kvint (2010) defined it as “an emerging market country is a society transitioning from a dictatorship to a free-market-oriented-economy, with increasing economic freedom, gradual integration with the Global Marketplace and with other members of the GEM (Global Emerging Market), an expanding middle class, improving standards of living, social stability, and tolerance, as well as an increase in cooperation with multilateral institutions”.

Emerging market could be defined as a country that does not have a financial

system as strong as a developed country. Also, finance systems are not strong and sometimes become unstable due to flow of financial investment for other countries. Their markets and finances are more open to any potential financial crises. Their markets are more volatile. The top emerging countries with the biggest economies (according to GDP nominal peak year) include “China, India, Brazil, Russia, South Korea, Mexico, Indonesia, and Turkey”, respectively as of 2020.

Five major developing countries initiated an assembly in 2009 called ‘BRICS’, which is an acronym including first letters of the members, Brazil, Russia, India, China, South Africa. They are known as regional economic and political impacts. Their main purposes of the mechanism include security, peace, cooperation, and economical collaborations. They’re considered as a group of emerging countries in financial documents.

Identifying the factors that negatively affect global financial markets has been one of the major research areas in the literature of economy and finance (González-Rozada & Yeyati, 2008). It has been an important issue to investigate several key indicators in terms of various asset types including risk in bond yields, foreign exchange rate fluctuation, credit swap movements, and returns of equity prices.

There are four types of global factors including CDS spread, stock exchange indices, FX rates, and EMBI spreads. Such factors affect financial status of countries with positive or negative loadings for financial indicators for countries.

Developing markets have illiquid and volatile features regarding debt, equities, and exchange currencies (Kniphoff, 2016). For example, Kniphoff (2016) showed these characteristics of developing markets compared with developed countries. Developing countries and markets have been suffering from being volatile markets because of trading volume and variance related to the currencies of G-10 countries.

The volatility between developing and developed countries between 1999 and 2016 have been different especially during the crises such as Dotcom crisis, 2008 financial crisis, Greek debt crisis, and Brexit and US elections. Also, most of the transactions for developing countries trades were conducted with US dollar and Euro. (Kniphoff, 2016)

In addition, monetary policy focuses on the price stability for the country currency in addition to other purposes (Büberkökü, 2019). Giving price stability as the primary target in the execution of monetary policy has brought different monetary policy strategies to the agenda (Yiğitbaş, 2009). The main monetary policy strategies to ensure price stability are exchange rate targeting, monetary targeting and inflation targeting.

Each of these targeting helps to set a limit on the value of the national currency. Thus, these targeting also provide a nominal anchor for monetary policy. The features that the nominal anchor selected in monetary policy should have are as follows; that the chosen target can be easily controlled, that it is transparent for the public to understand, that it has a strong relationship with the ultimate goal, namely price stability, that it can be observed at short intervals.

This study was designed to investigate the effects of global factors on emerging market currencies during the different global economic environments. Main goal was to identify the effects with both PCA, the minimal reconstruction error and the regression analysis on the data collected.

In the second chapter of the study, there is Literature Review that includes first a brief introduction, second a description of emerging markets in ways of its characteristics, global factors affected during time and specific emerging markets currencies, and third the impact of Covid-19 on the emerging markets currencies. Then the study focuses on analyzing the global factors that affect the emerging markets currencies' movement with

the methods explained in the third chapter, these are PCA and the minimal reconstruction error approach. Later, the study is divided into three parts and the global factor effects are examined separately for these market regimes. In chapter four and five, the results are shown and discussed.



CHAPTER II

LITERATURE REVIEW

2.1 Introduction

Emerging markets (EM) as being developing markets have been experiencing regional and global crisis for the last two decades. Especially Asian crisis in 1997 and global financial crisis in 2008 affected emerging markets. Emerging markets suffered great loss in their financial stability especially their currencies slumped at great rates. In addition, the Covid-19 pandemic also affected values of their currencies in the last two years. Emerging market foreign exchange rates of their currencies have been hit hard by the global market drops due to the pandemic.

The currencies of six emerging countries have suffered great losses during the Covid-19 pandemic spread across the world. The changes of six important emerging markets' values between January 2020 – August 2021 had dramatically fallen. Argentine Peso suffered a 38% loss against US Dollar in 20 months during the pandemic. Turkish Lira lost 28%, Brazilian Real lost 22%, Peruvian Sol lost 18% and Colombian Peso lost 16% of its values against US Dollar.

2.2 A Description of Emerging Markets

Emerging market is identified as a market with some characteristics of developed countries and having some roots on undeveloped financial systems. However, emerging market does not fully meet the standards of a developed country. Emerging markets have played very critical roles in the finance world that have had great impacts on the world

economy for the last two decades. Especially, China has been the driving force that fueled high economic growth among the emerging markets such as Russia, Turkey, Brazil, and South Africa.

Emerging markets are more unstable and unpredictable than developed markets as their financial systems are unstable in nature (Divecha, Drach, and Stefek, 1992). They are also uncorrelated and not attached with all of stakeholders in the financial system and developed countries' financial systems. On the other hand, emergent markets attract more investors because they have potential for growing and interests' rates are usually higher than developed markets.

Emerging has been a particularly important challenge for finance (Bekaert & Harvey, 2003). Traditional and standard models are not compatible with emerging markets due to their characteristics different from developed markets. Some attempts have been made to better understand and explain emerging markets. Bekaert and Harvey (2003) recently proposed an approach to integrate market liberalization and integration for emerging markets. They investigated any possible financial impacts of the market integrations on real emerging economies.

Emerging markets could fall to a trap of vicious circle due to major capital flow to the emerging markets. Such capital flow is necessary and generally expected situation as a country is on the track of financial integration and economic liberalization process. This capital flow, though, increases asset prices, enhance liquidity, and fast expansion in bank credit. Credit expansion later leads to higher consumptions and could cause a real estate bubble problem. These issues could trigger macroeconomic vulnerability of an emerging state.

Several studies have been conducted on emerging markets from various perspectives and issues (Blanchard et al., 2010; Paul, 2019; Aguiar & Gopinath, 2007;

Fraga, Goldfajn, & Minella, 2003; Mody, 2003). Paul (2019) recently reviewed previous studies and theoretical models on the international marketing strategies in emerging markets. Based on the previous literature reviews and findings of the studies, below world cloud was formed in terms of emerging markets for keyword in the previous articles.

Various crisis has emerged in recent years in emerging markets. Dooley (2000) discussed a type of model for crises on the developing markets. The researcher specified various issues including government credit constraints. Such constraints were intended to collect liquid assets to prevent financial shocks and overconsumptions and to provide financial markets in a state. The study models were designed to populate differentials consistent with speculative financial attacks. It also showed that a financial shock provided capitals to developing markets in states of South America and Asia after 1989.

2.2.1. Characteristics of Emerging Markets

Emerging markets experience various financial challenges in terms of economic stability, exchange currency status, micro, and macroeconomic indicators (Arnold & Quelch, 1998). Their economies have been making a transition from developing to developed countries. They also experience rapid industrialization such as development of secondary and tertiary sectors.

Emerging markets have also other characteristics. They are considered to have potentials to become developed countries. They also show faster economic growth rates than most of the developed countries (Khanna, Palepu, & Sinha, 2005). On the other hand, many of their citizens still live-in poverty. And some companies struggle to access to the global markets and trade barriers.

The main idea and focus of the developing states are to improve the quality of life for their citizens (London and Hart, 2004). The capital in the market is mainly dominated

by some companies and same types of businesses are dominant in public and private sectors. The emerging markets offer more opportunities. The main skills of implementation and organization include early tools of thinking on core businesses.

Emerging markets are considered as hub of entrepreneurship for increasing desire to do well in the markets. They also fill their roles as missing institutions. The emerging markets support capitalism with socialistic area. The wealth is created for regular and local citizens. They focus on creating new jobs and positions for people.

On the other hand, they lack commitment and trust as they are full of contrasts on the main points and objectives with global initiatives including business, political arena, and nonprofit organizations. Procurement process and capability specifications are evolving in the emerging markets. The emerging markets are mostly governed by central decision-making process.

The characteristics of the emerging markets could be listed as follows:

- High income inequalities exist
- Unbranded competition in the market
- Underdeveloped technology is dominant
- Madi infrastructure and distribution channels is weak
- Rapid economic growth potential and low GDP nominal
- Resources issues as shortage
- Rich diversity in the markets
- Highly variable and weak infrastructure are present

2.2.2. Global Factors in Emerging Markets

Global factors or exogeneous factors have been considered as key determinants for borrowing costs of capital for the emerging economies in the last few decades (González-Rozada, & Yeyati, 2008). Financial crisis such as Asian crisis in late 1990s, global financial crisis in 2008, and Greece debt crisis in 2018 affect regionally or globally emerging countries and their markets. Financial Dependent developing countries need external debts to increase their GDP and catch a high economic growth. However, with the crisis across the world, they are vulnerable to economic crisis due to volatile markets and fragile economic structures (Feyen et al., 2015).

Global factors including market sentiment and global liquidity are explanations for high volatility of emerging markets. No external debts and increased economic indicators could reverse any levels of impacts due to global factors. Therefore, emerging economies should take such global factors into account and take some precautions to prevent their economies from collapsing and serious damages.

Bunda, Hamann, and Lall (2009) investigated correlations in market bonds in the emerging countries with the roles of global and local factors. They described such channels origination from mature markets across countries with a provided framework. They showed correlations between countries with averaging correlation coefficient values regarding volatility in the emerging markets. They used data between 1997 and 2008 for external shock and contagion.

2.2.3. Emerging Market Currencies

Emerging market currencies similar to their economic and financial systems have more volatile structure than currencies of developed countries (Frankel & Poonawala, 2010). They are also illiquid. These two factors contribute to certain boundaries that consumers and companies suffer in general terms.

Volatilities in emerging market currencies could be affected by the economic policies of developed countries. In addition, the clout of emerging economy is much smaller than developed economies due to ECB and the Federal Reserve therefore inflows are irregular into emerging market currencies. For example, the Federal Reserve Bank flowed about 7 trillion USD into the emerging markets. during 2008 global financial crisis.

Commodity export industries are also another factor that significantly affect their currencies as their prices equally correlates with the emerging market economies. However, such a trend later brings higher inflations and bust circle afterwards.

Government regulations including capital control play important roles that restrict inflows and outflows from the markets. It is important for the governments to balance the regulations against black market possibilities.

Currencies in the emerging markets could be stabilized if certain precautions are taken such as quantitative easing (QE) by developed countries, which could stabilize emerging market economies through central banks in buying public and private debts from financial credit institutions and banks.

Brazil, Chile, Poland, Mexico, China, Colombia, Hungary, Russia, and Malaysia are emerging countries that had undervalued currencies as of July 2020. On the other hand, Argentina, Turkey, South Africa, Indonesia, and Philippines are developing countries that had emerging currency overvalued. (Ruiz, 2021)

2.3 The Impacts of Covid-19 on the Emerging Markets

Starting in December 2019, the Covid-19 pandemic affect every sector including economy of every country including emerging markets across the world. GDP of the emerging countries have shrunk in this period (Topcu & Gulal, 2020). The Covid-19 pandemic outbreak has spread to 216 countries across the world killing more than 3 million people as of April 2021. For this reason, World Health Organization (WHO) declared a pandemic in March 2020.

Pandemic affected economically every country including labor force, unemployment, currency, supply chain, world trades, consumptions and purchasing behaviors, and most importantly stock markets in emerging and developed countries the most. The economists expect the shole recovery in 2023 from the pandemic economic disaster. Economies of emerging markets have been affected much worse than developed countries as they had volatility in their economic systems.

The emerging countries had to support their economies including employees and employers by distributing capital flows that eventually affected their currency rates. Correspondingly, their currencies are expected to decrease against US dollar.

Some of the emerging countries including Indonesia, Brazil, Poland, Colombia, Hungary, and Russia are expected to have currency rates in 2021 higher than 2020. However, countries including Mexico, South Africa, China, Chile, Malaysia, Indiana, Philippines, and Turkey are expected to lose rates of their currencies against US dollars in the last quarter of 2021 compared to the last quarter of 2020.

Emerging markets with limited capital inflows and slow economic growth rates have been more vulnerable for the Covid-19 pandemic crisis. They have had inadequate resources to deal with pandemic disaster in their economies. Therefore, they are expected to suffer most.

Topcu and Gulal (2020) in a Recent study showed that although Covid-19 pandemic crisis hit the emerging markets the worst, their recoveries started as of the end of 2020. They started recovering by April 2020. With the increasing rates of Corona vaccinations, it is expected that the emerging markets will recovery by the end of 2021.

Also, they found the impacts of the Covid-19 pandemic in the emerging markets of the studied countries in the study were relatively smaller than other nations. They also found that Stimulus packages and Official response times by the governments were significant for the impacts of the pandemic.



CHAPTER II

METHODS

3.1 Compiling the Emerging Markets Currencies and Global Factors

Data

There are two data sets were collected to analyze the effects of global data on emerging market currencies.

First, these two data sets are downloaded on a monthly basis between January 2009 – August 2021. In emerging markets currencies, there are 3496 observations for 23 emerging market currencies which are selected except China and the data set shown as below.

Table 1. Emerging Markets Currencies

Currency Code	Currency Name
USDARS	United States Dollar / Argentine Peso
USDBRL	United States Dollar / Brazilian Real
USDBGN	United States Dollar / Bulgarian Lev
USDCLP	United States Dollar / Chilean Peso
USDCOP	United States Dollar / Colombian Peso
USDCZK	United States Dollar / Czech Koruna
USDHKD	United States Dollar / Hong Kong Dollar
USDHUF	United States Dollar / Hungarian Forint
USDINR	United States Dollar / Indian Rupee
USDIDR	United States Dollar / Indonesian Rupiah
USDMYR	United States Dollar / Malaysian Ringgit
USDMXN	United States Dollar / Mexican Peso
USDPEN	United States Dollar / Peruvian Sol
USDPHP	United States Dollar / Philippine Peso
USDPLN	United States Dollar / Polish Zloty
USDRON	United States Dollar / Romanian Leu
USDRUB	United States Dollar / Russian Ruble
USDSGD	United States Dollar / Singapore Dollar
USDZAR	United States Dollar / South African Rand
USDKRW	United States Dollar / South Korean Won
USDTWD	United States Dollar / Taiwanese Dollar
USDTHB	United States Dollar / Thai Baht
USDTRY	United States Dollar / Turkish Lira

Global factors data set was collected through reports published by some financial institutions including JP Morgan, Bloomberg, MSCI World Index, and BNP Paribas Global Risk Premium Index. Data is also included index prices such as government bonds, basis swaps and volatility index for the global markets between 2009 and 2021.

Total 4077 observations are found for 27 global factors. The purpose is to elaborate more the impacts of global factors on the emerging markets and their currencies.

Data is shown as below.

Table 2. Global Factors Data

Bloomberg Ticker	Index/Currency Name
USGG2YR Index	US 2 Year Government Bond
USGG10YR Index	US 10 Year Government Bond
BCOM Index	Bloomberg Commodity Index
AIJPTMMU Index	JP Morgan US Money Market Trend Index
EUBS1 Curncy	EURUSD 1 Year Basis
EUBS5 Curncy	EURUSD 5 Year Basis
EUBS10 Curncy	EURUSD 10 Year Basis
EURUSD Curncy	EURUSD Currency
VIX Index	Volatility Index
DXY Curncy	Dollar Index
BCOMIN Index	Bloomberg Industrial Metals Subindex
GTDEM1Y Govt	Germany 1 Year Government Bond
GTDEM10Y Govt	Germany 10 Year Government Bond
GTDEM5Y Govt	Germany 5 Year Government Bond
BFCIUS Index	Bloomberg US Financial Conditions Index
BFCIEU Index	Bloomberg Euro-Zone Financial Conditions Index
USGGBE02 Index	US 2 Year Breakeven
USGGBE05 Index	US 5 Year Breakeven
USGGBE10 Index	US 10 Year Breakeven
US0003M Index	ICE USD 3 Month Libor
US0006M Index	ICE USD 6 Month Libor
USGG3M Index	US 3 Month Government Bond
USGG6M Index	US 6 Month Government Bond
BNPSGRP Index	BNP Paribas Global Risk Premium Index
FWISEU55 Index	EUR Inflation 5 Year Swap Forward
MXWO Index	MSCI World Index
MXEU0FN Index	MSCI Europe Financial Index

As the emerging markets are highly vulnerable and showing an immediate response to the global economic conditions, data were reasonably collected.

3.2 Description of Variables

In the first data set, historical prices of the emerging market currencies were collected from January 2009 to August 2021.

The currencies of emerging market cluster is collected in other study which includes global data. The data is initially inspected in Excel to check if missing data existed. Missing data were later eliminated during the process of data analysis. Global market indices were analyzed by XLSTAT then.

This study is separated into three part to investigate the effect the global factors on emerging market currencies. At first part, emerging market currencies were analyzed and clustered with PCA analysis. In the second part, PCA analysis results integrated into the global data set shown above. PCA findings and global factors were regressed and the results were explained. Total 247 regressions are made for the years between January 2009 – August 2021 as some data were missing and mismatched.

3.3. Principal Component Analysis (PCA)

Principal Component Analysis (PCA) is known as an analysis common variance of data in time series. A hypothetical construct or process is not included in PCA. PCA is utilized to increase factor loading with small number of variables and low estimated commonality.

PCA is considered as the first step of explanatory factor analysis statistics. It is used for factor extractions that result in generating maximum possible variance. It is rotated for statistical analysis.

3.4. PCA: The Minimal Reconstruction Error Approach

This thesis also discusses the minimal reconstruction error approach to the principal component analysis method to find a clear response of each emerging markets currencies during the different economic regimes. It is used to minimize the average loss of a data set.



Part 1

In this part, the cluster of emerging markets currencies is narrowed by Principle Component Analysis for the period between January 2009 – August 2021 at first. Then, the same analysis is implemented for the periods these are, high liquidity market regime (January 2009 – June 2013), Monetary Tightening Market Regime (July 2013 – December 2019) and Pandemic (January 2020 – August 2021).

Table 3. Descriptive Statistics of EM Currencies (January 2009 - August 2021)

Currencies	Observations	Minimum	Maximum	Mean	Std. deviation
USDARS	152	-0,131	0,356	0,024	0,060
USDBRL	152	-0,110	0,182	0,006	0,047
USDBGN	152	-0,070	0,084	0,001	0,027
USDCLP	152	-0,077	0,128	0,002	0,033
USDCOP	152	-0,100	0,154	0,004	0,040
USDCZK	152	-0,096	0,135	0,001	0,035
USDHKD	152	-0,005	0,005	0,000	0,001
USDHUF	152	-0,105	0,223	0,004	0,042
USDINR	152	-0,068	0,088	0,003	0,023
USDIDR	152	-0,092	0,139	0,002	0,026
USDMYR	152	-0,072	0,094	0,001	0,022
USDMXN	152	-0,083	0,205	0,003	0,038
USDPEN	152	-0,060	0,053	0,002	0,015
USDPHP	152	-0,032	0,041	0,000	0,015
USDPLN	152	-0,094	0,173	0,002	0,040
USDRON	152	-0,087	0,158	0,003	0,033
USDRUB	152	-0,113	0,215	0,007	0,051
USDSGD	152	-0,041	0,085	0,000	0,017
USDZAR	152	-0,103	0,158	0,004	0,045
USDKRW	152	-0,099	0,112	0,000	0,029
USDTWD	152	-0,039	0,051	-0,001	0,014
USDTHB	152	-0,038	0,051	0,000	0,017
USDTRY	152	-0,078	0,331	0,012	0,045

In the first part of analysis, principal components analysis was conducted. There was a total of 152 valid data implemented in the analysis. Table 1 illustrates first finding from this analysis, descriptive statistics of the study data. Descriptive analysis consists of minimum, maximum, mean scores of the findings as well as standard deviations for the data. The data showed variations in the emerging market currencies between 2009 and

2021.

Figure 1. Eigenvalues of EM Currencies (January 2009 - August 2021) by PCA

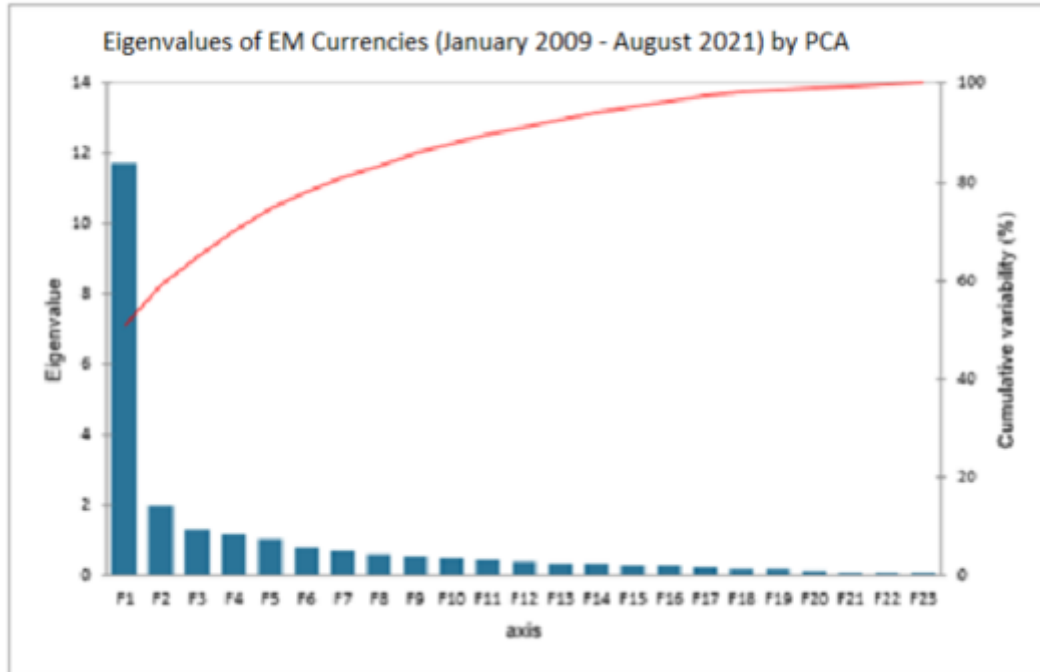


Figure 1. shows the findings of the eigenvalues of the current prices for the emerging markets for the last 12 years. All of the currencies examined in the study are labeled as F1 through F23. All of the eigenvalues for the currencies were found higher than zero or positive, which was acceptable. The eigenvalues which are higher than 1 are considered as subscales of the data set. Five eigenvalues were found to be higher than the value of 1 so the data set had five subscales. On the other hand, some of the variables (F10-F23) had eigenvalues close to 0 that means these items show multicollinearity because all of the variances could be explained with the first 9 variables.

Table 4. shows that PCA analysis (factor loading). According to the data in the Table 4., F1 had maximum variability with the Singapore Dollar, Hungarian Forint and Czech Koruna.

Table 4. Factor Loadings from PCA (January 2009 - August 2021)

	F1	F2	F3	F4	F5
USDARS	0,186	-0,398	0,415	0,610	0,218
USDBRL	0,740	-0,307	-0,070	0,151	0,007
USDBGN	0,797	0,527	-0,004	0,111	-0,037
USDCLP	0,652	-0,201	-0,010	0,025	0,171
USDCOP	0,782	-0,210	-0,219	-0,033	0,248
USDCZK	0,824	0,452	-0,122	0,149	-0,012
USDHKD	0,262	0,201	0,711	-0,178	0,104
USDHUF	0,830	0,395	-0,077	0,175	-0,044
USDINR	0,664	-0,207	0,098	-0,024	-0,477
USDIDR	0,615	-0,372	-0,224	-0,114	-0,239
USDMYR	0,780	-0,205	0,005	-0,188	0,001
USDMXN	0,746	-0,170	-0,249	0,107	-0,083
USDPEN	0,554	-0,195	0,136	-0,264	0,477
USDPHP	0,609	-0,131	0,460	-0,150	-0,363
USDPLN	0,875	0,381	-0,012	0,074	-0,027
USDRON	0,791	0,544	0,002	0,109	-0,029
USDRUB	0,711	-0,060	-0,232	0,147	0,314
USDSGD	0,924	0,017	0,011	-0,160	0,050
USDZAR	0,769	-0,251	-0,061	0,126	0,048
USDKRW	0,797	0,056	0,170	-0,287	0,101
USDTWD	0,768	-0,041	0,133	-0,284	0,129
USDTHB	0,692	-0,246	-0,170	-0,237	-0,237
USDTRY	0,551	-0,221	0,221	0,492	-0,174

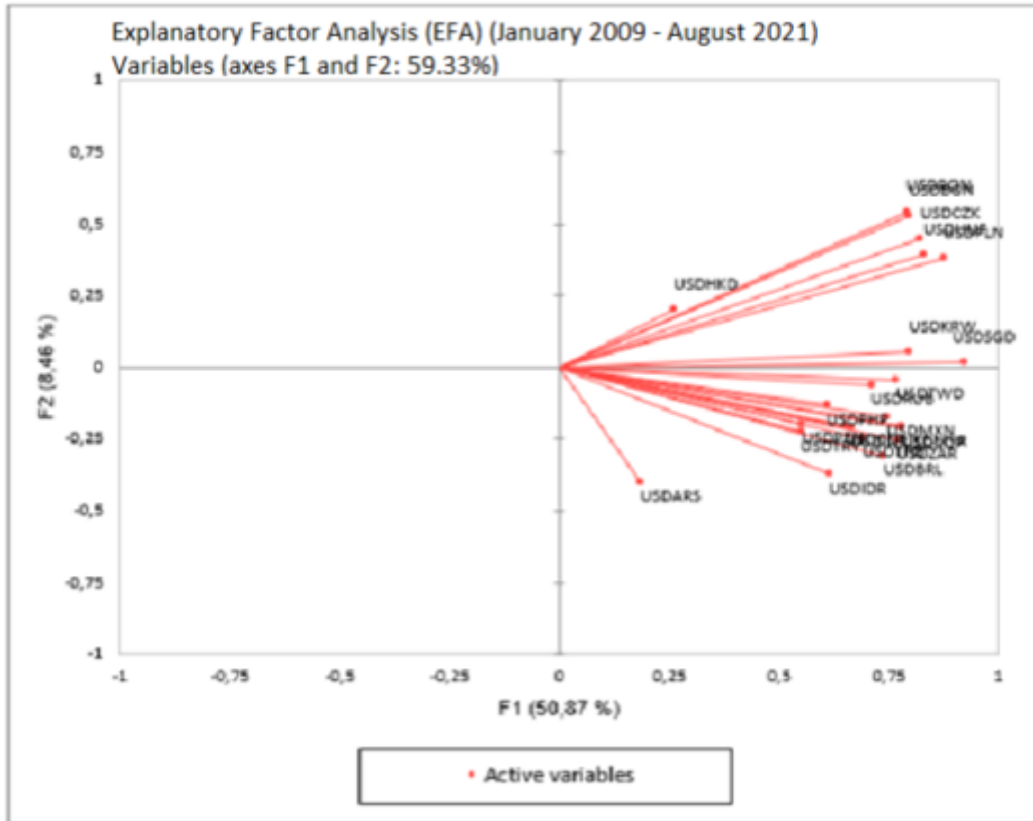
Table 4. summarizes factor loading from the principal factor analysis and principal components analysis. According to the results, most of the currencies (N=14) belonged to factor 1. 1 currency was in the factor 3 from the data and other factors had none.

Table 5. shows the results of the correlation coefficients of the emerging markets' currencies conducted. Bulgarian Lev and, Hungarian Forint and Czech Koruna have the greatest number of high positive correlations ($r < +0,70$) with other emerging markets' currencies.

Table 5. Correlation Coefficients of the EM Currencies (January 2009 - August 2021)

Variables	USDARS	USDBRL	USDBGN	USDCPL	USDCOP	USDCZK	USDHKD	USDHUF	USDINR	USDIDR	USDMYR	USDMXN	USDPEN	USDPHP	USDPLN	USDRON	USORUB	USDOSD	USDZAR	USDKRW	USDTHB	USDTRY	
USDARS	1																						
USDBRL	0.264	1																					
USDBGN	0.002	0.482	1																				
USDCPL	0.141	0.557	0.436	1																			
USDCOP	0.136	0.663	0.499	0.541	1																		
USDCZK	0.046	0.508	0.919	0.436	0.564	1																	
USDHKD	0.049	0.085	0.269	0.194	0.116	0.182	1																
USDHUF	0.086	0.496	0.852	0.456	0.569	0.886	0.188	1															
USDINR	0.141	0.490	0.439	0.428	0.428	0.418	0.147	0.479	1														
USDIDR	0.059	0.499	0.276	0.334	0.587	0.398	0.056	0.398	0.525	1													
USDMYR	0.129	0.604	0.507	0.481	0.610	0.519	0.143	0.517	0.509	0.537	1												
USDMXN	0.164	0.602	0.497	0.482	0.633	0.573	0.027	0.571	0.573	0.531	0.552	1											
USDPEN	0.187	0.391	0.324	0.410	0.532	0.350	0.202	0.332	0.280	0.327	0.476	0.373	1										
USDPHP	0.222	0.451	0.419	0.354	0.336	0.390	0.314	0.427	0.591	0.357	0.523	0.395	0.347	1									
USDPLN	0.059	0.520	0.878	0.470	0.592	0.903	0.268	0.902	0.529	0.404	0.575	0.628	0.420	0.482	1								
USDRON	0.008	0.438	0.945	0.395	0.486	0.902	0.279	0.863	0.427	0.287	0.490	0.495	0.308	0.398	0.882	1							
USORUB	0.188	0.513	0.513	0.472	0.675	0.564	0.085	0.578	0.371	0.436	0.557	0.579	0.402	0.244	0.585	0.522	1						
USDOSD	0.097	0.647	0.718	0.605	0.699	0.729	0.248	0.743	0.550	0.546	0.808	0.626	0.517	0.568	0.793	0.711	0.646	1					
USDZAR	0.247	0.654	0.478	0.646	0.625	0.531	0.169	0.563	0.514	0.546	0.551	0.615	0.398	0.376	0.584	0.492	0.541	0.681	1				
USDKRW	0.111	0.521	0.606	0.417	0.596	0.602	0.293	0.611	0.476	0.432	0.623	0.499	0.511	0.543	0.686	0.632	0.491	0.800	0.556	1			
USDTHB	0.023	0.489	0.530	0.452	0.583	0.530	0.251	0.554	0.487	0.415	0.679	0.491	0.460	0.472	0.621	0.546	0.526	0.762	0.556	0.796	1		
USDTRY	0.379	0.488	0.374	0.347	0.403	0.374	0.179	0.422	0.422	0.387	0.440	0.377	0.189	0.369	0.422	0.369	0.376	0.442	0.484	0.317	0.330	0.331	1

Figure 2. Explanatory Factor Analysis (EFA) (January 2009 - August 2021)



Furthermore, regarding explanatory factor analysis, Figure 2. showed variables grouped together. It describes projections of variables from p-dimensional space to k-dimensional space ($k < p$) to maintain minimum amount of data explaining the observations. The Figure 2. illustrates correlations between initial variables and components in terms of vectors. There are some variables that could explain most of the

information regarding emerging economies currencies. As seen in the Figure 2. Factor 1 and Factor 2 together can explain (59,33%) the emerging markets' currencies movement affected by global factors. Most of these currencies did show correlations around 1, considered a high positive correlation. Singapore Dollar, Polish Zloty, Hungarian Forint and Czech Koruna were the most correlated currencies to Factor 1. Romanian Leu was the most correlated currency to Factor 2, but correlation was lower than 0,70 (0,54).

Moreover, Singapore Dollar, Polish Zloty and Hungarian Forint were the most contributed currencies to Factor 1. Currencies contributed almost equally in Factor 1. Hong Kong Dollar, Philippine Peso and Argentina Peso were the most contributed currencies to Factor 2. Total contribution of these three currencies were almost 40% of Factor 2.

Part 1.1 Empirical Tests in the High Liquidity Market Regime (January 2009 – June 2013)

Figure 3. Eigenvalues of EM Currencies (January 2009 - June 2013) by PCA

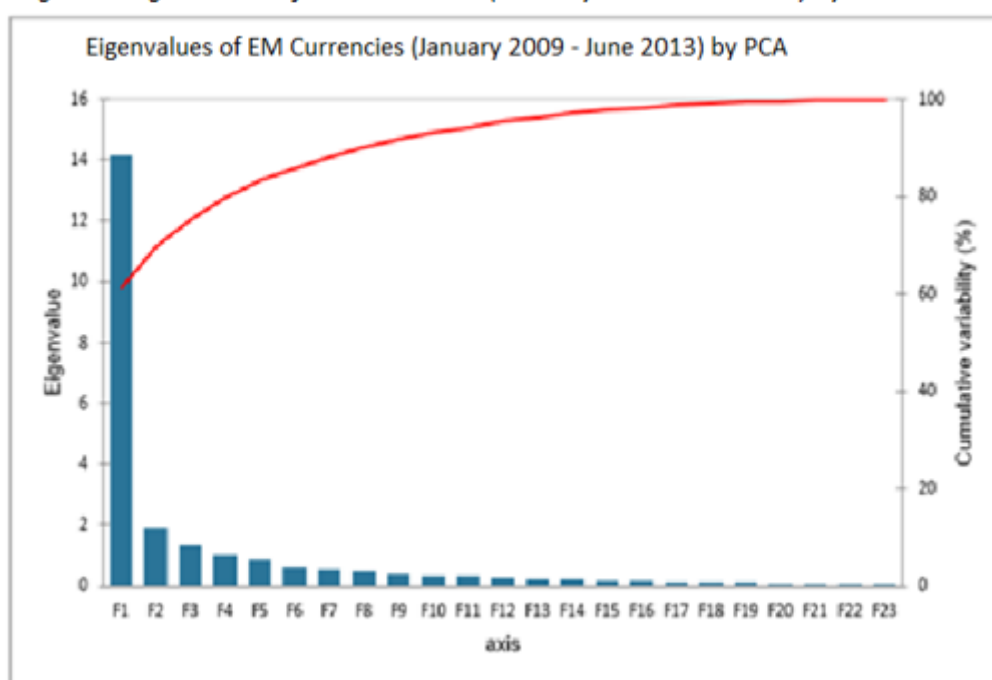


Figure 3. shows the findings of the eigenvalues of the current prices for the emerging markets between the years January 2009 – June 2013. All of the currencies examined in the study are labeled as F1 through F23. All of the eigenvalues for the currencies were found higher than zero or positive, which was acceptable. The eigenvalues which are higher than 1 are considered as subscales of the data set. Three eigenvalues were found to be higher than the value of 1 so the data set had three subscales. On the other hand, some of the variables (F8-F23) had eigenvalues close to 0 that means these items show multicollinearity because all of the variances could be explained with the first 7 variables. Table 6. shows that PCA analysis (factor loading). According to the data in the Table 6., F1 had maximum variability with the Singapore Dollar, Polish Zloty and South Korean Won.

Table 6. Factor Loadings from PCA (January 2009 - June 2013)

	F1	F2	F3
USDARS	0,072	-0,539	0,114
USDBRL	0,793	-0,220	-0,191
USDBGN	0,841	0,438	-0,028
USDCLP	0,663	-0,179	-0,495
USDCOP	0,787	-0,132	0,353
USDCZK	0,852	0,418	0,126
USDHKD	0,469	0,364	-0,390
USDHUF	0,860	0,359	0,128
USDINR	0,767	-0,284	-0,311
USDIDR	0,722	-0,367	0,257
USDMYR	0,874	-0,204	-0,040
USDMXN	0,867	-0,021	-0,083
USDPEN	0,556	-0,368	0,497
USDPHP	0,765	-0,238	-0,303
USDPLN	0,917	0,268	0,102
USDRON	0,837	0,441	0,068
USDRUB	0,843	0,168	0,174
USDSGD	0,938	-0,055	0,035
USDZAR	0,802	-0,122	-0,049
USDKRW	0,880	-0,038	0,222
USDTWD	0,815	-0,136	0,172
USDTHB	0,739	-0,294	-0,301
USDTRY	0,867	0,059	-0,123

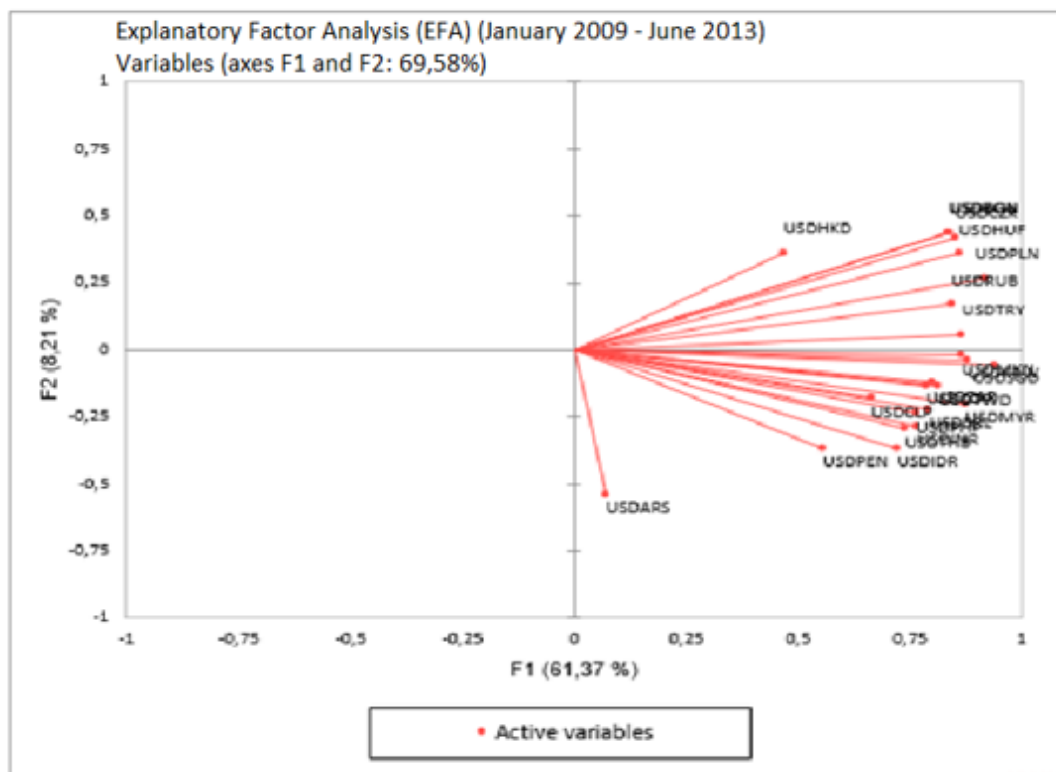
Table 6. summarizes factor loading from the principal factor analysis and principal components analysis for the first time period. According to the results, most of the currencies (N=19) belonged to factor 1. Other factors had none.

Table 7. shows the results of the correlation coefficients of the emerging markets' currencies conducted. Bulgarian Lev and, Hungarian Forint, Czech Koruna and Malaysian Ringgit have the greatest number of high positive correlations ($r < +0,70$) with other emerging markets' currencies.

Table 7. Correlation Coefficients of the EM Currencies (January 2009 - June 2013)

Variables	USDARS	USDBRL	USDGN	USDCPL	USDCOP	USDCZK	USDHKD	USDHUF	USDINR	USDIDR	USDMYR	USDMXN	USDPEN	USDPHP	USDPLN	USDRON	USD RUB	USD SGD	USDZAR	USD KRW	USD TWD	USD THB	USD TRY
USDARS	1																						
USDBRL	0.090	1																					
USDGN	-0.067	0.601	1																				
USDCPL	0.019	0.705		1																			
USDCOP	0.145	0.644	0.579		1																		
USDCZK	-0.100	0.575	0.938	0.462	0.658	1																	
USDHKD	-0.077	0.291	0.517	0.330	0.228	0.440	1																
USDHUF	0.018	0.561	0.881	0.446	0.681	0.904	0.449	1															
USDINR	0.208	0.707	0.584	0.621	0.542	0.508	0.274	0.540	1														
USDIDR	0.244	0.605	0.432	0.348	0.708	0.483	0.228	0.536	0.601	1													
USDMYR	0.130	0.709	0.611	0.649	0.688	0.640	0.331	0.653	0.713	0.650	1												
USDMXN	-0.052	0.690	0.701	0.623	0.590	0.696	0.311	0.700	0.741	0.577	0.740	1											
USDPEN	0.126	0.397	0.283	0.277	0.617	0.391	0.021	0.338	0.303	0.600	0.486	0.469	1										
USDPHP	0.187	0.627	0.563	0.581	0.497	0.513	0.472	0.535	0.727	0.569	0.697	0.654	0.404	1									
USDPLN	0.014	0.634	0.886	0.527	0.719	0.918	0.468	0.915	0.617	0.565	0.739	0.804	0.449	0.597	1								
USD RON	-0.070	0.559	0.944	0.430	0.599	0.929	0.469	0.884	0.525	0.460	0.614	0.684	0.310	0.521	0.889	1							
USD RUB	0.004	0.592	0.757	0.474	0.660	0.781	0.274	0.830	0.561	0.522	0.751	0.753	0.467	0.516	0.824	0.787	1						
USD SGD	0.116	0.739	0.746	0.670	0.745	0.764	0.404	0.798	0.652	0.635	0.897	0.796	0.548	0.717	0.843	0.738	0.819	1					
USDZAR	0.050	0.699	0.577	0.669	0.638	0.622	0.371	0.628	0.579	0.614	0.685	0.693	0.502	0.534	0.686	0.603	0.631	0.742	1				
USD KRW	0.002	0.647	0.687	0.414	0.695	0.715	0.408	0.712	0.584	0.757	0.775	0.753	0.630	0.690	0.801	0.714	0.720	0.839	0.655	1			
USD TWD	0.117	0.623	0.605	0.468	0.666	0.631	0.278	0.640	0.587	0.610	0.784	0.712	0.516	0.600	0.705	0.617	0.631	0.818	0.662	0.847	1		
USD THB	0.085	0.645	0.510	0.628	0.504	0.501	0.253	0.486	0.738	0.540	0.683	0.679	0.412	0.734	0.547	0.509	0.549	0.675	0.620	0.581	0.541	1	
USD TRY	0.029	0.653	0.707	0.528	0.691	0.695	0.605	0.763	0.682	0.626	0.723	0.731	0.409	0.716	0.792	0.708	0.688	0.770	0.663	0.745	0.636	0.656	1

Figure 4. Explanatory Factor Analysis (EFA) (January 2009 - June 2013)



As seen in the Figure 4. Factor 1 and Factor 2 together can explain (69,58%) the emerging markets' currencies movement affected by global factors. Most of these currencies did show correlations around 1, considered a high positive correlation. Singapore Dollar, Polish Zloty and South Korean Won were the most correlated currencies to Factor 1. Romanian Leu was the most correlated currency to Factor 2, but correlation was lower than 0,70 (0,44).

Moreover, Singapore Dollar, Polish Zloty, South Korean Won and Turkish Lira were the most contributed currencies to Factor 1. Currencies contributed almost equally in Factor 1.

Hong Kong Dollar, Philippine Peso and Argentina Peso, Bulgarian Lev and Romanian Leu were the most contributed currencies to Factor 2. Total contribution of these three currencies were almost 36% of Factor 2. Peruvian Sol, Chilean Peso and Hong Kong Dollar were contributed to Factor 3 by almost 48%.

Part 1.2 Empirical Tests in Monetary Tightening Market Regime (July 2013 – December 2019)

Figure 5. Eigenvalues of EM Currencies (July 2013 - December 2019) by PCA

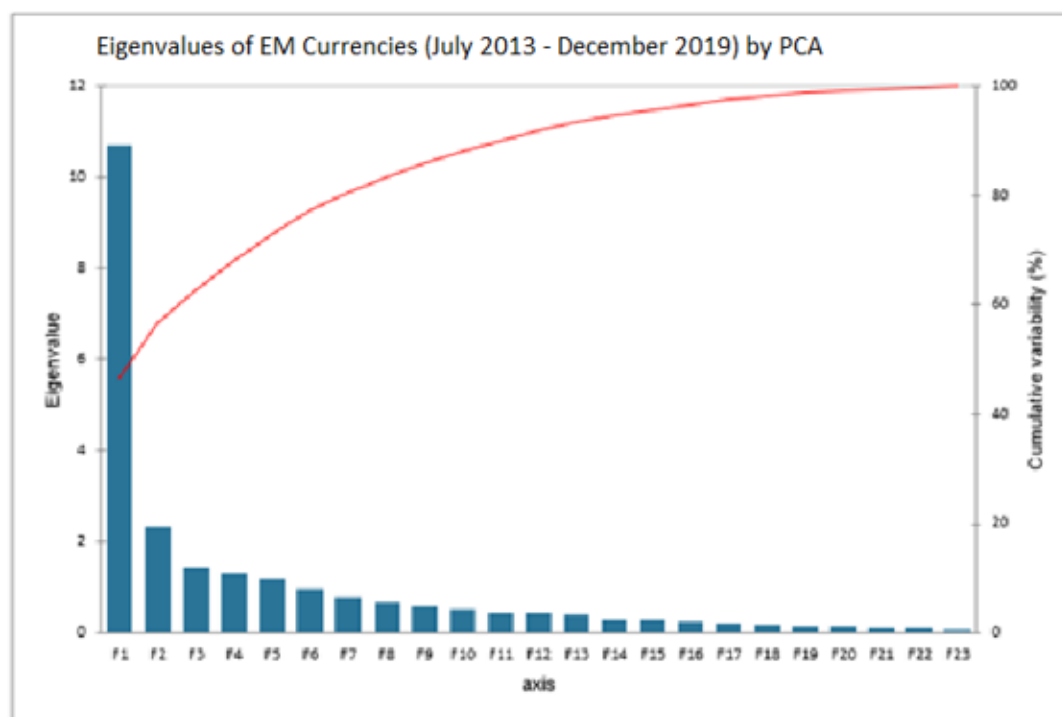


Figure 5. shows the findings of the eigenvalues of the current prices for the emerging markets between the years July 2013 – December 2019. All of the currencies examined in the study are labeled as F1 through F23. All of the eigenvalues for the currencies were found higher than zero or positive, which was acceptable. The eigenvalues which are higher than 1 are considered as subscales of the data set. Five eigenvalues were found to be higher than the value of 1 so the data set had five subscales

On the other hand, some of the variables (F11-F23) had eigenvalues close to 0 that means these items show multicollinearity because all of the variances could be explained with the first 10 variables.

Table 8. shows that PCA analysis (factor loading). According to the data in the Table 8., F1 had maximum variability with the Singapore Dollar, Polish Zloty, Hungarian Forint and Colombian Peso.

Table 8. Factor Loadings from PCA (July 2013 - December 2019)

	F1	F2	F3	F4	F5
USDARS	0,274	-0,416	0,555	-0,416	0,005
USDBRL	0,711	-0,268	0,098	-0,021	-0,151
USDBGN	0,768	0,571	0,172	0,047	0,014
USDCLP	0,668	-0,103	-0,100	-0,319	-0,116
USDCOP	0,819	-0,069	-0,250	-0,183	-0,089
USDCZK	0,764	0,534	0,195	0,052	0,006
USDHKD	0,303	-0,191	-0,241	-0,298	0,669
USDHUF	0,809	0,386	0,258	0,040	-0,023
USDINR	0,521	-0,393	0,196	0,321	0,284
USDIDR	0,571	-0,367	-0,067	0,468	-0,101
USDMYR	0,742	-0,169	-0,141	0,212	-0,213
USDMXN	0,685	-0,112	0,040	0,078	-0,020
USDPEN	0,712	-0,033	-0,094	-0,215	0,191
USDPHP	0,438	-0,348	0,249	0,263	0,491
USDPLN	0,836	0,402	0,151	0,031	0,173
USDRON	0,764	0,557	0,168	0,028	0,077
USDRUB	0,613	-0,042	-0,146	-0,431	-0,266
USDSGD	0,911	0,013	-0,195	0,067	-0,079
USDZAR	0,726	-0,311	0,069	-0,134	-0,136
USDKRW	0,738	-0,045	-0,299	-0,075	0,166
USDTWD	0,776	-0,139	-0,324	-0,083	0,023
USDTHB	0,669	-0,131	-0,270	0,391	-0,189
USDTRY	0,403	-0,427	0,545	-0,054	-0,241

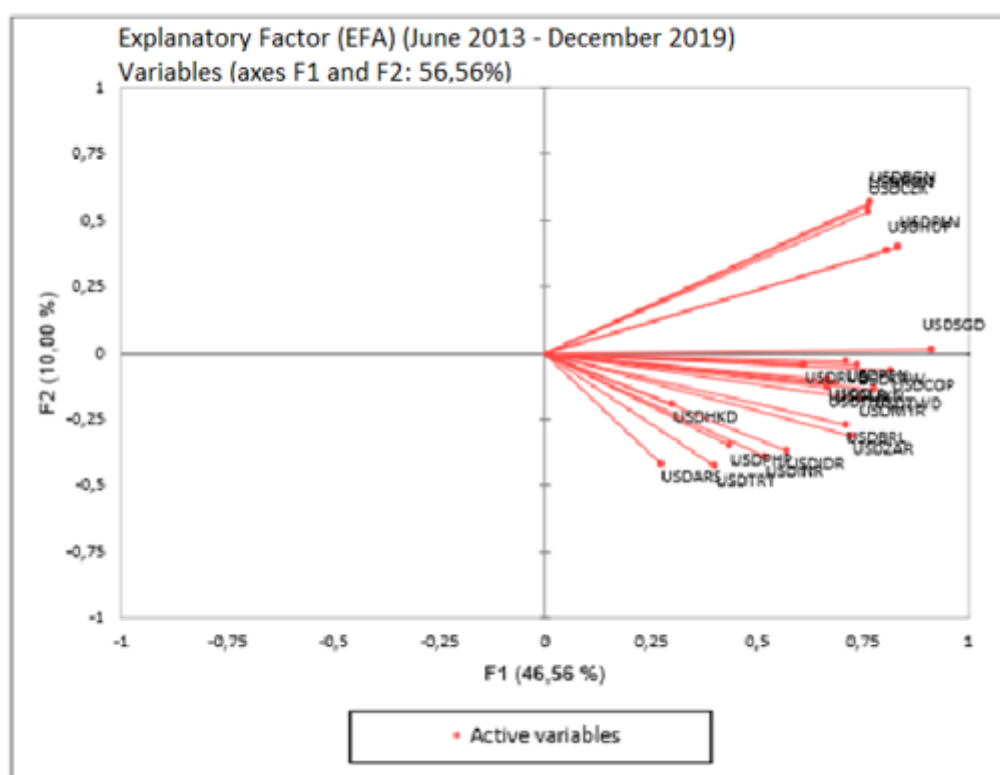
Table 8. summarizes factor loading from the principal factor analysis and principal components analysis for the first time period. According to the results, most of the currencies (N=13) belonged to factor 1. Other factors had none.

Table 9. shows the results of the correlation coefficients of the emerging markets' currencies conducted for the second time period. Bulgarian Lev and Czech Koruna have the greatest number of high positive correlations ($r < +0,70$) with other emerging markets' currencies.

Table 9. Correlation Coefficients of the EM Currencies (July 2013 - December 2019)

Variables	USDARS	USDBRL	USDCLP	USDCOP	USDCZK	USDHKD	USDHUF	USDIDR	USDILS	USDINR	USDJPY	USDKRW	USDTRY	USDMXN	USDPEN	USDPHP	USDPLN	USDRON	USDRUB	USDSEK	USDTHB	USDTRY	USDTRY
USDARS	1																						
USDBRL	0.353	1																					
USDCLP	0.816	0.447	1																				
USDCOP	0.384	0.439	0.401	1																			
USDCZK	0.152	0.628	0.552	0.631	1																		
USDHKD	0.023	0.431	0.303	0.429	0.512	1																	
USDHUF	0.068	0.176	0.111	0.287	0.300	0.304	1																
USDIDR	0.203	0.455	0.842	0.535	0.564	0.854	0.085	1															
USDILS	0.234	0.130	0.219	0.293	0.333	0.255	0.264	0.345	1														
USDINR	0.042	0.462	0.256	0.378	0.440	0.234	0.188	0.332	0.548	1													
USDJPY	0.136	0.584	0.455	0.393	0.593	0.430	0.070	0.486	0.348	0.535	1												
USDKRW	0.246	0.455	0.425	0.384	0.580	0.441	0.135	0.516	0.453	0.377	0.521	1											
USDTRY	0.247	0.487	0.485	0.528	0.615	0.497	0.517	0.493	0.395	0.312	0.517	0.557	1										
USDPEN	0.302	0.405	0.157	0.149	0.201	0.214	0.265	0.271	0.474	0.326	0.396	0.313	0.311	1									
USDPHP	0.327	0.439	0.877	0.474	0.579	0.809	0.241	0.876	0.384	0.325	0.486	0.352	0.379	0.338	1								
USDPLN	0.039	0.403	0.504	0.397	0.541	0.832	0.171	0.846	0.252	0.240	0.438	0.436	0.473	0.194	0.380	1							
USDRON	0.236	0.420	0.403	0.490	0.631	0.396	0.164	0.411	0.194	0.240	0.478	0.405	0.472	0.097	0.433	0.388	1						
USDSEK	0.138	0.640	0.679	0.572	0.747	0.642	0.348	0.667	0.377	0.557	0.782	0.561	0.606	0.353	0.723	0.683	0.565	1					
USDTHB	0.369	0.574	0.393	0.646	0.565	0.386	0.390	0.530	0.434	0.541	0.489	0.462	0.486	0.248	0.485	0.404	0.442	0.634	1				
USDTRY	0.200	0.495	0.498	0.489	0.467	0.445	0.124	0.492	0.348	0.292	0.535	0.397	0.500	0.347	0.558	0.502	0.395	0.754	0.490	1			
USDTRY	0.593	0.504	0.428	0.489	0.486	0.448	0.294	0.488	0.402	0.367	0.640	0.525	0.529	0.316	0.577	0.460	0.559	0.785	0.536	0.781	1		
USDTRY	0.593	0.504	0.428	0.489	0.486	0.448	0.294	0.488	0.402	0.367	0.640	0.525	0.529	0.316	0.577	0.460	0.559	0.785	0.536	0.781	0.536	1	
USDTRY	0.447	0.445	0.196	0.310	0.282	0.271	0.095	0.267	0.317	0.348	0.335	0.723	0.329	0.281	0.205	0.189	0.252	0.296	0.478	0.348	0.221	0.177	1

Figure 6. Explanatory Factor Analysis (EFA) (July 2013 - December 2019)



As seen in the Figure 6. Factor 1 and Factor 2 together can explain (56,56%) the emerging markets' currencies' movement affected by global factors. Most of these currencies did show correlations around 1, considered a high positive correlation. Singapore Dollar, Polish Zloty and Colombian Peso were the most correlated currencies to Factor 1. Romanian Leu was the most correlated currency to Factor 2, but correlation

was lower than 0,70 (0,55). Turkish Lira was the most correlated currency to Factor 3, but correlation was lower than 0,70 (0,54).

Moreover, Singapore Dollar, Polish Zloty, Colombian Peso and Hungarian Forint were the most contributed currencies to Factor 1. Currencies contributed almost equally in Factor 1.

Bulgarian Lev, Czech Koruna and Romanian Leu were the most contributed currencies to Factor 2. Total contribution of these three currencies were 40% of Factor 2. Argentina Peso and Turkish Lira were contributed to Factor 3 by almost 43%.



Part 1.3 Empirical Tests in Pandemic (January 2020 – August 2021)

Figure 7. Eigenvalues of EM Currencies (January 2020 - August 2021) by PCA

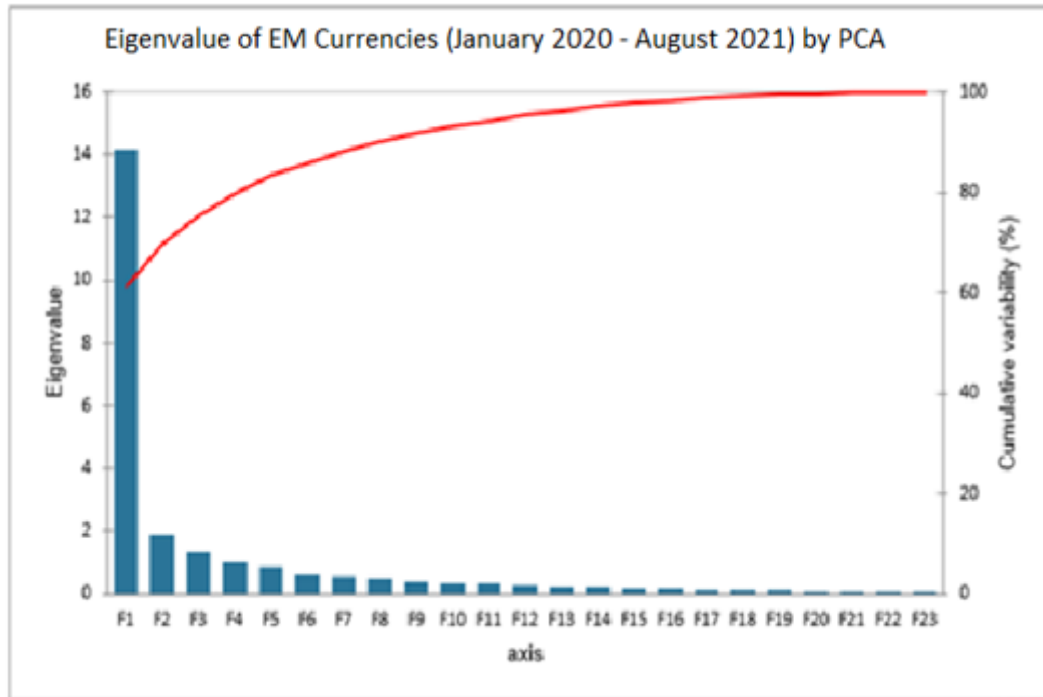


Figure 7. shows the findings of the eigenvalues of the current prices for the emerging markets between the years January 2020 – August 2021. All of the currencies examined in the study are labeled as F1 through F23. All of the eigenvalues for the currencies were found higher than zero or positive, which was acceptable. The eigenvalues which are higher than 1 are considered as subscales of the data set. Five eigenvalues were found to be higher than the value of 1 so the data set had five subscales

On the other hand, some of the variables (F10-F23) had eigenvalues close to 0 that means these items show multicollinearity because all of the variances could be explained with the first 9 variables.

Table 10. shows that PCA analysis (factor loading). According to the data in the Table 10., F1 had maximum variability with the Singapore Dollar, Czech Koruna, Hungarian Forint and Polish Zloty.

Table 10. Factor Loadings from PCA (January 2020 - August 2021)

	F1	F2	F3	F4	F5
USDARS	-0,116	-0,509	0,459	-0,418	-0,341
USDBRL	0,745	-0,386	0,028	0,197	-0,071
USDBGN	0,705	0,500	0,426	0,168	-0,116
USDCLP	0,643	0,116	-0,223	0,557	-0,028
USDCOP	0,845	-0,416	-0,173	0,076	0,147
USDCZK	0,906	0,008	0,325	0,033	-0,050
USDHKD	-0,282	0,601	0,372	-0,291	0,173
USDHUF	0,857	0,058	0,243	0,198	-0,036
USDINR	0,682	-0,300	-0,109	-0,292	-0,217
USDIDR	0,677	-0,384	-0,206	-0,396	0,249
USDMYR	0,738	0,239	-0,101	-0,418	0,139
USDMXN	0,692	-0,606	-0,024	0,070	-0,085
USDPEN	0,191	0,541	-0,351	0,188	0,444
USDPHP	0,455	0,642	-0,175	-0,079	-0,341
USDPLN	0,856	0,160	0,405	0,067	0,030
USDRON	0,712	0,469	0,447	0,116	-0,114
USDRUB	0,722	-0,549	-0,105	-0,065	0,265
USDSGD	0,912	0,248	-0,100	-0,200	-0,056
USDZAR	0,820	-0,308	-0,179	0,120	-0,246
USDKRW	0,482	0,477	-0,497	-0,127	-0,225
USDTWD	0,454	0,538	-0,214	-0,354	-0,009
USDTHB	0,773	0,108	-0,291	-0,056	0,149
USDTRY	0,495	-0,057	0,574	-0,070	0,472

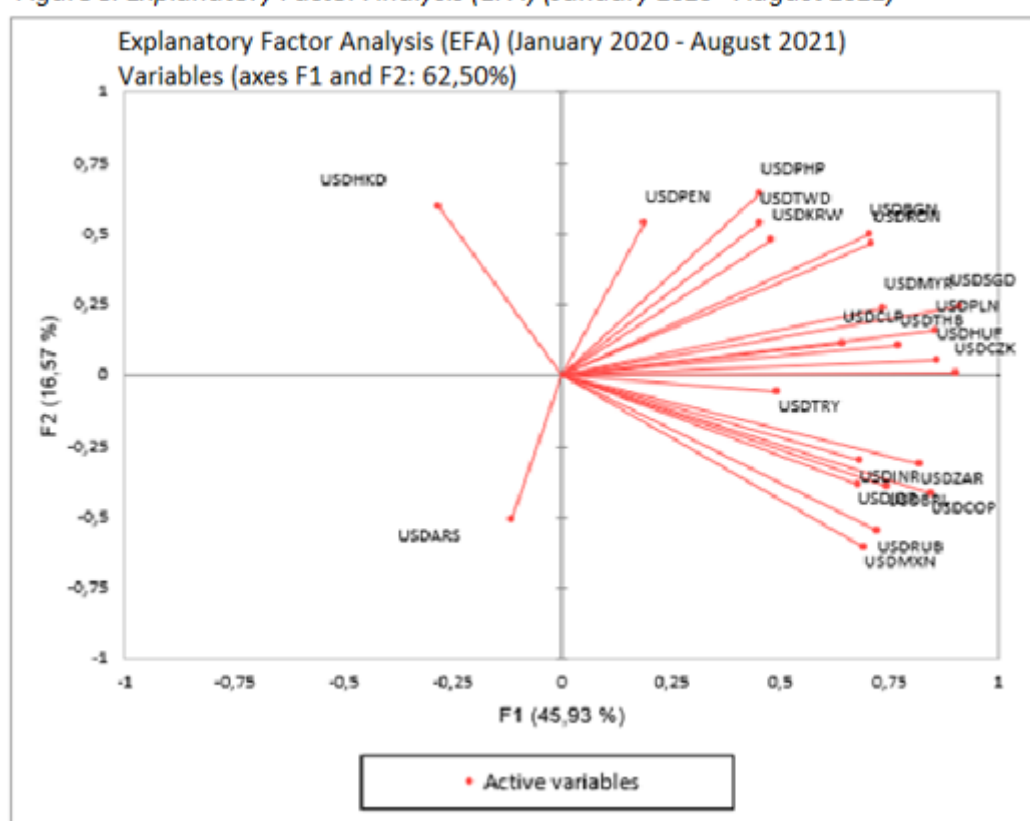
Table 10. summarizes factor loading from the principal factor analysis and principal components analysis for the first time period. According to the results, most of the currencies (N=12) belonged to factor 1. Other factors had none.

Table 11. shows the results of the correlation coefficients of the emerging markets' currencies conducted for the second time period. Bulgarian Lev has the greatest number of high positive correlations ($r < +0,70$) with other emerging markets' currencies.

Table 11. Correlation Coefficients of the EM Currencies (January 2020 - August 2021)

Variables	USDARS	USDBRL	USDGBP	USDCJP	USDCOP	USDCZK	USDHKD	USDHUF	USDINR	USDIDR	USDMYR	USDMXN	USDPEN	USDPHP	USDPLN	USDRON	USD RUB	USD SGD	USDZAR	USDTRY	USD TWD	USD THB	USDTRY
USDARS	1																						
USDBRL	0.215	1																					
USDGBP	-0.182	0.338	1																				
USDCJP	-0.367	0.564	0.524	1																			
USDCOP	-0.031	0.797	0.307	0.575	1																		
USDCZK	-0.008	0.659	0.788	0.485	0.686	1																	
USDHKD	0.045	-0.431	0.144	-0.268	-0.504	-0.181	1																
USDHUF	-0.055	0.644	0.725	0.575	0.657	0.885	-0.199	1															
USDINR	0.139	0.446	0.257	0.265	0.683	0.576	-0.405	0.559	1														
USDIDR	0.065	0.464	0.107	0.226	0.760	0.575	-0.354	0.476	0.667	1													
USDMYR	-0.068	0.457	0.507	0.340	0.536	0.605	0.060	0.450	0.499	0.551	1												
USD MXN	0.217	0.706	0.206	0.448	0.835	0.622	-0.486	0.536	0.611	0.686	0.384	1											
USD PEN	-0.519	0.017	0.200	0.365	0.091	0.050	0.264	0.232	-0.057	0.020	0.345	-0.155	1										
USD PHP	-0.364	0.042	0.558	0.267	0.135	0.414	0.177	0.492	0.395	0.075	0.487	-0.056	0.399	1									
USD PLN	-0.051	0.567	0.865	0.423	0.578	0.813	-0.062	0.805	0.450	0.437	0.575	0.482	0.558	0.460	1								
USD RON	-0.141	0.339	0.992	0.514	0.356	0.805	0.188	0.727	0.283	0.157	0.516	0.232	0.367	0.524	0.857	1							
USD RUB	0.093	0.676	0.168	0.396	0.678	0.609	-0.477	0.530	0.610	0.404	0.417	0.795	-0.013	-0.100	0.513	0.199	1						
USD SGD	-0.199	0.534	0.699	0.553	0.661	0.796	-0.086	0.705	0.649	0.594	0.845	0.451	0.249	0.620	0.746	0.707	0.537	1					
USDZAR	0.002	0.808	0.397	0.597	0.823	0.442	-0.485	0.618	0.645	0.533	0.443	0.812	-0.080	0.242	0.540	0.397	0.708	0.688	1				
USDTRY	-0.362	0.268	0.383	0.452	0.253	0.280	0.005	0.230	0.344	0.212	0.583	0.082	0.309	0.545	0.223	0.382	0.085	0.665	0.418	1			
USD TWD	-0.220	0.087	0.461	0.280	0.306	0.277	0.111	0.340	0.216	0.277	0.545	-0.082	0.314	0.456	0.342	0.462	0.097	0.586	0.227	0.666	1		
USD THB	-0.362	0.457	0.447	0.406	0.684	0.570	-0.325	0.576	0.443	0.556	0.599	0.400	0.233	0.483	0.616	0.436	0.541	0.740	0.657	0.552	0.493	1	
USDTRY	0.041	0.399	0.500	0.139	0.456	0.565	0.061	0.465	0.198	0.287	0.414	0.251	-0.099	-0.133	0.596	0.553	0.395	0.792	0.261	-0.097	0.161	0.357	1

Figure 8. Explanatory Factor Analysis (EFA) (January 2020 - August 2021)



As seen in the Figure 8. Factor 1 and Factor 2 together can explain (62,50%) the emerging markets' currencies movement affected by global factors. Most of these currencies did show correlations around 1, considered a high positive correlation. Singapore Dollar, Polish Zloty and Hungarian Forint were the most correlated currencies to Factor 1. Philippine Peso was the most correlated currency to Factor 2, but correlation

was lower than 0,70 (0,62). Turkish Lira was the most correlated currency to Factor 3, but correlation was lower than 0,70 (0,57).

Moreover, Singapore Dollar and Polish Zloty were the most contributed currencies to Factor 1. Currencies contributed almost equally in Factor 1.

Philippine Peso, Mexican Peso and Hong Kong Dollar were the most contributed currencies to Factor 2. Total contribution of these three currencies were almost 30% of Factor 2.

South Korean Won, Argentina Peso and Turkish Lira were contributed to Factor 3 by almost 37%.

Part 2

In this part, three regression analysis are applied to the periods these are high liquidity market regime (January 2009 – June 2013), Monetary Tightening Market Regime (July 2013 – December 2019) and Pandemic (January 2020 – August 2021) in order to measure the effect of global factors on emerging markets currencies’.

Global liquidity has an incontrovertible impact on emerging markets from their monetary policy for funding decision. So that, it is appropriate to have the basic funding indicators which are monitored by all countries.

In line with this, developed market government bonds with different tenors and some important Bloomberg financial conditions indices are collected. Besides MSCI Index, a free-float weighted equity index, Bloomberg Commodity Index, Bloomberg Industrial Metals Subindex, Volatility Index were chosen. Moreover, BNP Paribas Global Risk Premium Index which measures the time varying risk premium and JPM US Money Market Trend Index are thought to be useful.

When analyzed PCA on 23 emerging markets’ currencies for three period, it is found that three factors for the first period and five factors for the second and third periods had eigenvalues more than 1. These factors are then regressed with the global factors data set.

Global factors data set has 151 observations, and the summary statistics are shown as below. This descriptive analysis consists of minimum, maximum, mean scores of the findings as well as standard deviations for the data. The data showed variations in the emerging market currencies and economic indicators between 2009 and 2021.

Table 12. Summary Statistics of Global Data from PCA

Variable	Observations	Minimum	Maximum	Mean	Std. deviation
USGG2YR Index	151	-0,668	0,472	-0,005	0,138
USGG10YR Index	151	-0,573	0,639	-0,010	0,219
BCOM Index	151	-0,147	0,130	0,000	0,042
AIJPTMMU Index	151	-0,003	0,010	0,000	0,002
EUBS5 Curncy	151	-21,500	19,000	0,278	5,784
EURUSD Curncy	151	-0,074	0,075	0,000	0,026
VIX Index	151	-19,390	21,270	-0,188	5,260
DXY Curncy	151	-0,062	0,060	0,001	0,021
BCOMIN Index	151	-0,201	0,153	0,005	0,057
USGGBE05 Index	151	-0,842	0,566	0,016	0,182
GTDEM5Y Govt	151	-0,558	0,548	-0,021	0,165
BFCIUS Index	151	-8,527	21,000	0,062	3,027
BFCIEU Index	151	-38,714	53,200	0,159	7,273
US0003M Index	151	-0,894	0,295	-0,007	0,109
USGG3M Index	151	-1,206	0,197	-0,001	0,119
BNPSGRP Index	151	-1,610	1,470	-0,003	0,595
FWISEU55 Index	151	-0,298	0,272	-0,006	0,094
MXWO Index	151	-0,135	0,127	0,010	0,043
MXEU0FN Index	151	-0,246	0,311	0,005	0,078
EUBS1 BGN Curncy	151	-30,600	36,000	0,302	7,355
EUBS10 Curncy	151	-15,430	16,250	0,106	4,873
USGGBE02 Index	151	-1,880	1,201	0,033	0,357
USGGBE10 Index	151	-0,503	0,367	0,008	0,147
GTDEM1Y Govt	151	-0,481	0,360	-0,012	0,102
GTDEM10Y Govt	151	-0,553	0,411	-0,024	0,178
US0006M Index	151	-0,416	0,258	-0,010	0,097
USGG6M Index	151	-1,013	0,199	-0,002	0,112

Figure 9. Explanatory Factor Analysis (EFA) of Global Data (January 2009 - August 2021)

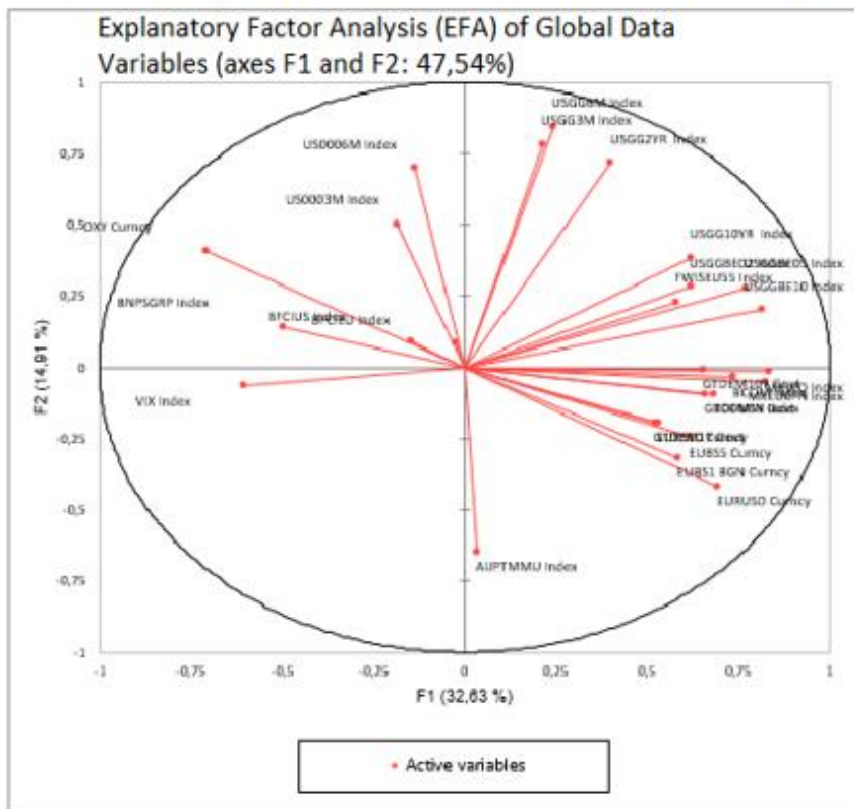


Figure 10. KMO and Bartlett's Test Results

Data	Adequacy
USGG2YR Index	0,771
USGG10YR Index	0,802
BCOM Index	0,871
AIJPTMMU Index	0,821
EUBS5 Curncy	0,725
EURUSD Curncy	0,786
VIX Index	0,827
DXY Curncy	0,790
BCOMIN Index	0,905
USGGBE05 Index	0,792
GTDEM5Y Govt	0,731
BFCIUS Index	0,566
BFCIEU Index	0,422
US0003M Index	0,594
USGG3M Index	0,681
BNPSGRP Index	0,889
FWISEU55 Index	0,876
MXWO Index	0,837
MXEU0FN Index	0,889
EUBS1 BGN Curncy	0,829
EUBS10 Curncy	0,716
USGGBE02 Index	0,783
USGGBE10 Index	0,855
GTDEM1Y Govt	0,765
GTDEM10Y Govt	0,701
US0006M Index	0,651
USGG6M Index	0,689
KMO	0,786

Figure 10. presents the KMO, and Barlett's Test results based on the study data. According to the findings, the Kaiser-Meyer-Olkin measure of sampling adequacy is higher than the threshold value of 0.00 (0.786), which means that the data set is suitable and adequate.

Figure 11. Eigenvalues of Global Factors (January 2009 - August 2021) by PCA

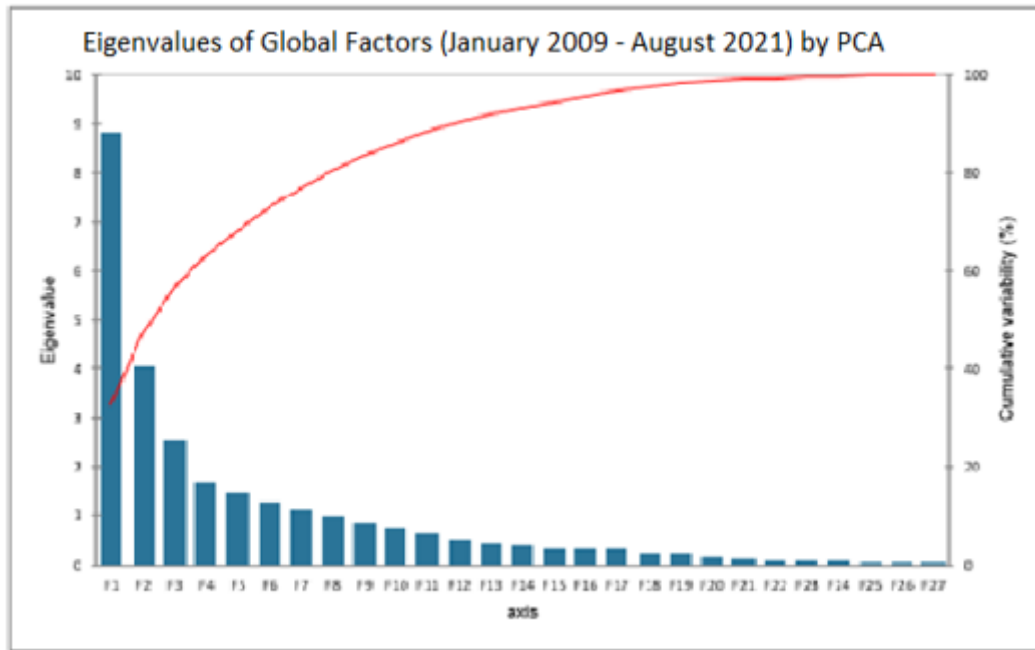


Figure 11. shows the eigenvalues of the global factors data. The eigenvalues which are higher than 1 are considered as subscales of the data set. Seven eigenvalues were found to be higher than the value of 1 so the data set had seven subscales.

There were three factors which have eigenvalues more than 1 for the first time period, five factors for the second and third time periods. These findings were regressed with the global data set individually regarding to the periods.

- Empirical Tests in the High Liquidity Market Regime (January 2009 – June 2013)
- Empirical Tests in Monetary Tightening Market Regime (July 2013 – December 2019)
- Empirical Tests in Pandemic (January 2020 – August 2021)

Part 2.1 Empirical Tests in the High Liquidity Market Regime (January 2009 – June 2013)

The crisis that emerged in the financial sector of the USA in the second half of 2008 spread to the whole world in a very short time and turned into a global financial and real sector crisis. In the first time period, it is seen that their effect on the value of Dollar according to the loose monetary policy environment in United States which FED did made to stabilize the rates between 0.00-0.25 during these time period through 2015.

Besides, in 2010, a revival, albeit limited, was observed in economic activity. Although it is possible to say that the bottom point of the crisis has been overcome, there were still significant risks for many countries. Packages of measures aimed at eliminating the effects of the crisis has been put into practice, but the success in implementing these packages and the response of economies to it have been different in each country.

The money circulating through the world started flowing into emerging markets with a request for a high rate by the investors. The emerging markets which benefited from that environment by utilizing the low funding rates expanded their production capacities. When US Dollar Index falling merged with demand, there were price increasing on commodities. When the three factors formed in the narrowed cluster as a result of the PCA analysis for the relevant 4-year period were regressed with the selected global data, the results were as follows.

Table 13. Regression Results in the High Liquidity Market Regime (January 2009 - June 2013)

Regression Results in the High Liquidity Market Regime (January 2009 - June 2013)						
	F1		F2		F3	
	R Square	P-Value	R Square	P-Value	R Square	P-Value
USGG2YR Index	0,0016	0,7748	0,0009	0,8308	0,0150	0,3823
USGG10YR Index	0,0506	0,1053	0,0071	0,5474	0,0000	0,9667
BCOM Index	0,6254	0,0000	0,0070	0,5517	0,0939	0,0256
AIJPTMMU Index	0,1858	0,0013	0,0105	0,4649	0,0000	0,9654
EUBS5 Curncy	0,4999	0,0000	0,0002	0,9169	0,0002	0,9252
EURUSD Curncy	0,6724	0,0000	0,1384	0,0061	0,0445	0,1295
VIX Index	0,4689	0,0000	0,0013	0,7964	0,0221	0,3820
DXY Curncy	0,7564	0,0000	0,0557	0,0888	0,0258	0,2508
BCOMIN Index	0,5114	0,0000	0,0052	0,6094	0,0220	0,2886
USGGBE05 Index	0,3379	0,0000	0,0199	0,3136	0,0610	0,0746
GTDEM5Y Govt	0,1493	0,0043	0,1079	0,0164	0,0010	0,8204
BFCIUS Index	0,0436	0,1337	0,0265	0,2444	0,0804	0,0397
BFCIEU Index	0,0003	0,9069	0,0224	0,2848	0,0083	0,5156
US0003M Index	0,2356	0,0002	0,0034	0,6770	0,0054	0,6020
USGG3M Index	0,0185	0,3312	0,0196	0,3176	0,0429	0,1369
BNPSGRP Index	0,2188	0,0004	0,0333	0,1912	0,0995	0,0214
FWISEU55 Index	0,1796	0,0016	0,0361	0,1731	0,0059	0,5832
MXWO Index	0,7084	0,0000	0,0030	0,6955	0,0016	0,7778
MXEU0FN Index	0,5782	0,0000	0,0010	0,8219	0,0237	0,2708
EUBS1 BGN Curncy	0,4220	0,0000	0,0360	0,1734	0,0059	0,5851
EUBS10 Curncy	0,3846	0,0000	0,0054	0,6001	0,0000	0,9682
USGGBE02 Index	0,1977	0,0009	0,0031	0,6904	0,0583	0,0815
USGGBE10 Index	0,4435	0,0000	0,0130	0,4154	0,0608	0,0752
GTDEM1Y Govt	0,1750	0,0018	0,0028	0,7076	0,0041	0,6482
GTDEM10Y Govt	0,1629	0,0027	0,0569	0,0854	0,0005	0,8758
US0006M Index	0,2368	0,0002	0,0065	0,5673	0,0074	0,5393
USGG6M Index	0,0438	0,1326	0,0107	0,4621	0,2362	0,0002

Considering the regression analysis, F1 factor is tremendously correlated with US Dollar Index (0,75) and MSCI World Index (0,71).

MSCI World Index captures large and mid-cap representation across developed market countries. The index covers approximately 85% of the free float-adjusted market capitalization in each country. The MSCI Europe Index also captures large and mid-cap representation across developed market countries in Europe.

Bloomberg Commodity Index is calculated on an excess return basis and reflects commodity futures price movements. The index rebalances annually weighted 2/3 by

trading volume and 1/3 by world production and weight-caps are applied at the commodity, sector and group level for diversification. Various commodities are included in this index grouped as energy, metals and agriculture. Natural gas weight is 10.94% of the index, besides gold weight is 10.70% of the index.

Bloomberg Industrial Metals Subindex, formerly known as Dow-Jones-UBS Industrial Metals Subindex is composed of contracts on aluminum, copper, nickel and zinc. Copper weight is 33.62% of this index.

As it is commonly known that world economic growth and copper prices are correlated because this commodity is used in many sectors that can easily show the growth in the world. So that the findings regarding to measuring effects of global data set on the emerging markets' currencies between January 2009 – June 2013 show, both emerging and developed market economics grow together in a liquid market in the world.

As mentioned in the introduction part, emerging market currencies similar to their economic and financial systems have more volatile structure than currencies of developed countries. During the low rate term in United States, many emerging markets took advantage of a loose monetary policy. Despite their finance systems are not strong and their currencies are highly volatile, investors are willing to seek opportunities for financial investments in these times where the global economy rates are low and the emerging markets stay high.

During the time between January 2009 – June 2013, it is seen that F1 factor is thoroughly correlated with US Dollar Index. The U.S. Dollar Index indicates the general international value of the USD. This index does this by averaging the exchange rates between the USD and major world currencies. With the depreciation of the dollar, the appreciation of the euro emerged towards the end of this period. Despite the rapid decline in commodity prices just right after the global financial crisis experienced, the monetary

and fiscal policy responses of both developing and developed economies (fast increases in public investments and rapid reduction in interest rates) caused commodity prices to increase again. Post-crisis gold prices, called as safe “haven”, had increased. Besides, oil prices also stayed high more than 90 USD mostly because of the supply shortages. These information are directly correlated with the results on the regression of this study.

Regardingly, Bloomberg Commodity Index (0,62) and Bloomberg Industrial Metals Subindex (0,51) were two of the most correlated global data with the emerging markets currencies.

Furthermore, during the first time period, it is observed that EURUSD currency and 5 year German Government Bonds were the most correlated data with F2. And, US 3 months Government Bonds was the most correlated with F3. Emerging markets were willing to borrow from the European Region, which is geographically close to them, instead of the United States where the crisis broke out. The government bond yields were relatively higher in Europe than United States. This is comprehensible when the purpose of the establishment of the union and there are countries such as Poland, Czech Republic, Bulgaria, Hungary affiliated to the European Union among emerging markets were considered together.

Part 2.2 Empirical Tests in Monetary Tightening Market Regime (July 2013 – December 2019)

After the global crisis which began first in the USA and spread to Europe and other countries. Markets were normalizing. However, there are other factors affect the global economy during the time period of this study. Chinese economy, which has the leading economy in the emerging markets, were slowing down, the European Union were

struggling with high debt rates and besides migrant crisis. Moreover, there were Brexit process.

After election in United States in 2016, Trump took office at the height of the longest economic expansion in American history with reducing federal taxes and increasing federal spending. During his presidency, Trump totally implemented a false policy on trade with China and began setting trade barriers by aiming to force to make changes on unfair trade practices as he believed. In 2019, emerging markets were relatively volatile and vulnerable. Because the concern about the impact of a US-China trade war were spreading through the emerging markets. Meanwhile, the US presidential elections and Brexit were occupying the global economy agenda. Emerging markets did need to be more careful, and they had to protect themselves from a potential foreign exchange rate fluctuation, credit swap movements, risks in bond yields.

In the second time period, this thesis did investigate the global factors which affect emerging markets' currencies in the monetary tightening world.

The regression results show that, with the monetary tightening clashed with the political issues in the developed countries, the correlation between the emerging markets and the global data barely explain the economic environment in the emerging markets.

The divergence in domestic and foreign demand in developing countries can be seen more clearly in this part of our study. Europe, the most important trade peer of the emerging markets, was trying to deal with both political and financial problems. During these years, Euro rose with the depreciation of the Dollar. While this situation supported the relatively less developed and developing countries among the European Union countries, the European Union started a tightening policy as the high Euro would contribute negatively to Europe's trade over time. Regardingly, Dollar Index (0,66) and EURUSD Currency (0,60) were two of the most correlated global data with the emerging

markets currencies.

Regarding to the regression results, F2 has almost explain the emerging markets currencies' responses to global economic environment just like F1 as the second factor were the most correlated with EURUSD currency and Dollar Index. 2-year US breakeven was the most correlated with F3. That factor could explain mostly time until 2015 during the second time period, where FED decided to change its monetary policy and plunged Dollar liquidity.

Emerging markets countries possibly did choose to borrow long term on Dollar as F4 was the most correlated with 10 years US Government Bond. Besides, it was also correlated with Bloomberg Commodity Index.

Table 14. Regression Results in Monetary Tightening Market Regime (July 2013 – December 2019)

	Regression Results in Monetary Tightening Market Regime (July 2013 – December 2019)									
	F1		F2		F3		F4		F5	
	R Square	P-Value	R Square	P-Value	R Square	P-Value	R Square	P-Value	R Square	P-Value
USGG2YR Index	0,0089	0,4124	0,0001	0,9185	0,0157	0,2748	0,0629	0,0268	0,0006	0,8316
USGG10YR Index	0,0019	0,7050	0,0087	0,4173	0,0048	0,5457	0,2390	0,0000	0,0000	0,9767
BCOM Index	0,2526	0,0000	0,0010	0,7826	0,0467	0,0574	0,1145	0,0024	0,0188	0,2318
AIJPTMMU Index	0,0067	0,4747	0,0000	0,9772	0,0093	0,4022	0,0413	0,0743	0,0004	0,8686
EUBS5 Curncy	0,0323	0,1154	0,0193	0,2249	0,0150	0,2854	0,0010	0,7856	0,0205	0,2114
EURUSD Curncy	0,5965	0,0000	0,3223	0,0000	0,0291	0,1355	0,0022	0,6861	0,0005	0,8532
VIX Index	0,1305	0,0012	0,0293	0,1337	0,0116	0,3485	0,0030	0,6315	0,0128	0,3247
DXY Curncy	0,6571	0,0000	0,2543	0,0000	0,0062	0,4918	0,0017	0,7183	0,0000	0,9667
BCOMIN Index	0,1818	0,0001	0,0006	0,8328	0,0800	0,0121	0,0491	0,0513	0,0187	0,2326
USGGBE05 Index	0,1309	0,0011	0,0144	0,2958	0,0887	0,0081	0,0465	0,0580	0,0026	0,6554
GTDEM5Y Govt	0,1114	0,0028	0,0593	0,0316	0,0303	0,1273	0,0519	0,0448	0,0164	0,2635
BFCIUS Index	0,0002	0,9125	0,0137	0,3071	0,0168	0,2587	0,0203	0,2139	0,0000	0,9822
BFCIEU Index	0,0000	0,9753	0,0168	0,2576	0,0381	0,0866	0,0098	0,3875	0,0153	0,2800
US0003M Index	0,0002	0,9117	0,0000	0,9957	0,0343	0,1046	0,0036	0,6003	0,0151	0,2835
USGG3M Index	0,0504	0,0481	0,0002	0,9150	0,0009	0,7889	0,0052	0,5313	0,0753	0,0151
BNPSGRP Index	0,2810	0,0000	0,0008	0,8101	0,0060	0,4999	0,0110	0,3614	0,0254	0,1636
FWISEU55 Index	0,0377	0,0883	0,0000	0,9759	0,0024	0,6691	0,0881	0,0083	0,0000	0,9964
MXWO Index	0,2920	0,0000	0,0120	0,3403	0,0191	0,2274	0,0008	0,8097	0,0211	0,2044
MXEU0FN Index	0,2132	0,0000	0,0008	0,8115	0,0353	0,0997	0,0119	0,3409	0,0290	0,1360
EUBS1 BGN Curncy	0,0477	0,0548	0,0509	0,0469	0,0309	0,1239	0,0063	0,4905	0,0311	0,1226
EUBS10 Curncy	0,0316	0,1196	0,0049	0,5418	0,0003	0,8747	0,0000	0,9802	0,0086	0,4207
USGGBE02 Index	0,0690	0,0202	0,0121	0,3369	0,1010	0,0046	0,0268	0,1519	0,0316	0,1196
USGGBE10 Index	0,1512	0,0004	0,0078	0,4422	0,0233	0,1822	0,0798	0,0122	0,0006	0,8314
GTDEM1Y Govt	0,0865	0,0090	0,0278	0,1443	0,0177	0,2450	0,0009	0,7903	0,0207	0,2088
GTDEM10Y Govt	0,0688	0,0204	0,0856	0,0093	0,0212	0,2031	0,1099	0,0030	0,0061	0,4970
US0006M Index	0,0113	0,3550	0,0001	0,9296	0,0322	0,1157	0,0004	0,8615	0,0143	0,2965
USGG6M Index	0,0391	0,0826	0,0048	0,5477	0,0058	0,5087	0,0004	0,8611	0,0144	0,2958

Part 2.3 Empirical Tests in Pandemic (January 2020 – August 2021)

Unfortunately, on December 31, 2019, the coronavirus (Covid-19) pandemic did outbreak Wuhan where the first infection case is reported, then this contagious virus was reported by World Health Organization (WHO) after 49 days. First, the virus encouraged social distancing that led to the shutdown of financial markets, businesses. Then the fear and uncertainty did spread to several industries on travel, hospitality, sports, event & entertainment, health, education and many others. By reason of prolonging days of lockdown created a macroeconomic slowdown, global economic outlook changed unexpectedly. Covid-19 had generated significant shock waves on financial markets and the recession had started. Developed markets did publish financial packages which protect liquidity to financial markets, SMEs, public health sector, individuals and essential businesses.

Started as a health crisis, Covid-19 dramatically turned into a financial crisis in a very short period of time. During the months between January 2020 – August 2021, there is a correlation between the global factors and the three factors, which reflects the responses of the emerging markets' currencies together in a narrow cluster, individually. In the third time period, this thesis did investigate the global factors which affect emerging markets' currencies in the pandemic world specifically.

Developed markets were the first that kept pace with this new financial crisis which they encountered. Evaluations on monetary and fiscal policies showed the world started to fight with the pandemic unhesitatingly. On the other hand, some emerging markets were blindsided for a financial crisis hit the global economy. Luckily, the money circulating the world flowed into commodities instead of staying in Dollar. That leads and increase in EURUSD currency with other emerging markets currencies. The

correlation between EURUSD currency and F1 factor revealed this relation.

Not surprisingly, Bloomberg Commodity Index (0,60) and Bloomberg Industrial Metals Subindex (0,60) were the two of the most correlated global factors with the emerging markets currencies. In both crisis, 2008 Global Crisis and 2020 Covid-19 Pandemic Crisis, countries created monetary expansion policies, the liquidity expansion and the decrease in interest rates caused price fluctuations in the commodity markets.

After the problems experienced in the global economy, commodity prices in strategic goods were increased due to the supply-demand structure. To compare the first and the third time periods, it is seen that the effect of monetary policy on commodity prices is significant. Gold and silver prices increase in periods when liquidity increases and interest rates decrease. There is a strong relationship between real interest rates and commodity prices.

The regression results below also show that there is a correlation between the emerging markets currencies and US 2 year and 10 year breakeven. The breakeven inflation rate represents a measure of expected inflation derived from the years that regards. The value implies what market participants expect inflation to be in the next 2 and 10 years, on average.

Inflation data, which is generally at low levels in developed countries, is higher in developing countries due to the demand for imported goods. However, foreign-source dependency, which is a characteristic of developing countries mentioned in the introduction part, maintains the high course of inflation.

The results experienced in trade due to the problems in the supply chain caused by the pandemic also affected developed countries with low inflation. Although inflation expectations remained low in 2020, the expansionary monetary policies made by the central banks of developed countries started to put pressure on prices. While the recent

inflation data has increased the debate on whether inflation will be temporary or permanent, the increase in inflation expectations has caused the central banks of developed countries to gradually leave their expansionary monetary policies.

Regardingly, US 2 year Breakeven (0,54) and US 10 year Breakeven (0,53) were two of the most correlated global data with the emerging markets currencies.

3 months US Government Bonds and 1-year EURUSD Basis were the most correlated global data with F2. US 10 years Government Bonds was the most correlated with F3. While 10 year EURUSD basis one of the most correlated ones with F4 and F5 together, 1 year Germany Government Bonds was also correlated with F5.

Looking at the data, it is possible to say that emerging markets currencies and short-term interest rates are more correlated than long-term rates, and that these rates have a higher explanatory power.

High EURUSD basis data show that there is no dollar shortage, and the market has high liquidity. In the high liquidity environment in the market, the borrowing demands from the emerging markets will cause the world inflation to increase. Indeed, the F1 factor showed this situation by being highly correlated with the US breakeven datas not only on the short term but also on the long term.

In the third time period where pandemic hit the world and led countries to struggle, almost all countries did implement expansionary monetary policies. Having a strong demand on the emerging markets countries for short term borrowing may cause a rush for a recovery in monetary policies among the developed countries. If this does indeed occur, then emerging markets may feasibly have many difficulties on their economies.

Overall, some of the explanatory factors in every single time period were found same in the study these are Bloomberg Commodity Index, Bloomberg Industrial Metals Subindex, EURUSD Currency, Dollar Index, US 5 and 10 years Breakeven, MSCI World

Index, MSCI Europe Index and BNP Paribas Global Risk Premium Index.

Emerging markets play an important role in the world economy and in fact, developed markets cannot be thought without emerging markets. Demand from emerging markets greatly contributes to the growth of the world economy. Even they lack industrial power, their production and consumption are highly important for understanding their funding needs. As hard currency liquidity increases, foreign investors' appetite for emerging markets countries increases. In the study as it is focused on three time periods, the first and the third time periods were financially similar as the world trying to deal with the crisis during this period. Developed markets, Eurozone, and United States, were using their monetary tools to handle the crisis unheeding the inflation and inflation expectations risk.

All these situations above were audibly seen in the regression part of this study.

Table 15. Regression Results in Pandemic (January 2020 – August 2021)

	Regression Results in Pandemic (January 2020 – August 2021)									
	F1		F2		F3		F4		F5	
	R Square	P-Value	R Square	P-Value	R Square	P-Value	R Square	P-Value	R Square	P-Value
USGG2YR Index	0,0089	0,4124	0,0001	0,9185	0,0157	0,2748	0,0629	0,0268	0,0006	0,8316
USGG10YR Index	0,0019	0,7050	0,0087	0,4173	0,0048	0,5457	0,2390	0,0000	0,0000	0,9767
BCOM Index	0,2526	0,0000	0,0010	0,7826	0,0467	0,0574	0,1145	0,0024	0,0188	0,2318
AJPTMMU Index	0,0067	0,4747	0,0000	0,9772	0,0093	0,4022	0,0413	0,0743	0,0004	0,8686
EUBS5 Curncy	0,0323	0,1154	0,0193	0,2249	0,0150	0,2854	0,0010	0,7856	0,0205	0,2114
EURUSD Curncy	0,5965	0,0000	0,3223	0,0000	0,0291	0,1355	0,0022	0,6861	0,0005	0,8532
VIX Index	0,1305	0,0012	0,0293	0,1337	0,0116	0,3485	0,0030	0,6315	0,0128	0,3247
DXY Curncy	0,6571	0,0000	0,2543	0,0000	0,0062	0,4918	0,0017	0,7183	0,0000	0,9667
BCOMIN Index	0,1818	0,0001	0,0006	0,8328	0,0800	0,0121	0,0491	0,0513	0,0187	0,2326
USGGBE05 Index	0,1309	0,0011	0,0144	0,2958	0,0887	0,0081	0,0465	0,0580	0,0026	0,6554
GTDEM5Y Govt	0,1114	0,0028	0,0593	0,0316	0,0303	0,1273	0,0519	0,0448	0,0164	0,2635
BFCIUS Index	0,0002	0,9125	0,0137	0,3071	0,0168	0,2587	0,0203	0,2139	0,0000	0,9822
BFCIEU Index	0,0000	0,9753	0,0168	0,2576	0,0381	0,0866	0,0098	0,3875	0,0153	0,2800
US0003M Index	0,0002	0,9117	0,0000	0,9957	0,0343	0,1046	0,0036	0,6003	0,0151	0,2835
USGG3M Index	0,0504	0,0481	0,0002	0,9150	0,0009	0,7889	0,0052	0,5313	0,0753	0,0151
BNPSGRP Index	0,2810	0,0000	0,0008	0,8101	0,0060	0,4999	0,0110	0,3614	0,0254	0,1636
FWISEU55 Index	0,0377	0,0883	0,0000	0,9759	0,0024	0,6691	0,0881	0,0083	0,0000	0,9964
MXWO Index	0,2920	0,0000	0,0120	0,3403	0,0191	0,2274	0,0008	0,8097	0,0211	0,2044
MXEU0FN Index	0,2132	0,0000	0,0008	0,8115	0,0353	0,0997	0,0119	0,3409	0,0290	0,1360
EUBS1 BGN Curncy	0,0477	0,0548	0,0509	0,0469	0,0309	0,1239	0,0063	0,4905	0,0311	0,1226
EUBS10 Curncy	0,0316	0,1196	0,0049	0,5418	0,0003	0,8747	0,0000	0,9802	0,0086	0,4207
USGGBE02 Index	0,0690	0,0202	0,0121	0,3369	0,1010	0,0046	0,0268	0,1519	0,0316	0,1196
USGGBE10 Index	0,1512	0,0004	0,0078	0,4422	0,0233	0,1822	0,0798	0,0122	0,0006	0,8314
GTDEM1Y Govt	0,0865	0,0090	0,0278	0,1443	0,0177	0,2450	0,0009	0,7903	0,0207	0,2088
GTDEM10Y Govt	0,0688	0,0204	0,0856	0,0093	0,0212	0,2031	0,1099	0,0030	0,0061	0,4970
US0006M Index	0,0113	0,3550	0,0001	0,9296	0,0322	0,1157	0,0004	0,8615	0,0143	0,2965
USGG6M Index	0,0391	0,0826	0,0048	0,5477	0,0058	0,5087	0,0004	0,8611	0,0144	0,2958

PART 3

In the last part of the study, we dive into the Principal Component Analysis (PCA) results. One of the main difficulties in using Principal Component Analysis (PCA) is to select the numbers of principle components. After constructing a new dimensional matrix and choose the best factors that explain the most of the data, others should be entitled as noise to minimize the average loss during the reconstruction.

To make the regression results with global data, which is made on the Part 2, more meaningful, it is highly important to have coherent results by decomposing some currencies among the emerging markets currencies.

After analyzing the reconstruction errors for all periods, results seem comparative with the regression results and PCA analysis by itself.

Part 3.1 Empirical Tests in the High Liquidity Market Regime (January 2009 – June 2013)

Although the financial crisis started in developed countries, it did affect developing countries as of mid-November 2008 in ways that serious depreciation in the stock markets, the currency depreciations, increasing risk premiums in country bonds and commercial bonds and significantly decreasing foreign capital flows and bank borrowings to these countries.

In the first time period of the study, it is found that Chilean Peso, Colombian Peso and Peruvian Sol have the smallest reconstruction error. This finding is convenient with the principal component analysis of the first time period. The contribution of Chilean Peso and Peruvian Sol were 36% to the third explanatory factor in the first period.

The currencies of some of the emerging market countries located in Latin America have small reconstruction error. Before the global crisis occurred in 2008, some Latin American countries like Chile, Colombia, Mexico and Peru supported their program against the inflation with the floating rate regime.

Chile, Mexico, and Peru are the countries that faced with the global crisis with the highest savings rate by increasing their foreign exchange reserves, reducing their external debts and savings when commodity prices and capital flows were high. Along with these three countries, Brazil and Colombia also had well-managed economies and they successfully achieved an economic recovery by preserving their macro stability.

Furthermore, Argentine Peso, Hungarian Forint and Turkish Lira have the highest reconstruction error. These currencies were decomposed in the emerging markets currencies. The reasons behind that result are such as, high current deficit, high inflation, increasing employment rates, political issues, lack of understanding the global economy and wrong decisions on both monetary and financial policies.

Table 16. Reconstruction Errors in High Liquidity Market Regime (January 2009 – June 2013)

Currency		Reconstruction Error
USDCLP	-	0,0036
USDCOP	-	0,0023
USDPEN	-	0,0021
USDSGD	-	0,0020
USDTHB	-	0,0019
USDIDR	-	0,0017
USDPHP	-	0,0016
USDTWD	-	0,0015
USDMYR	-	0,0015
USDKRW	-	0,0011
USDMXN	-	0,0004
USDHKD		0,0000
USDBRL		0,0003
USDCZK		0,0018
USDZAR		0,0018
USDBGN		0,0018
USDRUB		0,0031
USDPLN		0,0035
USDINR		0,0041
USDRON		0,0043
USDTRY		0,0047
USDHUF		0,0050
USDARS		0,0083

Part 3.2 Empirical Tests in Monetary Tightening Market Regime (July 2013 – December 2019)

During the loose monetary policies that countries implement, efforts to take necessary measures to stabilize financial markets did continue. Considering the importance of monetary policy support as long as it is suitable for country conditions. In the face of the evolvments that led to the crisis, interest rates were reduced in many countries and bailout packages were announced as an emergency measure. These packages included some precautions on monetary tools such as monetary policy tools (interest rates, changes in reserve requirement ratio, exchange rate interventions), financial system tools (deposit guarantees, liquidity injections, expropriations).

As a result of a loose monetary policy which stayed through six years affected the

value of Dollar negatively. According to that, Euro had become appreciated against the Dollar.

The Bulgarian economy has suffered from the contraction that lasted for almost two years after the global crisis. Afterwards, it returned to positive growth in the second half the 2010. The main factors behind that were the improvement in world trade and increased exports with the replenishment of stocks. The structure of the economy was highly based on energy-intensive production. In Romania, new financial measures have been implemented to reduce the budget deficit. Recovery took a long time due to weak domestic demand. The country had managed to survive with the help of strong investment decisions. stagnation of private and public consumption and declining investment.

Suchlike, Czech Republic benefited from strong export data despite of the weak domestic demand. Also, funding system in the Europe did helped many countries in this region.

In the second time period of the study, it is found that Bulgarian Lev, Romanian Leu and Czech Koruna have the smallest reconstruction error. This finding is convenient with the principle component analysis of the second time period. The contribution of Bulgarian Lev, Romanian Leu and Czech Koruna were 40% to the second explanatory factor in the second time period.

Table 17. Reconstruction Errors in Monetary Tightening Market Regime (July 2013 – December 2019)

Currency		Reconstruction Error
USDBGN	-	1,3369
USDRON	-	1,3174
USDCZK	-	1,2966
USDPLN	-	1,2359
USDHUF	-	1,1911
USDSGD	-	0,9240
USDCOP	-	0,7429
USDKRW	-	0,6931
USDPEN	-	0,6769
USDTHB	-	0,6375
USDTWD	-	0,6375
USDMYR	-	0,5693
USDMXN	-	0,5683
USDRUB	-	0,5612
USDTHB	-	0,5381
USDZAR	-	0,4096
USDIDR	-	0,1994
USDINR	-	0,1257
USDHKD	-	0,1113
USDPHP	-	0,0882
USDCLP		0,0055
USDBRL		0,0086
USDTRY		0,0394
USDARS		0,1759

Part 3.3 Empirical Tests in Pandemic (January 2020 – August 2021)

In the third time period of the study, it is found that Taiwanese Dollar, Bulgarian Lev and Czech Koruna have the smallest reconstruction error. When compared with the principle component analysis of the third time period, there were no results have found relative to the reconstruction errors result. The contribution of This finding is convenient with the principle component analysis of the second time period. The contribution of Taiwanese Dollar, Bulgarian Lev and Czech Koruna were less than 15% among to the five explanatory factors in the third time period. This result seems understandable that pandemic had not started as a result of an economic event even the virus expanded to the world and collapsed the whole trade system in the world. So that, it should be analyzed covering the world instead of analyzing in a region. Taiwan became one of the countries that managed to get rid of the pandemic with one of the least damages as a result of the knowledge it gained with the SARS virus previously.

Table 18. Reconstruction Errors in Pandemic (January 2020 – August 2021)

Currency	Reconstruction Error
USDTWD	- 0,0040
USDBGN	- 0,0024
USDCZK	- 0,0021
USDPHP	- 0,0008
USDRON	- 0,0008
USDHKD	- 0,0001
USDSGD	0,0000
USDKRW	0,0003
USDHUF	0,0007
USDMYR	0,0009
USDPLN	0,0010
USDINR	0,0012
USDCLP	0,0020
USDIDR	0,0023
USDZAR	0,0029
USDTHB	0,0043
USDMXN	0,0043
USDCOP	0,0080
USDRUB	0,0097
USDPEN	0,0107
USDBRL	0,0138
USDTRY	0,0178
USDARS	0,0249

In light of these results, it can be said that Brazilian Real and Chilean Peso were the most decomposed from the emerging market currencies in the second time period.

Besides, Peruvian Sol and Colombian Peso were also the most decomposed from the emerging market currencies in the third time period. Moreover, during the periods it is attract the attention that, Argentine Peso and Turkish Lira were the most decomposed negatively from the emerging markets currencies. These countries have not integrated with the world economy. Unfortunately, they could not manage to have monetary, fiscal and exchange rate policies that pursue their micro and macroeconomic stability. They had low investment and savings rate and they were lack of good governance.

CHAPTER IV

RESULTS

Several countries including Turkey has been in the category of developing country and market in the last few decades. Such markets are called emerging markets. They are particularly different from developed markets as they possess vulnerability, easily disturbed by financial crises, and not completely liberalized. Some global factors such as Covid-19 and 2018 global financial crisis easily affect the emerging markets in especially currency-based systems. Therefore, it is important to investigate the impacts of global factors on their currencies in the last few decades.

The main purpose of this thesis is to investigate the impacts of global factors in the last two decades on the emerging market currencies. Historical prices of the emerging markets' currencies were collected between 2009-2021. Principle component analysis and reconstruction error analysis were utilized to analyze the data to narrow the field of cluster, eliminate some data and access the most effective ones in the data set. Then, the explanatory factors in the narrowed cluster were regressed with the global factor data set.

This study also focuses on the currency movements of emerging markets individually. PCA results and the emerging markets currencies were analyzed to minimize the average loss in factors derived from the principle component analysis.

Except the explanatory factors, others thought as noise. The center of attention was to find out the decomposed currencies among the emerging markets. The results show that the countries located in Latin America were caught the 2008 global crisis during the monetary policy changes and they are less affected than other countries. All emerging markets that shown in this study indicate that they responded the results of the crisis more or less the same as the reconstruction errors were lower than zero for the most of the

emerging markets currencies. This finding is clearly seen in the second time period results. But, all countries in the world, with no exception, were caught unprepared to the pandemic. Many isolation measures have been put into effect such as quarantine practices, social distance rule, remote-flexible working conditions, closing of borders dramatically damaged the world trade systems. Each country has made policy changes to reduce the effects of the pandemic as much as its own resources allow. Unfortunately, the above-mentioned characteristics of developing countries outweighed especially in Argentina and Turkey. These two countries were directly opposite among the emerging markets currencies movements. This is reflected in the reconstruction errors analysis for all three time periods.

CHAPTER V

DISCUSSION

This study was designed to investigate impacts of global factors in the last 12 years in the emerging markets including Turkey. This investigation split into two parts to analyze the responses of the emerging markets to the environment changes of the global economy. At first, XLSTAT was utilized to analyze the emerging markets cluster.

Descriptive analysis, the principal components analysis as well as explanatory factor analysis were implemented to identify subscales for the study data and explore main impacts. Afterwards, factors that explained most and have eigenvalues more than 1 were regressed with global factors data independently. The results were briefly presented in the above section. In this section, discussion and explanations of the results achieved from data analysis steps are presented. In addition, some suggestions and recommendations were also noted towards future studies.

5.1 Conclusion

The findings showed that some important global factors such as Covid-19 pandemic and 2008 global financial crisis somewhat effected the emerging markets' currencies. As stated in the introduction part, some of the characteristics of the emerging markets such as shortage resources, income inequalities, weak infrastructures led these markets more vulnerable than developed markets. These negative characteristics is shown up during the decision making on monetary policies, trade agreements between countries and fundings. Therefore, emerging markets should take more precautions and preventing steps to protect their financial systems especially currency issues during such global crisis in the future. The global factors data used in this study rationally selected to scrutinize

the funding of the emerging currencies in both after the global crisis and during the pandemic world.

First of all, KMO and Barlett's Test (Figure 10.) showed that the data set used in the data analysis process is suitable and adequate for further investigations. KMO adequacy was equal to 0.786.

First major finding was that the eigenvalues for all currencies had higher value than 0. Three variables had eigenvalue of 1 and above in the first time period (high liquidity world), five variables had eigenvalue of 1 and above in the second time period (monetary tightening world), five variables had eigenvalue of 1 and above in the third time period (pandemic world), which were reasonable and such variables could explain the process of the data set. These factors could explain the whole data set. Then, in the second part of the study these factors regressed with the global data selected depending on the needs of the emerging markets for funding and the results show that emerging markets response similarly during the crisis even the type of the crisis changes. This finding proves that the emerging markets are highly dependent on developed countries and it is extremely important to understand the vulnerability of the emerging markets.

The majority of the exporters in the world includes US and Europe. And many studies show that the best trade peers of the emerging markets are US & EU. Therefore, any change on their financial stabilities affect the emerging markets dramatically.

Various studies advocate that 2Y and 10Y US Treasury Bonds have a sufficient effect on demand of emerging markets funding. Furthermore, Eurozone leading indicators were chosen to measure cost of borrowing that the emerging markets should stand - included both LIBOR, swaps and government bonds and as many emerging markets trades link to Eurozone. On the other hand, it is hugely important to understand the environment in developed markets economies, so that both Bloomberg US and EU

Financial Conditions Indices were added to the global data set. Bloomberg Commodity Index and Bloomberg Industrial Metals Subindex were picked too owing to have a broad perspective to realize the relationship between the global factors and emerging markets' currencies movements.

Regressions split into time periods that are called high liquidity world, monetary tightening world and the pandemic world. These time periods were explained above.

According to the regressions results show that especially EURUSD currency and US Dollar Index have high correlations with the emerging markets' currencies for both two time periods. And this result demonstrates that emerging markets are strictly dependent on the developed markets. This finding also reveals that on any type of crisis, emerging markets should watch the developed markets economic environment as there is no boundaries at all in the world.

5.2 Further Research

This study aimed to discuss the impacts of the 2008 and 2019 global crisis on the emerging markets' currencies. The study is therefore divided into three time periods.

In order to further investigate this topic, more, richer and recent variables and data should be collected and analyzed to identify the impacts of global factors on the emerging markets.

Even Bloomberg Commodity Index and Bloomberg Industrial Metals Subindex were chosen to analyze the industry sector, there are other sectors were affected dramatically such as health, transportation, education, tourism. So that, other sectors should also be considered for deeper understanding of the impacts of the most recent global economic crisis on the companies and business sectors.

Finally, for future investigations, it is recommended that global factors data should be collected from more economic indicators that show the tendency for manufacturing

and consuming as well as the main economic indicators such as inflation, PMI data, employment rates to see the overall effects on their revenues and financial situations. By collecting more data and mixed methodology of research, statistical and case understandings of global crisis will be possible.



APPENDIX A

Security	USDARS	USD8L	USD8N	USDCLP	USDCOP	USDCZK	USDHKD	USDHUF	USDINR	USDIDR	USDMYR	USDMXN	USDPEN	USDPHP	USDPLN	USDRON	USD RUB	USD SGD	USDZAR	USD KRW	USD THB	USD TRY	
31.08.2021	97,74	5,15	1,66	774,14	3.776,54	21,52	7,78	295,53	73,01	14.268,00	4,16	20,07	4,09	49,75	3,83	4,18	73,45	1,34	14,52	1.159,46	27,67	32,23	8,32
30.07.2021	96,69	5,21	1,65	758,71	3.876,35	21,48	7,77	301,90	74,42	14.463,00	4,22	19,87	4,07	50,01	3,85	4,14	73,17	1,35	14,60	1.150,09	27,96	32,90	8,45
30.06.2021	95,72	4,97	1,65	734,42	3.755,08	21,51	7,77	296,32	74,33	14.500,00	4,15	19,94	3,87	48,81	3,81	4,16	73,15	1,35	14,29	1.126,28	27,88	32,03	8,71
31.05.2021	94,68	5,22	1,60	722,12	3.709,80	20,80	7,76	284,03	72,62	14.280,00	4,13	19,95	3,84	47,70	3,66	4,02	73,41	1,32	13,74	1.110,99	27,56	31,19	8,49
30.04.2021	93,55	5,44	1,63	710,45	3.745,22	21,52	7,77	299,62	74,08	14.445,00	4,09	20,25	3,79	48,14	3,79	4,10	75,30	1,33	14,50	1.112,31	27,90	31,16	8,29
31.03.2021	91,99	5,63	1,67	719,00	3.663,44	22,27	7,77	308,63	73,11	14.525,00	4,15	20,43	3,74	48,54	3,95	4,19	75,65	1,34	14,78	1.131,83	28,50	31,24	8,25
26.02.2021	89,83	5,60	1,61	725,39	3.645,04	21,67	7,76	299,93	73,47	14.235,00	4,05	20,86	3,65	48,59	3,74	4,04	74,57	1,33	15,12	1.123,53	27,88	30,44	7,43
29.01.2021	87,31	5,47	1,61	732,35	3.569,55	21,46	7,75	294,54	72,95	14.030,00	4,04	20,57	3,64	48,08	3,73	4,02	75,88	1,33	15,16	1.118,60	28,02	29,92	7,31
31.12.2020	84,15	5,19	1,60	710,50	3.428,26	21,47	7,75	296,94	73,07	14.050,00	4,02	19,91	3,62	48,03	3,73	3,98	74,04	1,32	14,69	1.086,51	28,09	29,96	7,44
30.11.2020	81,31	5,36	1,64	767,40	3.596,93	22,01	7,75	300,52	74,05	14.120,00	4,07	20,18	3,61	48,13	3,76	4,09	76,44	1,34	15,47	1.106,45	28,57	30,29	7,82
30.10.2020	78,32	5,74	1,68	773,83	3.865,19	23,39	7,75	314,57	74,11	14.625,00	4,16	21,18	3,62	48,41	3,96	4,18	79,40	1,37	16,24	1.134,76	28,58	31,16	8,34
30.09.2020	76,18	5,61	1,67	784,31	3.828,40	23,10	7,75	310,18	73,77	14.880,00	4,16	22,11	3,60	48,49	3,87	4,16	77,66	1,37	16,75	1.170,17	29,02	31,60	7,72
31.08.2020	74,18	5,49	1,64	776,66	3.741,04	22,00	7,75	297,79	73,62	14.563,00	4,16	21,89	3,54	48,40	3,68	4,05	74,01	1,36	16,94	1.187,76	29,41	31,08	7,34
31.07.2020	72,32	5,22	1,66	757,73	3.732,71	22,28	7,75	292,08	74,82	14.600,00	4,24	22,28	3,53	49,05	3,75	4,10	74,13	1,37	17,07	1.191,03	29,38	31,26	6,97
30.06.2020	70,46	5,47	1,74	821,24	3.758,06	23,74	7,75	315,51	75,51	14.265,00	4,29	22,99	3,54	49,82	3,96	4,31	71,20	1,39	17,35	1.202,74	29,56	30,91	6,85
29.05.2020	68,53	5,34	1,76	806,47	3.730,76	24,28	7,75	312,19	75,62	14.610,00	4,35	22,18	3,43	50,61	4,01	4,36	70,14	1,41	17,55	1.237,57	30,02	31,81	6,82
30.04.2020	66,83	5,49	1,79	835,53	3.963,61	24,75	7,75	322,12	75,10	14.882,00	4,30	24,17	3,38	50,42	4,15	4,42	74,36	1,41	18,53	1.204,44	29,74	32,47	6,99
31.03.2020	64,40	5,21	1,77	853,79	4.065,37	24,80	7,75	326,95	75,63	16.310,00	4,32	23,67	3,43	50,69	4,13	4,38	78,58	1,42	17,84	1.218,54	30,26	32,75	6,62
28.02.2020	62,21	4,47	1,77	820,93	3.524,13	23,09	7,79	307,10	72,18	14.318,00	4,22	19,64	3,45	50,98	3,93	4,37	66,84	1,39	15,66	1.214,73	30,29	31,52	6,25
31.01.2020	60,35	4,28	1,76	800,54	3.420,57	22,75	7,76	304,10	71,36	13.655,00	4,10	18,84	3,38	50,89	3,87	4,31	63,96	1,36	15,03	1.191,74	30,24	31,22	5,98
31.12.2019	59,87	4,02	1,74	752,87	3.287,23	22,69	7,79	295,21	71,38	13.866,00	4,09	18,93	3,31	50,66	3,79	4,27	61,95	1,35	14,00	1.155,84	29,99	29,71	5,95
29.11.2019	59,91	4,24	1,78	809,46	3.517,05	23,19	7,83	303,66	71,74	14.108,00	4,18	19,53	3,40	50,87	3,92	4,34	64,34	1,37	14,67	1.181,46	30,51	30,21	5,75
31.10.2019	59,65	4,02	1,75	741,36	3.380,29	22,88	7,84	294,67	70,93	14.043,00	4,18	19,23	3,34	50,74	3,82	4,26	64,14	1,36	15,10	1.163,72	30,45	30,17	5,71
30.09.2019	57,59	4,16	1,79	728,66	3.477,98	23,67	7,84	307,26	70,87	14.195,00	4,19	19,73	3,37	51,84	4,01	4,35	64,83	1,38	15,14	1.196,38	31,04	30,60	5,65
30.08.2019	59,50	4,15	1,78	721,62	3.442,29	23,63	7,84	301,49	71,41	14.198,00	4,21	20,06	3,39	52,09	3,99	4,30	66,72	1,39	15,20	1.211,35	31,33	30,64	5,83
31.07.2019	43,88	3,81	1,77	697,22	3.279,53	23,20	7,83	294,39	68,80	14.022,00	4,13	19,15	3,30	50,89	3,87	4,27	63,66	1,37	14,34	1.183,01	31,10	30,91	5,58
28.06.2019	42,48	3,85	1,72	678,73	3.211,36	22,36	7,81	284,10	69,03	14.126,00	4,13	19,22	3,29	51,30	3,73	4,16	63,22	1,35	14,09	1.154,80	30,99	30,68	5,79
31.05.2019	44,79	3,92	1,75	710,21	3.379,55	23,14	7,84	290,94	69,70	14.269,00	4,19	19,62	3,38	52,17	3,83	4,25	65,44	1,37	14,58	1.190,91	31,60	31,53	5,84
30.04.2019	44,22	3,92	1,75	676,76	3.232,97	22,86	7,84	288,78	69,57	14.257,00	4,13	18,95	3,31	51,89	3,82	4,24	64,62	1,36	14,30	1.168,15	30,91	31,91	5,97
29.03.2019	43,32	3,92	1,74	679,72	3.188,74	23,02	7,85	286,26	69,16	14.243,00	4,08	19,43	3,32	52,55	3,84	4,25	65,76	1,36	14,50	1.135,18	30,83	31,74	5,57
28.02.2019	39,14	3,76	1,72	654,63	3.080,11	22,54	7,85	277,75	70,75	14.069,00	4,07	19,28	3,30	51,70	3,78	4,17	65,97	1,35	14,08	1.124,44	30,80	31,58	5,34
31.01.2019	37,31	3,65	1,71	654,54	3.106,50	22,49	7,85	276,00	71,09	13.973,00	4,10	19,11	3,33	52,17	3,72	4,14	65,38	1,35	13,25	1.112,72	30,72	31,23	5,16
31.12.2018	37,67	3,88	1,71	694,00	3.254,25	22,43	7,83	279,94	69,77	14.390,00	4,13	19,65	3,37	52,56	3,74	4,06	69,35	1,36	14,35	1.110,95	30,55	32,33	5,29
30.11.2018	37,75	3,87	1,73	672,63	3.235,24	22,94	7,82	285,97	69,58	14.302,00	4,18	20,37	3,38	52,44	3,79	4,11	67,09	1,37	13,87	1.120,75	30,82	32,94	5,22
31.10.2018	35,91	3,72	1,73	696,80	3.220,01	22,92	7,84	286,98	73,96	15.203,00	4,18	20,34	3,37	53,43	3,84	4,12	65,88	1,39	14,79	1.139,82	30,95	33,11	5,58
28.09.2018	41,31	4,05	1,69	656,83	2.966,17	22,21	7,83	278,82	72,49	14.903,00	4,14	18,72	3,30	54,03	3,69	4,01	65,56	1,37	14,14	1.109,30	30,53	32,32	6,06
31.08.2018	36,88	4,06	1,69	682,80	3.047,77	22,21	7,85	281,53	71,00	14.710,00	4,11	19,09	3,29	53,56	3,70	4,00	67,47	1,37	14,69	1.113,07	30,72	32,77	6,54
31.07.2018	27,43	3,76	1,67	636,67	2.889,23	21,88	7,85	274,36	68,55	14.414,00	4,07	18,65	3,27	53,10	3,66	3,95	62,53	1,36	13,28	1.118,73	30,63	33,21	4,91
29.06.2018	28,93	3,88	1,67	653,90	2.931,61	22,24	7,85	281,79	68,47	14.330,00	4,04	19,91	3,29	53,37	3,74	3,99	62,78	1,36	13,73	1.114,67	30,48	33,04	4,59
31.05.2018	24,97	3,72	1,67	632,03	2.890,35	22,09	7,84	273,40	67,41	13.896,00	3,98	19,91	3,27	52,53	3,69	3,99	62,41	1,34	12,70	1.077,24	29,96	32,07	4,53
30.04.2018	20,54	3,51	1,62	613,66	2.802,64	21,19	7,85	259,61	66,66	13.913,00	3,92	18,71	3,25	51,74	3,51	3,86	62,98	1,33	12,46	1.068,05	29,61	31,55	4,06
30.03.2018	20,14	3,31	1,59	603,90	2.794,06	20,56	7,85	253,55	65,18	13.728,00	3,86	18,18	3,23	52,20	3,42	3,78	57,34	1,31	11,84	1.063,63	29,11	31,18	3,96

28.02.2018	20,12	3,25	1,60	594,31	2.864,40	20,84	7,83	257,35	65,18	13.751,00	3,92	18,84	3,27	52,16	3,42	3,82	56,35	1,32	11,80	1.083,00	29,28	31,49	3,80
31.01.2018	19,64	3,19	1,58	601,41	2.830,82	20,36	7,82	249,74	63,59	13.386,00	3,90	18,60	3,22	51,34	3,34	3,75	56,19	1,31	11,85	1.067,75	29,14	31,34	3,76
29.12.2017	18,62	3,31	1,63	615,43	2.985,78	21,29	7,81	258,91	63,87	13.555,00	4,05	19,66	3,24	49,85	3,48	3,89	57,69	1,34	12,38	1.067,40	29,73	32,57	3,80
31.01.2017	17,30	3,27	1,64	648,73	3.016,37	21,43	7,81	263,05	64,46	13.526,00	4,09	18,63	3,23	50,37	3,53	3,90	58,43	1,35	13,70	1.087,97	30,01	32,64	3,82
31.10.2017	17,65	3,27	1,68	635,34	3.041,93	22,04	7,80	267,38	64,75	13.563,00	4,23	19,15	3,25	51,55	3,64	3,95	58,34	1,36	14,13	1.120,34	30,16	32,22	3,79
29.09.2017	17,32	3,16	1,66	639,11	2.937,65	22,00	7,81	263,74	65,28	13.472,00	4,22	18,25	3,27	50,87	3,65	3,89	57,55	1,36	13,56	1.145,44	30,32	33,31	3,56
31.08.2017	17,34	3,15	1,64	626,90	2.946,39	21,92	7,83	256,71	63,91	13.342,00	4,27	17,89	3,24	51,20	3,57	3,86	58,04	1,36	13,00	1.127,55	30,17	33,18	3,45
31.07.2017	17,64	3,13	1,65	651,34	2.985,98	22,03	7,81	256,90	64,19	13.325,00	4,28	17,80	3,24	50,49	3,59	3,85	59,78	1,36	13,19	1.119,32	30,21	33,30	3,52
30.06.2017	16,63	3,31	1,71	663,90	3.045,67	22,86	7,81	270,29	64,58	13.348,00	4,29	18,12	3,25	50,47	3,70	3,99	58,87	1,38	13,07	1.144,14	30,43	33,93	3,52
31.05.2017	16,10	3,23	1,74	672,55	2.916,30	23,44	7,79	274,16	64,51	13.323,00	4,28	18,62	3,27	49,82	3,72	4,06	56,62	1,38	13,12	1.119,65	30,12	34,04	3,53
28.04.2017	15,40	3,18	1,80	667,35	2.943,00	24,63	7,78	287,05	64,25	13.329,00	4,34	18,82	3,24	50,11	3,88	4,17	56,93	1,40	13,37	1.137,65	30,21	34,59	3,55
31.03.2017	15,39	3,12	1,84	660,17	2.873,98	25,38	7,77	289,83	64,85	13.322,00	4,43	18,72	3,25	50,20	3,97	4,27	56,24	1,40	13,41	1.118,45	30,35	34,35	3,64
28.02.2017	15,48	3,11	1,85	650,10	2.925,82	25,55	7,76	291,37	66,69	13.338,00	4,44	20,11	3,27	50,27	4,07	4,28	58,38	1,40	13,13	1.130,28	30,68	34,94	3,65
31.01.2017	15,90	3,15	1,81	647,30	2.923,38	25,02	7,76	287,01	67,87	13.369,00	4,43	20,83	3,27	49,82	4,00	4,17	60,19	1,41	13,48	1.161,31	31,39	35,10	3,77
30.12.2016	15,88	3,26	1,86	670,40	3.002,00	25,70	7,76	294,36	67,92	13.473,00	4,49	20,73	3,36	49,60	4,19	4,31	61,54	1,45	13,74	1.205,83	32,33	35,84	3,52
30.11.2016	15,87	3,39	1,85	674,25	3.073,67	25,54	7,76	295,41	68,39	13.555,00	4,47	20,57	3,41	49,68	4,21	4,25	64,11	1,43	14,09	1.168,96	31,87	35,71	3,44
31.10.2016	15,15	3,19	1,78	653,22	3.006,78	24,61	7,76	280,89	66,78	13.048,00	4,19	18,86	3,36	48,45	3,92	4,10	63,39	1,39	13,47	1.143,78	31,56	35,03	3,09
30.09.2016	15,31	3,26	1,74	657,33	2.882,06	24,04	7,76	274,35	66,61	13.042,00	4,14	19,39	3,38	48,47	3,82	3,96	62,88	1,36	13,72	1.101,13	31,36	34,59	3,00
31.08.2016	14,93	3,23	1,75	679,86	2.972,00	24,22	7,76	277,55	66,96	13.270,00	4,07	18,78	3,39	46,57	3,91	3,99	65,40	1,36	14,73	1.114,80	31,75	34,63	2,96
29.07.2016	15,01	3,25	1,75	655,70	3.071,30	24,19	7,76	278,70	67,00	13.112,00	4,07	18,75	3,35	47,15	3,90	3,99	65,94	1,34	13,88	1.120,24	31,95	34,78	2,99
30.06.2016	15,05	3,21	1,76	663,24	2.920,35	24,39	7,76	284,23	67,53	13.210,00	4,03	18,28	3,29	47,16	3,94	4,07	63,87	1,35	14,73	1.151,80	32,26	35,12	2,88
31.05.2016	13,99	3,61	1,76	691,28	3.090,18	24,27	7,77	281,72	67,26	13.648,00	4,13	18,47	3,38	46,78	3,94	4,06	66,72	1,38	15,71	1.191,93	32,62	35,77	2,95
29.04.2016	14,26	3,44	1,71	660,45	2.849,97	23,62	7,76	272,69	66,33	13.180,00	3,90	17,18	3,29	46,91	3,82	3,91	64,77	1,34	14,23	1.139,40	32,27	34,90	2,80
31.03.2016	14,70	3,59	1,72	667,70	3.002,20	23,76	7,76	275,92	66,25	13.339,00	4,07	18,28	3,31	45,97	3,73	3,93	66,90	1,35	14,77	1.143,42	32,21	35,13	2,82
29.02.2016	15,84	4,02	1,80	696,01	3.292,80	24,89	7,78	285,25	68,42	13.375,00	4,20	18,14	3,52	47,51	4,00	4,11	75,19	1,41	15,87	1.236,65	33,30	35,63	2,97
29.01.2016	13,95	4,00	1,81	711,60	3.284,99	24,95	7,79	287,24	67,79	13.778,00	4,15	18,11	3,47	47,74	4,08	4,20	75,55	1,42	15,89	1.199,13	33,33	35,69	2,95
31.12.2015	12,93	3,96	1,80	708,60	3.174,50	24,87	7,75	290,44	66,15	13.788,00	4,29	17,21	3,41	46,91	3,92	4,16	72,52	1,42	15,47	1.175,06	32,86	36,03	2,92
30.11.2015	9,69	3,87	1,85	711,12	3.146,25	25,59	7,75	294,25	66,67	13.847,00	4,26	16,58	3,38	47,21	4,04	4,22	66,42	1,41	14,45	1.157,90	32,69	35,81	2,91
30.10.2015	9,51	3,86	1,78	691,41	2.896,60	24,62	7,75	282,16	65,27	13.684,00	4,30	16,50	3,29	46,85	3,86	4,03	63,95	1,40	13,82	1.140,54	32,60	35,62	2,92
30.09.2015	9,42	3,95	1,75	696,38	3.087,44	24,33	7,75	280,46	65,59	14.653,00	4,40	16,92	3,23	46,73	3,80	3,95	65,36	1,42	13,85	1.185,39	32,99	36,37	3,03
31.08.2015	9,30	3,62	1,74	691,97	3.052,50	24,12	7,75	279,54	66,48	14.067,00	4,19	16,75	3,24	46,78	3,78	3,95	64,22	1,41	13,28	1.182,90	32,66	35,83	2,91
31.07.2015	9,19	3,42	1,78	671,88	2.880,38	24,65	7,75	279,63	64,14	13.539,00	3,83	16,11	3,19	45,74	3,77	4,01	61,71	1,37	12,68	1.170,31	31,68	35,00	2,77
30.06.2015	9,09	3,10	1,76	639,12	2.606,00	24,47	7,75	282,62	63,65	13.339,00	3,77	15,74	3,18	45,11	3,76	4,02	55,34	1,35	12,17	1.115,49	30,87	33,80	2,68
29.05.2015	8,99	3,18	1,78	691,41	2.532,27	24,96	7,75	281,46	63,83	13.224,00	3,67	15,38	3,16	44,59	3,74	4,04	52,34	1,35	12,15	1.108,19	30,70	33,70	2,66
31.04.2015	8,91	3,01	1,74	611,90	2.382,60	24,46	7,75	270,47	63,42	12.963,00	3,56	15,35	3,13	44,59	3,60	3,94	51,59	1,32	11,91	1.072,29	30,62	33,02	2,67
30.03.2015	8,82	3,20	1,82	625,29	2.599,62	25,68	7,75	279,98	62,50	13.074,00	3,70	15,26	3,10	44,70	3,80	4,11	58,19	1,37	12,13	1.109,69	31,31	32,55	2,60
27.02.2015	8,73	2,84	1,75	617,65	2.499,59	24,58	7,76	270,37	61,84	12.932,00	3,60	14,95	3,09	44,10	3,71	3,96	61,75	1,36	11,66	1.098,00	31,46	32,36	2,51
30.01.2015	8,64	2,68	1,73	634,76	2.440,31	24,58	7,75	275,25	61,87	12.672,00	3,63	14,98	3,06	44,11	3,71	3,93	69,47	1,35	11,65	1.093,68	31,53	32,76	2,44
31.12.2014	8,47	2,66	1,62	606,45	2.376,51	22,86	7,76	261,64	63,04	12.888,00	3,50	14,75	2,98	44,72	3,54	3,70	58,25	1,33	11,57	1.090,98	31,66	32,91	2,34
28.11.2014	8,52	2,57	1,57	608,25	2.217,05	22,19	7,75	246,19	62,03	12.206,00	3,38	13,93	2,92	44,91	3,36	3,56	49,47	1,30	11,06	1.108,06	30,96	32,85	2,22
31.10.2014	8,50	2,48	1,56	578,06	2.057,60	22,20	7,76	246,00	61,37	12.085,00	3,29	13,48	2,92	44,88	3,38	3,52	43,01	1,29	11,04	1.068,82	30,45	32,60	2,22
30.09.2014	8,43	2,45	1,55	598,31	2.024,85	21,77	7,77	246,07	61,76	12.188,00	3,28	13,43	2,89	44,97	3,31	3,49	39,60	1,28	11,29	1.055,21	30,43	32,43	2,28
29.08.2014	8,40	2,24	1,49	587,48	1.920,58	21,12	7,75	239,77	60,52	11.690,00	3,15	13,08	2,85	43,59	3,21	3,35	37,12	1,25	10,67	1.013,88	29,93	31,94	2,16
31.07.2014	8,21	2,26	1,46	572,11	1.876,50	20,67	7,75	234,28	60,56	11.580,00	3,20	12,22	2,80	43,46	3,12	3,31	35,69	1,25	10,71	1.027,78	30,02	32,19	2,14
30.06.2014	8,13	2,21	1,43	552,95	1.877,44	20,05	7,75	226,21	60,19	11.875,00	3,21	12,97	2,80	43,66	3,04	3,20	33,98	1,25	10,64	1.011,84	29,89	32,44	2,12
30.05.2014	8,08	2,24	1,43	549,84	1.897,10	20,16	7,75	222,08	59,10	11.676,00	3,21	12,86	2,77	43,78	3,04	3,22	34,90	1,25	10,57	1.020,20	30,02	32,84	2,10
30.04.2014	8,00	2,23	1,41	564,85	1.936,40	19,80	7,75	221,38	60,34	11.562,00	3,27	13,08	2,81	44,57	3,03	3,20	35,66	1,25	10,52	1.033,22	30,23	32,37	2,11
31.03.2014	8,00	2,27	1,42	549,47	1.971,20	19,94	7,76	223,19	59,89	11.361,00	3,26	13,06	2,81	44,82	3,03	3,24	35,17	1,26	10,53	1.064,70	30,49	32,42	2,14
28.02.2014	7,87																						

[illegible]

30.06.2017	1.4	2.3	82.6	102.0	-33.1	-28.0	-33.8	1.1	112	95.6	1145	1.7	1.3	1.7	-42	-47	0.5	0.7	0.0	1.3	1.4	1.0	1.1	0.3	1.6	1996.4	76.8
31.05.2017	1.3	2.2	82.8	101.9	-33.9	-31.9	-34.6	1.1	104	96.9	1109	1.8	1.5	1.8	-44	-48	0.3	0.7	0.0	1.2	1.4	1.0	1.1	0.0	1.6	1911.7	77.1
28.04.2017	1.3	2.3	84.0	102.0	-34.8	-32.5	-33.5	1.1	108	96.1	1121	1.8	1.6	1.9	-44	-48	0.3	0.5	-0.1	1.2	1.4	0.8	1.0	0.4	1.6	1878.3	75.9
31.03.2017	1.3	2.4	85.4	102.0	-34.0	-26.3	-31.6	1.1	124	100.4	1162	2.0	1.8	2.0	-44	-48	0.3	0.3	-0.1	1.1	1.4	0.8	0.9	-0.1	1.6	1851.7	72.8
28.02.2017	1.3	2.4	87.7	102.0	-39.5	-36.6	-36.8	1.1	129	101.3	1187	2.0	2.1	2.0	-46	-49	0.2	0.2	-0.1	1.1	1.4	0.6	0.7	-0.3	1.7	1838.7	69.1
31.01.2017	1.2	2.5	87.6	101.9	-42.3	-41.0	-40.5	1.1	120	99.5	1161	2.0	1.9	2.1	-44	-47	0.4	0.0	0.0	1.0	1.3	0.5	0.6	-0.3	1.8	1792.4	70.6
30.12.2016	1.2	2.4	87.5	101.8	-44.1	-40.5	-41.5	1.1	140	102.2	1081	1.9	1.6	2.0	-45	-49	0.2	-0.1	-0.4	1.0	1.3	0.5	0.6	0.0	1.7	1751.2	68.6
30.11.2016	0.8	1.8	86.0	101.8	-45.6	-40.0	-41.4	1.1	133	101.5	1139	1.8	1.4	2.0	-44	-48	0.3	-0.1	-0.3	0.9	1.3	0.5	0.6	-0.1	1.6	1712.1	64.6
31.10.2016	0.8	1.8	84.9	101.8	-42.6	-41.5	-42.0	1.1	173	98.4	1053	1.6	1.4	1.7	-44	-47	0.2	-0.5	-0.2	0.9	1.3	0.3	0.5	0.0	1.5	1690.9	63.8
30.09.2016	0.8	1.6	85.3	101.7	-45.6	-44.5	-48.0	1.1	133	95.5	1020	1.5	1.3	1.6	-46	-47	-0.1	-0.3	-0.3	0.9	1.2	0.3	0.4	-0.2	1.4	1725.7	61.6
31.08.2016	0.8	1.6	82.8	101.8	-47.8	-42.8	-42.0	1.1	134	96.0	969	1.3	1.0	1.5	-45	-46	-0.1	-0.2	-0.2	0.8	1.2	0.3	0.5	-0.1	1.3	1719.5	62.2
29.07.2016	0.7	1.5	84.3	101.9	-47.5	-46.3	-47.9	1.1	119	95.5	1011	1.3	1.0	1.5	-45	-46	-0.1	-0.2	-0.3	0.8	1.1	0.3	0.4	-0.1	1.3	1721.8	59.8
30.06.2016	0.6	1.5	88.8	102.1	-44.8	-41.0	-44.3	1.1	156	96.1	980	1.4	1.3	1.4	-46	-46	-0.1	-0.3	-0.9	0.7	0.9	0.3	0.4	0.1	1.3	1653.2	55.7
31.05.2016	0.9	1.8	85.3	102.3	-41.0	-33.0	-42.0	1.1	142	95.9	918	1.5	1.4	1.6	-44	-46	0.1	-0.1	-0.3	0.7	1.0	0.3	0.4	-0.1	1.5	1676.6	65.7
29.04.2016	0.8	1.8	85.5	102.4	-45.1	-30.5	-44.6	1.1	157	93.1	991	1.6	1.5	1.7	-43	-45	0.3	-0.2	-0.4	0.6	0.9	0.2	0.4	-0.6	1.5	1670.8	66.4
31.03.2016	0.7	1.8	78.8	102.4	-45.6	-32.0	-46.0	1.1	140	94.6	924	1.5	1.7	1.6	-43	-45	0.2	-0.4	-0.5	0.6	0.9	0.2	0.4	-0.5	1.4	1648.1	64.2
29.02.2016	0.8	1.7	75.9	102.6	-39.8	-35.6	-38.8	1.1	206	98.2	921	1.3	1.2	1.4	-44	-45	0.1	-0.7	-0.9	0.6	0.9	0.3	0.5	0.0	1.4	1547.2	61.4
29.01.2016	0.8	1.9	77.2	102.5	-39.9	-30.8	-38.0	1.1	202	99.6	892	1.2	0.6	1.4	-43	-45	0.3	-0.6	-0.6	0.6	0.9	0.3	0.4	0.7	1.5	1562.2	64.6
31.12.2015	1.0	2.3	78.6	102.7	-32.6	-25.0	-32.5	1.1	182	98.6	904	1.3	0.6	1.6	0.0	-0.4	0.6	-0.5	-0.4	0.6	0.8	0.2	0.5	0.5	1.7	1602.8	71.0
30.11.2015	0.9	2.2	81.1	102.7	-42.2	-39.8	-40.4	1.1	161	100.2	875	1.3	0.6	1.6	-0.2	-0.4	0.5	0.0	-0.2	0.4	0.7	0.2	0.4	0.4	1.8	1698.4	75.2
30.10.2015	0.7	2.1	87.4	102.8	-37.8	-29.8	-37.3	1.1	151	96.9	958	1.2	0.4	1.5	-0.1	-0.4	0.5	0.0	-0.1	0.3	0.6	0.1	0.2	-0.5	1.7	1705.8	77.1
30.09.2015	0.6	2.0	87.8	102.8	-34.6	-29.1	-33.5	1.1	245	96.4	966	1.1	0.2	1.4	0.0	-0.3	0.6	-0.7	-0.6	0.3	0.5	0.0	0.1	0.5	1.6	1581.9	73.4
31.08.2015	0.7	2.2	90.9	102.7	-36.6	-22.9	-31.3	1.1	284	95.8	1060	1.3	0.3	1.6	0.1	-0.3	0.8	-0.7	-0.3	0.3	0.5	0.0	0.2	0.5	1.7	1645.4	76.0
31.07.2015	0.7	2.2	91.8	102.7	-29.3	-23.6	-27.9	1.1	121	97.3	1028	1.4	0.8	1.7	0.0	-0.2	0.6	0.3	0.1	0.3	0.5	0.1	0.1	0.8	1.8	1706.6	84.4
30.06.2015	0.6	2.4	102.7	102.7	-31.0	-27.0	-26.0	1.1	182	95.5	1109	1.7	1.2	1.9	0.1	-0.3	0.8	-0.1	-0.3	0.3	0.4	0.0	0.1	0.5	1.8	1735.6	81.2
29.05.2015	0.6	2.1	100.9	102.6	-30.8	-26.3	-29.6	1.1	138	96.9	1166	1.6	1.3	1.8	0.0	-0.3	0.5	0.3	-0.1	0.3	0.4	0.0	0.1	0.2	1.7	1779.3	83.7
30.04.2015	0.6	2.0	103.7	102.6	-34.4	-25.3	-32.5	1.1	146	94.6	1263	1.7	1.5	1.9	0.0	-0.3	0.4	0.3	0.1	0.3	0.4	0.0	0.0	-0.4	1.8	1778.4	84.3
31.03.2015	0.6	1.9	98.1	102.6	-33.0	-27.8	-32.5	1.1	153	98.4	1172	1.6	1.2	1.8	-0.1	-0.2	0.2	0.2	0.0	0.3	0.4	0.0	0.1	0.0	1.6	1740.8	81.7
27.02.2015	0.6	2.0	103.4	102.6	-32.3	-27.6	-31.3	1.1	133	95.3	1184	1.6	1.3	1.8	-0.1	-0.2	0.3	0.4	0.2	0.3	0.4	0.0	0.1	-0.3	1.6	1772.9	82.1
30.01.2015	0.4	1.6	100.8	102.6	-27.5	-23.4	-25.4	1.1	210	94.8	1171	1.4	0.4	1.6	-0.1	-0.2	0.3	-0.1	-0.1	0.3	0.4	0.0	0.2	0.6	1.6	1671.5	76.7
31.12.2014	0.7	2.2	104.3	102.7	-15.1	-15.8	-11.5	1.2	192	96.3	1258	1.2	0.1	1.7	0.0	-0.1	0.5	0.3	0.1	0.3	0.4	0.0	0.1	0.2	1.7	1700.7	79.4
28.11.2014	0.5	2.2	112.9	102.8	-17.5	-15.0	-14.4	1.2	133	88.4	1294	1.4	0.6	1.8	0.1	-0.1	0.7	0.6	0.7	0.2	0.3	0.0	0.1	0.2	1.8	1779.5	83.6
31.10.2014	0.5	2.3	111.7	102.8	-13.8	-12.0	-11.0	1.3	140	86.9	1339	1.6	0.9	1.9	0.1	-0.1	0.8	0.6	0.5	0.2	0.3	0.0	0.0	-0.1	1.8	1708.1	82.2
30.09.2014	0.6	2.5	118.7	102.8	-15.5	-14.0	-9.8	1.3	163	85.9	1320	1.6	1.0	2.0	0.1	-0.1	0.9	0.5	0.7	0.2	0.3	0.0	0.0	0.4	1.9	1698.4	84.0
29.08.2014	0.5	2.3	126.6	102.7	-10.8	-15.3	-5.8	1.3	120	82.7	1414	1.9	1.3	2.1	0.2	0.0	0.9	0.9	0.5	0.2	0.3	0.0	0.0	0.2	2.0	1748.7	85.9
31.07.2014	0.5	2.6	127.9	102.7	-4.8	-4.8	-4.0	1.3	170	81.5	1407	2.0	1.5	2.3	0.3	0.0	1.2	0.6	0.5	0.2	0.3	0.0	0.0	0.3	2.1	1714.4	85.8
30.06.2014	0.5	2.5	134.6	102.7	-7.0	-4.5	-4.5	1.4	116	79.8	1376	2.1	1.7	2.2	0.3	0.0	1.2	0.9	0.7	0.2	0.3	0.0	0.1	-0.4	2.1	1745.4	87.7
30.05.2014	0.4	2.5	133.8	102.7	-4.3	-5.5	-1.3	1.4	114	80.4	1342	2.0	1.6	2.2	0.4	0.1	1.4	0.9	0.5	0.2	0.3	0.0	0.0	-0.2	2.0	1715.2	90.5
30.04.2014	0.4	2.6	137.8	102.7	-1.9	-1.8	-0.9	1.4	134	79.5	1306	2.0	1.7	2.2	0.6	0.1	1.5	0.9	0.3	0.2	0.3	0.0	0.0	0.6	2.1	1807.9	96.5
31.03.2014	0.4	2.7	134.5	102.7	-5.3	-3.8	-4.5	1.4	139	80.1	1269	1.9	1.7	2.1	0.6	0.1	1.6	0.8	0.5	0.2	0.3	0.0	0.1	0.2	2.1	1675.9	89.3
28.02.2014	0.3	2.6	134.0	102.7	-7.0	-5.0	-6.0	1.4	140	79.7	1289	1.9	1.9	2.2	0.7	0.1	1.6	0.7	0.6	0.2	0.3	0.0	0.1	-0.5	2.1	1671.9	91.4
31.01.2014	0.3	2.6	126.1	102.7	-8.0	-5.8	-6.5	1.3	184	81.3	1264	1.9	1.8	2.1	0.6	0.1	1.7	0.4	0.3	0.2	0.3	0.0	0.1	0.7	2.1	1598.5	86.2
31.12.2013	0.4	3.0	125.8	102.6	-10.5	-5.3	-9.8	1.4	137	80.0	1329	1.8	1.6	2.2	0.9	0.1	1.9	0.7	0.7	0.2	0.3	0.1	0.1	-0.2	2.2	1661.3	88.2
29.11.2013	0.3	2.7	124.2	102.7	-15.0	-6.3	-14.3	1.4	137	80.7	1267	1.7	1.4	2.2	0.7	0.1	1.7	0.7	0.6	0.2	0.3	0.1	0.1	0.0	2.2	1628.4	86.1
31.10.2013	0.3	2.6	125.2	102.6	-11.5	-6.8	-10.0	1.4	138	80.2	1311	1.8	1.1	2.2	0.7	0.1	1.7	0.6	0.5	0.2	0.4	0.0	0.1	-0.1	2.2	1602.9	85.4
30.09.2013	0.3	2.6	127.1	102.6	-20.3	-12.0	-19.3	1.4	166	80.2	1326	1.8	1.2	2.2	0.8	0.1	1.8	0.2	0.3	0.2	0.4	0.0	0.0	-0.2	2.2	1543.7	80.0
30.08.2013	0.4	2.8	130.4	102.5	-26.3	-14.2	-25.0	1.3	170	82.1	1305	1.8	1.3	2.1	0.8	0.1	1.9	0.0	0.0	0.3	0.4	0.0	0.1	-0.2	2.2	1472.7	74.7
31.07.2013	0.5	2.6	136.2	102.5	-26.0	-16.3	-22.8	1.3	135	81.5	1263	1.9	1.4	2.2	0.7	0.1	1.7	0.4	0.2	0.3	0.4	0.0	0.1	-0.1	2.1	1507.9	76.5
28.06.2013	0.4	2.5	124.5	102.4	-24.8	-18.0	-20.8	1.3	169	83.1	1271	1.8	1.2	2.0	0.7	0.1	1.7	-0.1	0.1	0.3	0.4	0.0	0.1	0.5	2.2	1433.6	69.1
31.05.2013	0.5	2.1	130.6	102.4	-24.0	-19.2	-20.5	1.3	163	83.4	1369	1.9	1.3	2.2	0.5	0.0	1.5	0.1	0.3	0.3	0.4	0.0	0.1	0.0	2.0	1471.9	74.6

31.05.2010	0.8	3.3	125.4	101.4	-31.7	-46.9	-22.0	1.2	32.1	86.6	136.5	1.7	0.6	2.0	1.6	0.3	2.7	-1.5	-1.2	0.5	0.8	0.2	0.2	0.7	2.3	1079.8	66.7
30.04.2010	1.0	3.7	134.7	101.7	-25.3	-34.6	-16.1	1.3	22.1	81.9	178.8	2.0	1.6	2.4	2.0	0.5	3.0	-0.2	-0.5	0.3	0.5	0.2	0.2	0.1	2.4	1198.6	76.5
31.03.2010	1.0	3.8	132.2	101.9	-22.8	-29.6	-16.9	1.4	17.6	81.1	184.8	1.8	1.5	2.3	2.1	0.5	3.1	0.0	-0.2	0.3	0.4	0.2	0.2	-0.5	2.5	1200.5	83.0
26.02.2010	0.8	3.6	133.8	102.0	-18.8	-28.4	-12.7	1.4	19.5	80.4	180.5	1.7	1.4	2.2	2.1	0.5	3.1	-0.2	-0.7	0.3	0.4	0.1	0.2	-0.5	2.5	1133.4	77.4
29.01.2010	0.8	3.6	129.1	101.9	-14.9	-23.9	-11.1	1.4	24.6	79.5	158.9	1.8	1.3	2.3	2.3	0.6	3.2	-0.6	-0.8	0.2	0.4	0.1	0.1	0.7	2.7	1119.5	79.3
31.12.2009	1.1	3.8	130.2	101.8	-19.3	-25.2	-15.5	1.4	21.7	77.9	174.2	1.9	1.2	2.4	2.4	0.8	3.4	-0.5	-0.6	0.3	0.4	0.0	0.2	-0.2	2.7	1388.5	86.7
30.11.2009	0.7	3.2	136.5	101.7	-17.4	-21.0	-13.2	1.5	24.5	74.9	161.9	1.6	1.1	2.1	2.2	0.8	3.2	-0.9	-1.0	0.3	0.5	0.0	0.1	-0.4	2.6	1149.0	88.1
30.10.2009	0.9	3.4	131.9	101.7	-14.3	-21.9	-10.4	1.5	30.7	76.3	154.8	1.5	0.6	2.0	2.4	0.7	3.2	-1.5	-1.1	0.3	0.6	0.0	0.2	-0.3	2.6	1106.2	89.4
30.09.2009	0.9	3.3	127.7	101.6	-20.6	-28.9	-15.5	1.5	22.6	76.7	149.0	1.3	0.3	1.8	2.4	0.7	3.2	-1.1	-1.0	0.3	0.6	0.1	0.2	-0.3	2.8	1127.0	93.0
31.08.2009	1.0	3.4	125.7	101.4	-28.5	-33.4	-17.9	1.4	20.0	76.2	150.1	1.0	-0.1	1.7	2.4	0.6	3.3	-1.5	-1.5	0.3	0.8	0.1	0.2	-0.1	2.6	1085.6	88.6
31.07.2009	1.1	3.5	126.5	101.2	-20.0	-30.0	-17.0	1.4	25.9	76.3	143.1	1.3	0.3	1.8	2.4	0.6	3.3	-1.9	-1.6	0.5	0.9	0.2	0.2	-0.6	2.6	1044.0	79.1
30.06.2009	1.1	3.5	122.5	101.0	-22.7	-32.1	-14.0	1.4	20.4	80.1	124.1	1.4	0.4	1.8	2.5	0.8	3.4	-2.7	-2.0	0.6	1.1	0.2	0.3	0.3	2.6	964.1	68.5
29.05.2009	0.9	3.5	124.9	100.9	-29.5	-25.5	-22.0	1.4	28.9	79.3	117.4	1.4	0.0	1.8	2.6	0.9	3.6	-2.9	-1.8	0.7	1.2	0.1	0.3	-0.5	2.5	970.0	70.5
30.04.2009	0.9	3.1	110.6	100.7	-31.0	-26.5	-19.0	1.3	36.5	84.6	111.1	0.8	-0.4	1.5	2.4	0.9	3.2	-4.1	-2.9	1.0	1.6	0.1	0.3	-0.4	2.6	915.0	61.9
31.03.2009	0.8	2.7	109.8	100.5	-40.0	-42.3	-26.0	1.3	44.1	85.4	101.4	0.5	-0.7	1.3	2.2	0.9	3.0	-5.2	-4.4	1.2	1.7	0.2	0.4	-0.7	2.4	865.2	47.2
27.02.2009	1.0	3.0	106.0	100.4	-40.0	-45.2	-39.9	1.3	46.4	88.0	91.3	0.4	-1.3	1.0	2.2	1.0	3.1	-5.5	-4.7	1.3	1.8	0.2	0.4	0.1	2.4	793.9	41.7
30.01.2009	0.9	2.8	110.9	100.4	-48.4	-53.8	-26.2	1.3	44.8	86.0	91.5	0.1	-2.5	1.1	2.5	1.2	3.3	-5.1	-4.6	1.2	1.7	0.2	0.3	0.3	2.6	838.8	51.4
31.12.2008	0.8	2.2	117.2	100.6	-34.5	-40.0	-17.5	1.4	40.0	81.3	96.9	-0.5	-5.4	0.1	2.3	1.7	3.0	-6.4	-7.4	1.4	1.8	0.1	0.3	-0.3	2.6	920.2	62.4
28.11.2008	1.0	2.9	122.8	100.1	-40.0	-46.0	-24.5	1.3	55.3	86.5	107.7	-0.8	-5.6	0.4	2.7	2.0	3.3	-4.6	-8.8	2.2	2.6	0.0	0.4	0.3	2.4	892.9	61.2
31.10.2008	1.5	4.0	132.0	100.1	-34.0	-75.0	-16.0	1.3	59.9	85.6	120.3	-0.2	-3.8	0.9	3.2	2.5	3.9	-8.0	-10.0	3.0	3.1	0.4	0.9	0.6	2.3	957.3	69.5
30.09.2008	2.0	3.8	167.8	100.6	-29.3	-120.4	-12.3	1.4	39.4	79.4	164.7	1.0	-0.3	1.6	3.8	3.3	4.0	-7.5	-7.3	4.1	4.0	0.9	1.6	0.3	2.7	1382.4	106.9
29.08.2008	2.4	3.8	189.9	101.1	-12.3	-77.5	-6.2	1.5	20.7	77.4	190.2	1.8	1.4	2.1	4.1	4.3	4.2	-2.3	-2.2	2.8	3.1	1.7	1.9	0.3	2.7	1340.9	117.4
31.07.2008	2.5	3.9	205.1	101.1	-13.6	-25.6	-5.9	1.6	22.9	73.2	205.2	2.1	1.8	2.3	4.3	4.5	4.4	-2.5	-2.2	2.8	3.1	1.7	1.9	0.5	2.6	1266.7	123.7
30.06.2008	2.6	4.0	210.0	101.0	-14.4	-27.7	-7.8	1.6	24.0	72.5	216.3	2.6	2.6	2.5	4.6	4.7	4.6	-2.4	-2.2	2.8	3.1	1.7	2.2	-0.2	2.6	1402.1	122.6
30.05.2008	2.6	4.1	213.9	101.2	-10.2	-21.5	-5.7	1.6	17.8	72.9	206.7	2.4	2.5	2.5	4.3	4.3	4.4	-1.6	-2.3	2.7	2.9	1.9	2.0	-0.5	2.5	1325.7	142.9
30.04.2008	2.3	3.7	208.6	101.3	-7.3	-17.3	-3.4	1.6	20.8	72.5	222.1	2.2	2.3	2.3	3.9	4.0	4.1	-2.8	-2.9	2.9	3.0	1.4	1.6	-0.1	2.4	1289.0	152.8
31.03.2008	1.6	3.4	201.6	101.6	-8.3	-15.0	-6.3	1.6	25.6	71.8	225.6	2.1	2.0	2.3	3.6	3.8	3.9	-3.2	-3.3	2.7	2.6	1.3	1.5	0.3	2.4	1437.4	147.2
29.02.2008	1.6	3.5	215.5	101.6	-2.8	-5.3	-1.3	1.5	26.5	75.7	236.9	2.3	2.1	2.4	3.4	3.7	3.9	-3.0	-1.5	3.1	2.9	1.8	1.8	-0.3	2.4	1455.6	143.3
31.01.2008	2.1	3.6	192.3	101.4	-2.7	-4.8	-1.1	1.5	26.2	75.2	207.3	2.1	1.9	2.3	3.6	3.7	3.9	-2.2	-1.4	3.1	3.0	1.9	2.1	0.1	2.4	1406.4	144.7
31.12.2007	3.0	4.0	185.0	102.0	-3.3	-8.5	-1.9	1.5	22.5	76.7	190.2	2.3	2.1	2.3	4.1	4.1	4.3	-2.3	-1.8	4.7	4.6	3.2	3.4	-0.3	2.4	1288.8	163.1
30.11.2007	3.0	3.9	177.2	101.9	-3.1	-5.3	-2.0	1.5	22.9	76.1	199.8	2.2	2.1	2.4	3.9	4.0	4.1	-2.9	-2.3	5.1	4.9	3.1	3.3	0.5	2.5	1601.9	168.6
31.10.2007	3.9	4.5	185.5	101.8	-0.9	-3.2	0.3	1.4	18.5	76.5	216.8	2.2	2.2	2.4	4.1	4.2	4.2	-0.6	-1.2	4.9	4.8	3.9	4.1	-0.1	2.5	1002.4	180.3
28.09.2007	4.0	4.6	178.2	102.2	-1.8	-7.3	-0.5	1.4	18.0	77.7	221.6	2.1	1.9	2.3	4.2	4.0	4.3	-1.3	-1.8	5.2	5.1	3.8	4.1	0.1	2.4	1633.6	174.0
31.08.2007	4.1	4.5	165.6	102.4	-0.8	-3.3	-0.2	1.4	23.4	80.8	216.1	1.9	1.6	2.3	4.1	4.1	4.2	-1.8	-1.6	5.6	5.5	4.1	4.2	0.0	2.4	1261.6	168.3
31.07.2007	4.5	4.7	172.4	102.8	1.1	1.7	2.0	1.4	23.5	80.8	234.4	2.1	1.9	2.4	4.3	4.4	4.3	0.1	0.3	5.4	5.3	4.9	5.0	0.2	2.4	1265.8	175.0
29.06.2007	4.9	5.0	169.7	103.0	1.4	1.0	2.0	1.4	16.2	81.9	231.8	2.3	2.1	2.4	4.5	4.4	4.6	0.6	0.9	5.4	5.4	4.8	4.9	0.4	2.4	1002.4	180.2
31.05.2007	4.9	4.9	172.7	103.0	1.6	1.7	2.0	1.3	13.1	82.3	244.8	2.3	2.3	2.4	4.4	4.3	4.4	0.8	1.1	5.4	5.4	4.7	4.9	0.1	2.3	1636.9	185.2
30.04.2007	4.6	4.6	175.2	102.9	2.2	2.2	2.8	1.4	14.2	81.4	253.3	2.3	2.8	2.4	4.1	4.2	4.2	0.8	1.0	5.4	5.4	4.8	5.0	0.6	2.2	1277.9	188.1
30.03.2007	4.6	4.6	172.0	102.8	2.3	2.1	2.4	1.3	14.6	82.9	233.3	2.5	2.9	2.4	4.0	4.1	4.1	0.9	1.0	5.4	5.3	5.0	5.1	0.5	2.2	1514.2	177.2
28.02.2007	4.6	4.6	171.0	102.6	2.4	2.1	3.1	1.3	15.4	83.6	221.6	2.4	2.7	2.4	3.9	3.9	4.0	0.9	1.0	5.3	5.3	5.1	5.1	0.0	2.2	1496.4	174.5
31.01.2007	4.9	4.8	166.1	102.7	2.1	1.8	2.7	1.3	10.4	84.6	210.6	2.4	2.5	2.4	4.0	4.0	4.1	1.2	1.1	5.4	5.4	5.1	5.1	0.0	2.2	1280.2	176.7



REFERENCES

- [1] Aguiar, M., & Gopinath, G. (2007). Emerging market business cycles: The cycle is the trend. *Journal of political Economy*, 115(1), 69-102.
- [2] Arnold, D. J., & Quelch, J. A. (1998). New strategies in emerging markets. *MIT Sloan Management Review*, 40(1), 7.
- [3] Bekaert, G., & Harvey, C. R. (2003). Emerging markets finance. *Journal of empirical finance*, 10(1-2), 3-55.
- [4] Blanchard, O. J., Faruquee, H., Das, M., Forbes, K. J., & Tesar, L. L. (2010). The initial impact of the crisis on emerging market countries [with comments and discussion]. *Brookings papers on economic activity*, 263-323.
- [5] Bunda, I., Hamann, A. J., & Lall, S. (2009). Correlations in emerging market bonds: The role of local and global factors. *Emerging markets review*, 10(2), 67-96.
- [6] Büberkökü, Ö. (2019). Bazı gelişen piyasa ekonomilerinde garantisiz (uncovered) faiz oranı paritesinin geçerliliğinin incelenmesi. *Maliye Dergisi*, 177, 160-176.
- [7] Divecha, A. B., Drach, J., & Stefek, D. (1992). Emerging markets: a quantitative perspective. *Journal of Portfolio Management*, 19(1), 41.
- [8] Dooley, M. P. (2000). A model of crises in emerging markets. *The economic journal*, 110(460), 256-272.
- [9] Fraga, A., Goldfajn, I., & Minella, A. (2003). Inflation targeting in emerging market economies. *NBER macroeconomics annual*, 18, 365-400.
- [10] Frankel, J., & Poonawala, J. (2010). The forward market in emerging currencies: Less biased than in major currencies. *Journal of International Money and Finance*, 29(3), 585-598.
- [11] González-Rozada, M., & Yeyati, E. L. (2008). Global factors and emerging market spreads. *The Economic Journal*, 118(533), 1917-1936.
- [12] Khanna, T., Palepu, K. G., & Sinha, J. (2005). Strategies that fit emerging markets. *Harvard business review*, 83(6), 4-19.
- [13] Knipphoff, P. (2016). Why Are Emerging Market Currencies Volatile? Retrieved from: <https://www.toptal.com/finance/financial-analysts/emerging-market-currencies>
- [14] London, T., & Hart, S. L. (2004). Reinventing strategies for emerging markets: beyond the transnational model. *Journal of international business studies*, 35(5), 350-370.
- [15] Mody, A. (2003). What is an emerging market. *Geo. J. Int'l L.*, 35, 641.
- [16] Ruiz, A. (2021). Emerging currencies: will the calm last? Retrieved from <https://www.caixabankresearch.com/en/economics-markets/financial-markets/emerging-currencies-will-calm-last>
- [17] Topcu, M., & Gulal, O. S. (2020). The impact of COVID-19 on emerging stock markets. *Finance Research Letters*, 36, 101691.
- [18] World Bank, 1997. Private Capital Flows to Developing Countries. The Road to Financial Integration. The World Bank and Oxford Univ. Press, Washington, DC.

- [19] Fraga, A., Goldfajn, I., & Minella, A. (2003). Inflation targeting in emerging market economies. NBER macroeconomics annual, 18, 365-400.
- [20] Yiğitbaşı, Ş. B. (2009). Gelişen Piyasa Ekonomilerinde Alternatif Para Politikası Stratejileri; Türkiye Ekonomisi Açısından Bir Değerlendirme. Yönetim ve Ekonomi: Celal Bayar Üniversitesi İktisadi ve İdari Bilimler Fakültesi Dergisi, 16(1), 207-225.

