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Exchange Rate, Global Market Conditions, and ETF Returns: A Comparative Study

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Abstract:
This study investigates the role of exchange rates and the global market on a selected country's exchange-traded fund (ETF) return. The dataset is constructed from 12 developed and 7 emerging countries' ETFs for January 2012-July 2022. We employ linear regression with the delta percentage change method. The empirical analysis suggests that there are negative highly significant co-movements between the global market and most selected countries' ETF returns. Meanwhile, exchange rates negatively and highly significantly influences only emerging market ETFs. We concluded that developed market ETFs have a strong negative linkage with the global market returns.

Keywords: exchange-traded fund, market return, exchange rates, macroeconomics.

汇率、全球市场状况和ETF回报：比较研究

摘要 ：
本研究调查了汇率和全球市场对选定国家的交易所交易基金(ETF)回报的影响。该数据集由2012年1月至2022年7月12个发达国家和7个新兴国家的ETF构建。我们采用增量百分比变化法的线性回归。实证分析表明，全球市场与大多数选定国家的ETF回报之间存在高度显着的负向联动。与此同时，汇率仅对新兴市场ETF产生高度显着的负面影响。我们的结论是，发达市场ETF与全球市场回报具有很强的负相关性。

关键词：交易所交易基金、市场回报、汇率、宏观经济学。

1. Introduction

Exchange-traded funds (ETFs) are a basket containing securities instruments such as mutual funds that can be traded during exchange hours. As index funds, ETFs replicate the performance of the designated

indexes as meticulously as possible. The issuers established diversification opportunities for all types of investors at a reduced cost, with adequate taxation and higher transparency, as opposed to conventional mutual funds (Wang & Xu, 2019). ETF share value is determined by the supply and demand and adheres to the exchange trading policy on which they are listed (da Costa Neto et al., 2019). ETFs are new investment products that make the financial market complete by offering various features that were previously unavailable in conventional mutual funds. ETFs have been helpful for investors and capital markets to increase competitiveness in price, new service, and product features (Agapova, 2011).

The sophistication of ETFs as an industry, with participants from diverse specializations and asset classes, is reflected in the high level of sophistication and diversification of products available. Most of these funds aim to directly replicate the performance of certain benchmark indexes (da Costa Neto et al., 2019). The global integration of thriving financial markets has resulted in numerous studies investigating the mechanisms by which equity market movements are transmitted globally (Yavas & Rezayat, 2016). ETFs have become investment vehicles with diverse compositions and sectors such as stocks, bonds, currency, and commodities. Some ETFs are also made with country-specific composition.

ETFs have a large market in developed countries, especially the US, while emerging countries are still inadequate. Emerging countries such as Brazil are among the countries that receive a great flow from capital markets such as the United States, Japan, and Western Europe (Yavas & Rezayat, 2016). The popularity and large market share in the US market raises questions about whether emerging markets have similarities with the US (da Costa Neto et al., 2019). Using developed and emerging ETFs, Zawadzki (2020) argues that ETFs do not provide considerable benefit to their benchmark return, regardless of the level of market development and location.

Several limitations were found in previous studies (Yavas & Rezayat, 2016), which stated that future research could be expanded to include individual countries in Europe; therefore, we chose ETFs from France, Germany, Switzerland, and Eurozone. Studies from (da Costa Neto et al., 2019) also disclosed that studies of ETFs could be gradually expanded especially as emerging markets grow; hence, we use several countries that were rarely used by previous literature by looking at the leading HDI (human development index) and GDP (gross domestic product) indicators. We also take note from a previous study by Zawadzki (2020) that the mentioned study should be expanded by testing other variables such as exchange rate and liquidity as dependent variables for country ETF returns.

This study examines several countries' ETF returns from developed and emerging markets by covering 19 country-specific ETFs from iShares MSCI country funds. This study compares developed and emerging countries' ETFs with a percentage change model using monthly data for January 2012-July 2022. We focus on country ETF research because prior studies infrequently use ETFs of developed and emerging countries in terms of return. We seek to close the gap of previous research by Yavas and Rezayat (2016) on ETF in emerging countries, Europe, and the USA. The main objective of this paper is to expand the literature on the linkages between global equity markets and equity markets for fund managers, investors, hedge traders, and policymakers. Even though ETFs are one of the most popular instruments in the global market, research on country ETFs on emerging markets is still limited. Furthermore, the evidence presented in this paper is of pivotal importance to many investors, especially on emerging markets, providing them with insight into the dynamics associated with ETFs. By examining country ETFs, this study is important to understand whether the exchange rate and global market are determinants of country ETF returns.

Our results confirm strong and negative relationships between exchange rates and the global market with major country ETF returns. We find a strong correlation between one and other ETFs in their respective sectors. By using IVV, which closely tracks the S&P 500 index, we also discovered a strong correlation between the S&P 500 and selected developed countries' ETFs.

1.1. Exchange-Traded Funds (ETFs)

There are many investment vehicles such as stocks, cryptocurrencies, bonds, mutual funds, derivatives, and commodities that investors can buy to make a profit. Higher investment returns come with costs; therefore, there is a risk-return trade-off described as the first fundamental law of finance (Ghysels et al., 2005). Stocks are generally considered as high-risk investment instruments (Singh, 2021). There are no guarantees of gaining a profit once investors buy it. Stock prices also fluctuate rapidly. While cryptocurrencies as financial assets remain spurious (Ariefianto, 2020), as retail investors, we must choose investment products carefully but at the same time produce relatively fair to high returns with minimal risks. Markowitz (1952), a Nobel prize-winning American economist, has valuable invention with modern portfolio theory (MPT), which is a practical strategy used to achieve great investment returns by choosing the optimal mix of high- and low - risk investments. This finding highlights the great benefit of investment diversification because in general, investments are high risk high return or low risk low return.

When an investor buys some stocks and does not have much knowledge about the capital market, it could be considered gambling rather than investing. Since an investor certainly wants to get higher rates of return in

investment, investors must have in-depth knowledge of the financial market. However, investing in high-risk investments is not a simple job; therefore, experienced fund managers manage exchange-traded funds (ETFs) from retail investors to get better returns while minimizing the risk. ETFs could be investment vehicles that promote diversification in the financial market.

ETFs work like baskets that hold many shares of companies. ETFs combine the upside of stocks and mutual funds. Mutual funds are investment instruments in the form of baskets containing stocks, bonds, treasury bonds, and so on, but they cannot be traded in real time during exchange hours (da Costa Neto et al., 2019); meanwhile, ETFs are versatile. Furthermore, ETFs have many attractive features such as low expense fees, instant exposure, transparency, dividend treatment, and tax efficiency (Kallinterakis et al., 2020).

In general, ETFs replicate their underlying index (Levy & Lieberman, 2013), such as the SPDR S&P 500 (SPY), which represents shares of the S&P (Standard & Poor's) 500, a stock index with 500 largest companies in the United States. There are many studies with the scope of implementing investment objectives by issuers, understood as the rate of mimicking the rate of return earned by an index based on an ETF, specifically the US market, even though Zawadzki (2020) discovered that ETFs do not track their underlying indexes well and often have significantly negative values.

ETFs have access to investment diversification depending on the ETF composition. ETFs can have a composition of all stocks or a mix of other derivatives: stocks, bonds, commodities, currencies, sectors, and leverage (da Costa Neto et al., 2019). This diversification has been adjusted by investment managers and issuers to offer many opportunities for investors to choose products that suit their respective risk profiles. In addition, ETFs are generally tax efficient unlike mutual funds. Investment managers have structured ETFs in such a way that they have low taxes because they must rebalance funds by selling securities and relocating assets (Wild, 2015).

1.2. Developed and Emerging Country ETFs

ETFs are well-known instrument vehicles in the global market, especially in the US market, but only a small amount of literature discusses ETFs in emerging markets (Charteris et al., 2014). Although there is growing literature on ETFs, studies on country ETFs remain limited. Yavas and Rezayat (2016) mentioned a co-movement of returns among all country ETFs. Co-movement refers to similar movement of two or more entities and is crucial to the diversification and risk management.

Emerging and developed country ETFs labeled as country ETFs. Country ETFs are classified as sub-sectors in the ETF market and designed to track stock market indices of foreign countries (Levy & Lieberman, 2013). Investors from developed markets pursue fundamentally driven strategies, whereas investors from emerging markets exhibit informational-guided behavior. Emerging market countries show rapid growth and industrialization (Yavas & Rezayat, 2016). Charteris et al. (2014) show that emerging markets have significant feedback trading. Feedback trading refers to an investor using a strategy that calls for buying when prices move up and selling when prices move down (Koutmos, 2014). Feedback trading could occur because ETFs usually replicate their underlying index. Using data from three ETFs of each emerging market of Brazil, China, Mexico, Korea, and India and three ETFs from the US market, da Costa Neto et al. (2019) suggest the evidence of feedback trading from emerging markets such as Brazil, Korea, Mexico, and India, but there is no evidence found in the US market. Gutierrez et al. (2009) show that different trading schedules between the US and Asia offer a particular market setting with various return and volatility resources; local Asian markets also play a huge role in determining each Asian ETF return. Using data from ASEAN and developed countries, Wulandari and Ariefianto (2022) found that emerging markets were influenced by developed countries in the stock market. Volatility can influence positive and negative ETF returns (Yavas & Rezayat, 2016), implying that ETFs from Brazil, Russia, India, Indonesia, Turkey, and South Africa are negatively influenced. Meanwhile, China, Mexico, and South Korea have positive returns. All the European and American countries have positive mean returns. Meanwhile, Zawadzki (2020) reached a different result that mentioned country ETFs often misprice, do not track their corresponding index well, and often have significantly negative values.

1.3. Exchange Rates

Katechos (2011) shows that exchange rates and global stock market returns are strongly linked, with higher interest rates positively affecting global equity returns, whereas lower interest rates negatively affect the returns. Considering that exchange rates influence business profitability since future cash flows will change, when volatility occurs, it certainly will affect the listed companies' stock prices. Fluctuation of exchange rates plays an essential role in decision-making to take any investment opportunities; fluctuating foreign exchange usually leads to risky investment movements. Using data from the Malaysian equity market, Ibrahim and Aziz (2003) show that exchange rates are negatively associated with stock prices. Kamran Khan (2019) found that the exchange rate has a significant negative influence on the stock returns of the Shenzhen Stock Exchange.

There is limited literature that shows the relationship between ETF returns and exchange rates. Previous studies show valuable findings using data from commodity and currency-hedged ETFs. Using data

from commodity ETFs, Rompotis (2016) shows that currency index considers the exchange rates of USD with EUR, JPY, GBP, and CNY and has a significantly positive impact on ETF performance. Using data from US-listed currency-hedged ETFs with a panel VAR approach, Shank and Vianna (2016) show that investors can anticipate changes in exchange rates and use currency-hedged ETFs to anticipate such changes. Meanwhile, Geetha et al. (2020) show that ETFs are insensitive to currency rate fluctuations. Bai and Koong (2018) stated that oil prices significantly negatively impact the trade-weighted US dollar index.

Therefore, we propose the following hypothesis:

Hypothesis 1: Exchange rates negatively affect ETF returns in developed and emerging countries.

1.4. Global Return

The index is a blueprint of most ETFs with an underlying index. It is a blueprint on which an ETF is based. ETF providers can use an established index or create their own with seasoned indexers. ETFs are based on well-known indices, namely the Standard & Poor's (S&P), Dow Jones's, and MSCI. The success of an ETF is critical for replicating its underlying index (Xu & Yin, 2017). The majority of passive management of ETFs entails all of the components of the underlying index at the same weights without needing to use any complex and costly strategies to produce returns aligned with the tracking benchmark. Rompotis (2011) defines that tracking errors are significantly influenced by bid-ask spreads of equity stocks, and index funds are also obliged to maintain significant amounts of cash for redemptions, dividend policies, and transaction costs. Tracking errors of ETFs indicate differentiation between the actual returns of the ETFs and return of their underlying indices.

The global market is interconnection of various investment exchanges around the world that enable individuals and entities to trade securities at the international level. Market proxies are a broad representation of the stock market as a whole and can be used as a basis for index funds or study statistics. Theoretically, this market proxy represents the global market. Market proxies such as Standard & Poor's 500 (S&P 500), the Dow Jones Industrial Average (DJIA), and Morgan Stanley Capital International World (MSCI World) are often used to represent global returns, since the US is still leading the global financial market. Levy and Lieberman (2013) revealed a correlation between the US market and country ETF returns. Moreover, Malladi and Dheeriya (2021), by using data from Bitcoin and Ripple finds, revealed that the MSCI World Index and SP500 do not seem to affect the return of volatilities of cryptocurrencies. Limited literature studies the relationship between market returns and country ETF returns.

Therefore, this raises the question of whether the MSCI World has the same effect on country ETF returns. Given this, we hypothesize that:

Hypothesis 2: Market returns negatively affect ETF returns in developed and emerging countries.

2. Methodology

In this study, researchers used variables that were classified into three groups: the dependent variable, variable of interest, and control variable. The dependent variable in this study is ETF returns. The independent variables in this study are exchange rates and market returns. The control variable in this study is liquidity and economic policy uncertainty. This study is conducted in several steps; hence, the flowchart below depicts how this paper is written.

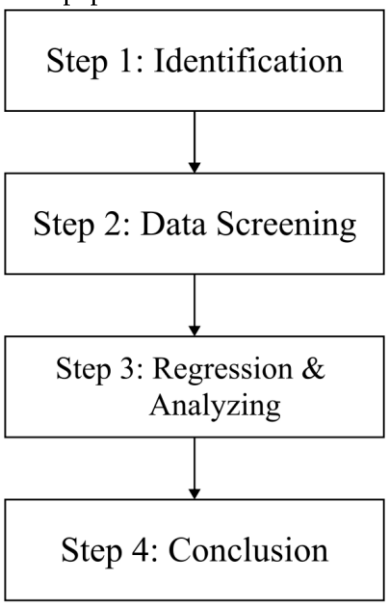

Figure 1. The research flowchart (Developed by the authors)

2.1. Sample

The data used in this study in emerging countries used 7 ETFs and 12 ETFs for developed countries. This study uses time series monthly data from January 2012 to July 2022. This period was chosen because it covers important events in the financial market, such as financial crisis, global recession, and the COVID-19 pandemic, which have a crucial impact on the economy and capital market. The number of the samples is 127 monthly data for ten years. The monthly data are chosen to guarantee acceptable quantification of the observations.

We performed screening on the iShares Blackrock website. The country ETF return data were obtained from closing prices listed on financeyahoo.com, and the exchange rate data were obtained using the BBDXY (Bloomberg Dollar Spot Index) from the Bloomberg Terminal and the MSCI Emerging Markets Currency Index from investing.com. Market returns use closing price data from the MSCI World Index obtained from investing.com. The liquidity data were obtained from the calculation of market capitalization from CapitalIQ.com, volume from financeyahoo.com, and economic policy uncertainty (EPU) from the

policyuncertainty.com website.

2.2. Dependent Variable: Country ETF Return

Miffre (2007) mentioned that iShares MSCI country funds (and other general ETFs) offer additional advantages of being tax-efficient, low tracking error, and low costs. All of these reasons explain why iShares was chosen as the backbone of this study. We use emerging country ETFs from Malaysia, Taiwan, Mexico, Brazil, China, and Latin America, seeing that these countries are among the top largest economies by GDP (gross domestic product). For developing country ETFs, we use data from Australia, Canada, Germany, Hong Kong, Japan, Switzerland, France, Singapore, the Eurozone, Europe, and the United States based on countries with the highest HDI (high development index) scores. The HDI refers to a statistical measure of an economy's level of human development.

Table 1. The country ETF list (Developed by the authors)

Region	ETF Lists	Ticker	ETF Composition	Countries' view
Developed	iShares MSCI EAFE ETF	EFA	EAFE stock (Europe, Australia, Asia, and the Far East)	Multi
	iShares MSCI Australia ETF	EWA	Australian stock	Single
	iShares MSCI Canada ETF	EWC	Canadian stock	Single
	iShares MSCI Germany ETF	EWG	Germany stock	Single
	iShares MSCI Hong Kong ETF	EWH	Hong Kong stock	Single
	iShares MSCI Japan ETF	EWJ	Japanese stock	Single
	iShares MSCI Switzerland ETF	EWL	Swiss stock	Single
	iShares MSCI France ETF	EWQ	French stock	Single
	iShares MSCI Singapore ETF	EWS	Singapore stock	Single
	iShares MSCI Eurozone ETF	EZU	Euro currency countries stock	Multi
	iShares Europe ETF	IEV	European stock	Single
	iShares Core S&P 500 ETF	IVV	S&P 500 Index (United States)	Single
Emerging	iShares MSCI Emerging Markets ETF	EEM	Emerging market stocks (China, Korea, India, Taiwan, Indonesia, United Arab Emirates, etc.)	Multi
	iShares MSCI Malaysia ETF	EWM	Malaysian stock	Single
	iShares MSCI Taiwan ETF	EWT	Taiwanese stock	Single
	iShares MSCI Mexico ETF	EWW	Mexican stock	Single
	iShares MSCI Brazil ETF	FWZ	Brazilian stock	Single
	iShares China Large-Cap ETF	FXI	Chinese stock	Single
	iShares Latin America 40 ETF	ILF	Latin American stock	Single

2.3. Independent Variables: Exchange Rates and Global Returns

Bloomberg, as one of the largest financial institutions, managed its index, the Bloomberg Dollar Spot Index (BBDXY). We use the BBDXY to measure exchange rates associated with ETF returns. The BBDXY measures the volatility of a foreign currency against the US dollar. The main reason for using the BBDXY is that the US Dollar Index (DXY) only focuses on currencies from leading global countries, as mentioned by Cheng et al. (2020); meanwhile, the BBDXY is more diversified by providing developed and emerging market currencies such as (Indian rupee, Korean won, Mexican peso, and Chinese renminbi) as the major currencies as trading partners of the US.

Exchange rate variables from emerging countries are analyzed using data from the MSCI Emerging Markets 100% Hedged to USD Index (USD), which represents a close estimation of the performance as a hedged index using currencies from Brazil, Chile, China, Colombia, Czech Republic, Egypt, Greece, Hungary, India, Indonesia, Korea, Kuwait, Malaysia, Mexico, Peru, Philippines, Poland, Qatar, Saudi Arabia, South Africa, Taiwan, Thailand, Turkey, and the United Arab Emirates. The MSCI Emerging Markets Index represents equities and assets, while the JP Morgan Emerging Local Markets Index represents short-term local currency indices. Ladekarl and Peters (2013)

mentioned that this benchmark is a broad, market-cap-weighted representation of the most liquid segment within each asset class, and the set of countries included has many varieties. Considering that the country ETF data that we study are equity-based ETFs, we chose the MSCI Emerging Market Index as a proxy for the emerging market exchange rate.

Market capitalization weighted using the weight of an equity in the index is equal to the market cap of the equity divided by the total market cap of all the equities listed in the index. Neukirch (2008) mentioned that the MSCI World significantly outperformed the equal weighting approaches compared with the cap-weighted index for country or sector effects.

2.4. Control Variables: Liquidity and EPU

Bae and Kim (2020) show that liquidity is an important risk that influences ETF returns, which is identical to general stock; liquidity is an important aspect to consider when investors make an investment decision in ETFs. The effect of market liquidity focuses on widely accepted proxies such as trading volume and bid-ask spread. In research on German ETFs, Osterhoff and Kaserer (2016) stated that liquidity affects tracking errors in portfolio adjustment, implying that liquidity costs play a significant role in various events that trigger a market transaction. Marshall et al. (2015) stated that ETF liquidity is influenced by and influences the liquidity of the underlying stock, and liquidity risk is priced in the ETF returns.

The EPU index developed by Baker et al. (2016) is used based on newspaper coverage frequency using articles from leading US newspapers that contain words such as "economic" or "economy," "uncertain" or "uncertainty," "congress," "deficit," "Federal Reserve," "legislation," "regulation," or "White House." EPU indices are helpful in measuring uncertainty for countries with fewer options. Uncertainty from news, policy, market, and economic indicators can be measured using the EPU index (Al-Thaqeb & Algharabali, 2019). Using global stock returns from 16 countries, Phan et al. (2018) examined the role of EPU in predicting stock excess returns. Major evidence suggests that EPU has a negative influence on stock returns. EPU is defined as an uncertainty index regarding regulatory, fiscal, or monetary policy. Financial and economic fundamentals are also influenced by EPU.

Chen et al. (2017a), using time series data of Chinese stock market expected returns, showed that EPU negatively predicts the future stock market. These findings are consistent with behavioral asset pricing models that have a high level of uncertainty, coincidental behavioral biases, and speculative mispricing under short-sales constraints.

Table 2. The variable list and proxies (Developed by the authors)

Variables	**Proxy**	**Expected Sign (Hypotheses)**	**Source**
ETF Return in Developed and Emerging Countries	$R_{i,t} = Ln(P_{i,t}/P_{i,t}\text{-}1)$ $R_{i,t}$ = ETF return $P_{i,t}$ = prices at times t $P_{i,t}$-1 = prices at times t-1 (Wong & Shum, 2010)	Negative	Yahoo Finance
Bloomberg Dollar Spot Index (BBDXY) MSCI Emerging Markets Currency Index (EMI) MSCI World Index (MSWO)	$R_t = \frac{P_t - P_{t-1}}{P_{t-1}}$ x 100% R_t = simple return at time *t* $P_t = prices\ at\ time\ t$ P_{t-1}= prices at time $t-1$ (Brooks, 2019)	Negative	Bloomberg, Yahoo Finance, Investing.com Yahoo Finance, Investing.com
Liquidity (LIQ)	$w_i^M = \frac{Q_i P_i}{\sum_{j=1}^{N} Q_j P_j} * \underset{\text{each ETF}}{\text{volume}}$ w_i - fraction of the portfolio allocated to security i or weight of security i Q_i - number of shares outstanding of security i P_i - share price of security i N - number of securities in the index (CFA Institute, 2022)	Positive	Yahoo Finance, Capital IQ
EPU (Economic Policy Uncertainty)	Policy Uncertainty (2022)	Negative	Policy Uncertainty

An error correction model (ECM) is a time series regression method that is used to analyze long- and short-term relationships in research variables where the basic variable has a long-term stochastic trend called co-integration. The co-integration test must be performed before the ECM regression, and all the variables must be satisfied. ECM is formed using the residuals from the long-term equations, and these

residuals are used as the error correction term (ECT), which influences the short-term equations. The ECM model is said to be valid if the co-integrated variables are supported by negative coefficient values that theoretically must range between -1 and 0. If they exceed this range, the results will not make sense.

We also use percentage change regression because its model would be the best for modeling percentage changes directly such as prices and would be the simplest way to reduce the magnitudes of all regression coefficients. However, we find that the model has heteroskedasticity and autocorrelation problems; therefore, we use a robustness test to check. Following Müller (2014), we can use the Newey and West (1987) regression to treat the problems of heteroscedasticity and autocorrelation (HAC).

3. Results

3.1. Descriptive Statistics

Table 3 provides the descriptive statistics results explaining the summary of the study variables in the form of the average, standard deviation, kurtosis, range, minimum, maximum, percentiles 1% and 99%, and count (observations).

Table 3. Descriptive statistics (Developed by the authors)

Variable	Mean	Median	Max	Min	Std. Dev	Percentile 1%	Percentile 99%	Obs
EFA	-0.002	-0.009	0.152	-0.133	0.041	-0.075	0.188	127
EWA	-0.000	-0.008	0.258	-0.139	0.056	-0.111	0.151	127
EWC	-0.002	-0.002	0.233	-0.134	0.048	-0.121	0.116	127
EWG	-0.001	-0.012	0.199	-0.150	0.055	-0.104	0.172	127
EWH	-0.002	-0.003	0.142	-0.101	0.048	-0.091	0.141	127
EWJ	-0.003	-0.006	0.093	-0.100	0.039	-0.922	0.091	127
EWL	-0.005	-0.010	0.109	-0.088	0.038	-0.684	0.092	127
EWQ	-0.003	-0.118	0.210	-0.197	0.051	-0.088	0.133	127
EWS	0.001	0.000	0.229	-0.159	0.052	-0.133	0.129	127
EZU	-0.002	-0.009	0.206	-0.179	0.052	-0.084	0.140	127
IEV	-0.002	-0.006	0.167	-0.150	0.046	-0.750	0.125	127
IVV	-0.009	-0.015	0.135	-0.119	0.040	-0.103	0.099	127
BBDXY	0.002	0.001	0.048	-0.037	0.351	-0.033	0.046	127
MSWO	0.007	0.012	0.126	-0.134	0.263	-0.089	0.108	127
LIQ	-0.017	0.011	0.654	-2.601	0.016	-0.820	0.635	127
EPU	0.000	0.014	0.812	-1.198	0.040	-0.741	0.505	127
EEM	-0.000	-0.004	0.171	-0.121	0.047	-0.104	0.133	127
EWM	0.006	0.004	0.314	-0.129	0.051	-0.089	0.175	127
EWT	-0.006	-0.009	0.129	-0.116	0.047	-0.103	0.126	127
EWW	0.001	-0.008	0.383	-0.171	0.067	-0.120	0.196	127
EWZ	0.005	0.006	0.487	-0.249	0.100	-0.213	0.252	127
FXI	0.001	-0.007	0.133	-0.145	0.058	-0.131	0.130	127
ILF	0.004	0.004	0.426	-0.223	0.082	-0.187	0.232	127
EMI	0.000	0.000	0.051	-0.047	0.016	-0.035	0.039	127
MSWO	0.007	0.012	0.126	-0.134	0.040	-0.089	0.108	127
LIQ	-0.039	0.002	0.765	-5.301	0.533	-0.562	0.719	127
EPU	0.000	0.014	0.812	-1.198	0.263	-0.741	0.505	127

Table 3 shows that in developed countries, the average returns on ETFs range from -0.005 to 0.001, with standard deviations ranging from 0.039 to 0.056. The liquidity variable itself has an average of -0.017 and a standard deviation of 0.351, and the EPU variable has an average of 0.000 and a standard deviation of 0.263. The BBDXY variable has an average of 0.003 and a standard deviation of 0.016. The MSWO has an average of 0.007 with a standard deviation of 0.040. EFA (Europe, Australia, Asia, and the Far East), Australia, Canada, Germany, Hong Kong, Japan, Switzerland, the Eurozone, Europe, and the United States have negative average returns, while Singapore is the only country with a positive average return.

In emerging countries, average returns on ETFs range from -0.006 to 0.005, with standard deviations ranging from 0.047 to 0.100. The liquidity variable has an average of -0.039 and a standard deviation of 0.533. EPU and EMI have an average of 0.000 with standard deviations of 0.263 and 0.016. The MSWO has an average of 0.007 and a standard deviation of 0.040. ETFs in emerging countries and Taiwan have negative average returns, while Malaysia, Mexico, Brazil, China, and Latin America have positive average returns.

We can see volatility with standard deviation. Australia has the highest volatility (0.056) among the developed countries, followed by Germany (0.055), Singapore and the Eurozone (0.052), and France (0.051), while Switzerland has the lowest volatility (0.038). Brazil exhibits the highest volatility (0.100) shown by standard deviation, followed by Latin America (0.082) and Mexico (0.067), while the emerging countries' and Malaysia's ETFs have the lowest standard deviation (0.047). These findings agree with research conducted by Yavas and Rezayat (2016), which explains that emerging countries have higher volatility than developed countries.

3.2. Correlation Results

Tables 4 and 5 show Pearson's correlations for all variables used in the study, including the dependent variable, variable of interest, and control variables. The results of this test aim to determine the strength of the linear relationship between two variables. We use pairwise correlation because it displays all correlations.

Table 4. The Pearson correlation matrix for the developed countries (Developed by the authors)

	EFA	EWA	EWC	EWG	EWH	EWJ	EWL	EWQ	EWS	EZU	IEV	IVV	BBDXY	MSWO	LIQ	EPU
EFA	1.000															
EWA	0.827	1.000														
EWC	0.824	0.812	1.000													
EWG	0.934	0.694	0.760	1.000												
EWH	0.732	0.660	0.616	0.667	1.000											
EWJ	0.821	0.644	0.575	0.704	0.568	1.000										
EWL	0.880	0.716	0.686	0.821	0.591	0.638	1.000									
EWQ	0.950	0.724	0.786	0.931	0.661	0.687	0.828	1.000								
EWS	0.793	0.759	0.751	0.709	0.792	0.631	0.620	0.728	1.000							
EZU	0.962	0.734	0.792	0.963	0.067	0.707	0.843	0.982	0.735	1.000						
IEV	0.980	0.769	0.818	0.949	0.695	0.713	0.894	0.975	0.750	0.983	1.000					
IVV	0.854	0.752	0.820	0.800	0.582	0.696	0.791	0.791	0.699	0.803	0.830	1.000				
BBDXY	0.024	0.022	-0.000	0.036	0.105	-0.024	0.025	0.023	0.015	0.014	0.018	-0.053	1.000			
MSWO	-0.932	-0.811	-0.856	-0.870	-0.658	-0.762	-0.852	-0.870	-0.765	-0.884	-0.909	-0.973	0.026	1.000		
LIQ	-0.275	-0.205	-0.311	-0.203	-0.188	-0.195	-0.210	-0.263	-0.127	-0.253	-0.267	-0.322	-0.047	0.311	1.000	
EPU	-0.293	-0.243	-0.248	-0.308	-0.236	-0.229	-0.172	-0.308	-0.219	-0.300	-0.282	-0.229	-0.271	0.234	0.2638	1.000

Table 5. The Pearson correlation matrix for the emerging countries (Developed by the authors)

	EEM	EWM	EWT	EWW	EWZ	FXI	ILF	EMI	MSWO	LIQ	EPU
EEM	1.000										
EWM	0.630	1.000									
EWT	0.825	0.555	1.000								
EWW	0.675	0.569	0.569	1.000							
EWZ	0.738	0.564	0.556	0.649	1.000						
FXI	0.781	0.369	0.545	0.311	0.415	1.000					
ILF	0.775	0.598	0.605	0.766	0.972	0.429	1.000				
EMI	-0.858	-0.602	-0.657	-0.613	-0.747	-0.612	-0.757	1.000			
MSWO	-0.758	-0.514	-0.706	-0.674	-0.562	-0.460	-0.633	0.608	1.000		
LIQ	0.002	-0.010	-0.022	-0.007	0.004	0.013	-0.017	-0.085	0.086	1.000	
EPU	-0.231	-0.186	-0.231	-0.254	-0.150	-0.131	-0.0175	0.148	0.234	0.067	1.000

For developed countries, almost all ETFs have a negative coefficient on the exchange rate, global market, liquidity, and EPU. The global market with the MSWO proxy has the highest correlation value among the other variables with a range of -0.658 to -0.973. The other variables do not have enough correlation with ETFs. Meanwhile, the positive correlation between one ETF and another is quite high, ranging from 0.616 to 0.982.

For emerging countries, almost all ETFs have a negative coefficient on the exchange rate, global market, liquidity, and EPU. Exchange rates (EMI) and the global market (MSWO) have a moderate to high negative correlation with ETFs. In addition, most ETFs have a high correlation with other ETFs, although there are some that have a low correlation.

3.3. Regression Results

Previously, we performed co-integration and ECM tests on this dataset. Even though the variables satisfied the co-integration results, most ETFs have ECT (error correction terms) absolute results > 1, which is explosive, so it violates the ECM requirements. Therefore, we use percentage change regression to prove the empirical results of this study.

Tables 6 and 7 show percentage change regression with the Newey-West standard errors to overcome the heteroscedasticity problem. We agree with Chen et al. (2017b) that the US is the largest ETF market in the world, innovation and knowledge have become leading for ETFs globally. Our finding on exchange rates and the global market return as determinants of country ETF returns should be of interest to retail investors, global funds, and policymakers. The global market return result shows highly negative influences on all developed and emerging country ETFs except FXI in China. This result is supported by Levy and Lieberman (2013), who mentioned market return with S&P 500 as proxy being the largest part of country ETF return; however, their result is inconsistent with that by Lee et al. (2016) who found that Asian country ETFs (Hong Kong, Japan, Malaysia, Singapore, Taiwan, and South Korea) is significantly positive at the conventional level. Using the BRICS countries (Brazil, Russia, India, China, and South Africa), stock markets have more influence on exchange rates during both calm and turbulent periods (Chkili & Nguyen, 2014). Using Europe and emerging countries, Yavas and Dedi (2016) stated that emerging markets (Turkey, Russia, and Poland) are more volatile than developed markets (Germany and Austria). Huang and Lin (2011) stated that emerging market ETFs have higher Sharpe measures than those used for measuring risk-adjusted relative returns.

Table 6. OLS regression for the developed countries with the Newey-West standard errors

Variable	EFA	EWA	EWC	EWG	EWH	EWJ	EWL	EWQ	EWS	EZU	IEV	IVV
BBDXY	0.073	0.106	0.025	0.105	0.317	-0.050	0.145	0.054	0.085	0.038	0.068	-0.073
	(0.092)	(0.147)	(0.158)	(0.162)	(0.211)	(0.149)	(0.111)	(0.155)	(0.186)	(0.153)	(0.122)	(0.055)
MSWO	-0.964***	-1.157***	-1.019***	-1.211***	-0.798***	-0.760***	-0.850***	-1.110***	-1.043***	-1.147***	-1.038***	-0.973***
	(0.035)	(0.075)	(0.060)	(0.053)	(0.095)	(0.057)	(0.055)	(0.063)	(0.804)	(0.056)	(0.047)	(0.028)
LIQ	0.004	0.010*	-0.005	0.016***	0.005	0.006	0.006	0.004	0.020**	0.007	0.004	-0.002
	(0.002)	(0.006)	(0.006)	(0.005)	(0.009)	(0.004)	(0.006)	(0.005)	(0.009)	(0.005)	(0.004)	(0.001)
EPU	-0.012**	-0.013	-0.007	-0.025***	-0.011	-0.010	0.005	-0.022**	-0.012	-0.020**	-0.012*	-0.000
	(0.005)	(0.015)	(0.012)	(0.008)	(0.009)	(0.010)	(0.007)	(0.010)	(0.015)	(0.009)	(0.007)	(0.003)
Constant	0.004***	0.008**	0.005**	0.007***	0.002	0.002	0.001	0.004**	0.009***	0.006***	0.005***	-0.002**
	(0.001)	(0.003)	(0.002)	(0.002)	(0.003)	(0.002)	(0.001)	(0.002)	(0.002)	(0.002)	(0.001)	(0.000)
F-Stat	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000

Statistical significance is denoted as * at the 10% level, ** at the 5% level, and *** at the 1% level

Table 7. OLS regression for the emerging countries with the Newey-West standard errors

Variable	EEM	EWM	EWT	EWW	EWZ	FXI	ILF
EMI	-1.865***	-1.478***	-1.085***	-1.333***	-4.070***	-1.918***	-3.080***
	(0.124)	(0.252)	(0.231)	(0.329)	(0.415)	(0.344)	(0.296)
MSWO	-0.425***	-0.273***	-0.561***	-0.768***	-0.401**	-0.190	-0.532***
	(0.059)	(0.100)	(0.092)	(0.163)	(0.268)	(0.177)	(0.199)
LIQ	-0.001	-0.002	-0.000	0.001	-0.006	-0.002	-0.007
	(0.003)	(0.002)	(0.003)	(0.004)	(0.005)	(0.006)	(0.004)
EPU	-0.009	-0.012	-0.121	-0.025	-0.005	-0.004	-0.007
	(0.007)	(0.011)	(0.009)	(0.029)	(0.038)	(0.017)	(0.031)
Constant	0.003**	0.009**	-0.001	0.007*	0.010	0.003	0.009*
	(0.001)	(0.002)	(0.002)	(0.004)	(0.006)	(0.004)	(0.005)
F-Stat	0.000	0.000	0.000	0.000	0.000	0.000	0.000

Statistical significance is denoted as * at the 10% level, ** at the 5% level, and *** at the 1% level

Exchange rate does not affect all developed country ETFs; this hypothesis is supported by Shin and Soydemir (2010), who found that exchange rate affects only five out of 26 ETFs used in the study. Ehrmann et al. (2011) stated that exchange rates are important for the US and euro bond yields, and in the equity market, there is no significant effect found. On the other hand, the exchange rate shows very highly negative significance to emerging ETFs. This result is inconsistent with that by Rompotis (2016) who mentioned that the exchange rate is positive and strongly significant with ETF performance. Using data from the Shenzhen Stock Exchange, Kamran Khan (2019) also stated that exchange rates have a significant negative influence on stock returns. Bai and Koong (2018) revealed a negative effect of oil prices on the trade-weighted US dollar index, using data from China and the US. Using data from the Taiwan stock market Singh et al. (2011) found that exchange rates and GDP have substantial effects on the companies listed in the Taiwan 50 Index. Using Islamic ETF returns and strategic commodities such as oil and gold prices, Farouk and Masih (2017) argues that Islamic ETF price has a positive influence on the exchange rate of the Malaysian ringgit (MYR)-the US dollar (USD). For the Mexican and Brazilian stock markets, Bernal-Ponce et al. (2020) found empirical evidence that spot exchange rate and futures market effects are both negative. Santillán-Salgado et al. (2019) also supported with evidence from Latin America that the exchange rate has a negative and highly significant influence on the stock market.

Meanwhile, liquidity and EPU as control variables show a negative influence on minor developed country ETFs. Chen et al. (2017a) stated that EPU predicts negatively in the Chinese stock market. This result is not in line with that by Phan et al. (2018) who found that EPU has an important effect on stock performance. Our result is consistent with that by Zawadzki (2020), who showed that emerging country ETFs often experience mispricing for several reasons, such as lower liquidity than that in the US market and other developed countries, and different trading times can have an impact on ETF markets in emerging countries.

4. Discussion

This study investigates the effects of exchange rates and the global market on a selected country's exchange-traded fund (ETF) return. The dataset is constructed from 12 developed countries' ETFs and seven emerging countries' ETFs with monthly frequency for January 2012-July 2022. We employed linear regression with the delta percentage change method. The empirical analysis suggests that there are highly significant negative co-movements between the global market and the majority of the selected country ETF returns. Meanwhile, exchange rates highly significantly and negatively influence only emerging market ETFs. We concluded that developed market ETFs have a strong negative linkage with global market returns, whereas emerging market ETFs are influenced by exchange rates and the global market. FXI in China is the sole ETF that does not receive any influence from the global market. Supporting this argument, Feng and Tu (2010) mentioned that the influence of co-movement between the Chinese stock and international market is still limited.

Our innovation consists of comparing different country ETFs in a single study previously conducted by da Costa Neto et al. (2019) to examine differences between developed and developing countries' ETFs. In addition, we use macroeconomics as dependent variables, such as the exchange rate and global market. We also use global market proxies that were rarely used before, such as the MSCI World, and exchange rates with the BBDXY and MSCI EM Currency Index.

Our empirical findings show a strong correlation between the selected ETFs in developed and emerging countries and a negative co-movement between the global market returns and major country ETFs. Exchange rates only show a highly significant negative effect on emerging country ETFs.

5. Conclusion

Therefore, we conclude that macroeconomic conditions such as exchange rates are negatively linked with emerging countries' ETFs because of the lower exchange rates than those in developed countries. Meanwhile, a mature market such as a developed market shows no significancy. It is expected because of stable population and slowing economic growth; GDP also reached advanced stage of the development.

These results also provide valuable implications for the ETF industry, especially in emerging markets, by stimulating and encouraging investors to access more diverse investment vehicles and contributing to capital market development and securities liquidity. When emerging ETFs continue to grow, they may become widely known investment vehicles and impact both domestic and global financial markets.

6. Limitations and Further Study

The limitation of this study is that it did not have completed data because of the limited resources. Future research is expected to enhance this study by using other macroeconomic variables.

Authors' Contributions

The first author is responsible for data collection, data analysis, and writing. The second author is responsible for supervising the first author and contributing to the revision of the study.

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