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Evaluating the Returns of Emerging Market Mutual Funds

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Evaluating the Returns of Emerging Market Mutual Funds

An honors thesis presented to the
Department of Business,
University at Albany, State University of New York
In partial fulfillment of the requirements
For graduation with Honors in Finance
and
graduation from the Honors College

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Research Advisor: David M. Smith

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Abstract

In this paper, the returns of mutual funds invested in emerging markets and the returns of emerging market ETFs are measured. The rates of returns of 133 emerging market mutual funds are taken from the PSN network and the return, risk, and diversification are evaluated for the emerging market mutual funds. The findings are that Southeast Asian countries dominate the proportion of investments for emerging markets. Of the countries invested in, China is the primary country invested in by a large margin. The highest rate of returns was for funds who had invested in India primarily followed by Taiwan and then followed by China. Emerging market mutual funds performed worse than large cap S&P 500 funds and had more risk than these funds, suggesting that domestic markets may be a better investment. The 9 emerging market mutual funds that invested in only one country outperformed the other 124 emerging market mutual funds that diversified.

Acknowledgements

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Evaluating the Returns of Emerging Market Mutual Funds

Introduction

Emerging market investing is becoming more popular for investors due to the potential for high returns and for diversification purposes. Even though some emerging markets have been around for 20 years there are still questions being asked as to which emerging markets individuals should invest in. Investors may be asking whether to invest in the traditional Latin America emerging markets or the newer Asian emerging markets or both. This study examines which emerging markets investors and funds should invest in as well as which diversification strategies work the best for emerging market investing.

The biggest emerging markets regarding GDP are Brazil, China, India, and Russia. Emerging markets are a large part of the world economy with a population of almost 6 billion people and with a global GDP share of 45 percent. Funds and individual investors may invest in these emerging markets because they are the largest and therefore will generate the greatest returns, but this is not always the case.

Over the past ten years several emerging markets have outperformed these larger four emerging markets. This study is an attempt to see which emerging markets generate the highest rates of return as well as to see how to diversify an emerging market investment portfolio to maximize returns. There are 133 U.S. funds in this study that are taken from the PSN Enterprise dataset. The factors extracted from this dataset include rate of returns, the emerging markets invested in, and the percentage of the fund's portfolio that are invested in each emerging market over a ten-year average period.

The findings show that Southeast Asia consists of the countries that funds are currently investing in. Of the 133 countries invested in primarily by these funds 130 of them had a Southeast Asian country as their primary country of investment. China was the most common country that was the largest holding for 107 funds followed by India at 11. Having India as the largest holding for funds resulted in the highest rate of returns for the funds while having Brazil as the largest holding in their portfolios resulted in a -1.8 percent return.

When looking at a fund's diversification and their rate of return it was found that those countries with larger holdings in one country outperformed many countries who invested in several countries. There is a correlation between a fund's diversification and their rate of return in which for every 8.06 percent increase in the primary country there is a 1 percent increase in rate of return for that fund.

I. Literature Review

Emerging Market Investing and Performance

International investment has been growing for the past couple years, especially in that of emerging markets but how do firms and investors decide which of these countries to directly invest in. Calvo (1993) and Chuhan (1998) support the claim that emerging market domestic factors including credit ratings and global factors impact capital inflows by financial firms. On the other hand, Forbes and Warnock (2012) present that the primary reason for these capital inflows by firms into emerging markets being a result of global risk and not domestic factors.

Bianchi, Galstyan, and Herzberg (2020) have data to support Forbes and Warnock (2012) in which a global spike in risk impacts countries with stronger fundamentals than those with weaker fundamentals. Bianchi et al analyze the credit ratings, sovereign ratings, and

geographical distance of emerging markets of Irish investment funds. Irish investment funds global risk perception covaries negatively with sovereign credit rating for emerging markets and the Irish investors tend to invest less in countries that are closer to the country where investing takes place. This explains the over 35% of Irish funds' equity exposure to the greater China emerging markets followed by South Korea 16% and India 14% which are the other dominating emerging markets.

Investors have started to invest overseas in emerging markets for profits as well as for diversification purposes. Solnik and McLeavey (2009) find that it is sometimes difficult for investors to invest in these emerging markets since these emerging markets impose heavy restrictions on investors due to the belief that domestic investment will be impacted. These restrictions are hurting the development of certain emerging markets. Chan-Lau (2005) shows that local markets in emerging market countries cannot provide financial assistance like that of foreign investors. For example, the pension funds in Sri Lanka, Pakistan, Indonesia, and Egypt do not allow international investment while the emerging markets of Turkey and Israel have no restrictions on international investments.

Kumar and Pfau (2011) evaluate what would happen in the portfolios of twenty-five emerging market pension funds if these pension funds invested in other international markets. Using data on inflation, exchange rates, local and world stock prices, world bonds, and bank deposits for each country from the International Monetary Fund's International Financial Statistics for all twenty-five countries, Kumar and Pfau (2011) create an optimal portfolio pension allocation of 55.6% in world assets and 29.6% in stocks.

Out of the twenty-five emerging market countries the authors state that twenty-two out of the twenty-five countries could benefit from international diversification in their pension funds

when international assets are included. The data suggests that emerging market pension funds should be diversifying their portfolio internationally to not only improve diversification but to increase returns by taking advantage of these growing emerging markets.

Emerging markets are growing and due to this local emerging market firms are being exposed to foreign investors who are often unfamiliar with foreign processes. Foreign investors are either viewed as only focusing on short term gains and disregarding long-term plans for these emerging markets (OECD 2015) or can be viewed unlike domestic investors as willing to pay more attention to a foreign firm's government issues (Ferreire and Matos 2008). Foreign investors from more developed countries tend to promote better corporate governance practices to other emerging countries, are less likely to succumb to political pressure, and overall are monitors of emerging markets (Aggarwal et al 2011).

Pan, Mao, and Liang (2022) observe the effect of foreign investor ownership on corporate real activities manipulation in emerging markets specifically China. Their findings suggest that emerging markets, not only China, should reduce restrictions on foreign investors because these foreign investors improve corporate governance and the market environment.

Emerging Market ETF's

Exchange traded funds can be used to help track the performance of emerging market indices and are great tools for investors who want to invest in an emerging market index Lettau and Madhavan (2018). Atilgan, Demirtas, Gunaydin, and Oztekin (2022) understand this and want to determine the correlation between these ETF returns and indices. Ever since the 1990s ETFs have been extremely popular due to passive investing and providing more information to investors about emerging market ETFs can help influence decision making among investors French (2008) and Stambaugh (2014).

Atilgan et al. view 18 emerging market ETFs that are traded on the New York Stock Exchange from 2000 to 2019 and their findings indicate that 15 out of 18 emerging market ETFs have a significant predictive relation one day ahead of the performance of the emerging market index return. This relationship for predictive relation one day ahead for emerging markets is stronger when market volatility is higher. When analyzing returns for these emerging market ETFs Atilgan et al. find that China has the highest mean at 13 basis points.

The authors find that if an emerging market ETF increases by 1% then the same country's emerging market index would increase by 20 basis points one day later which indicates the significant predictive relation one day ahead for these emerging markets. The biggest daily change in index returns is found for Russia at -19.05% and 17.66%. The lowest daily returns have been for Russia and South Africa at below 20% and the largest daily returns have been for Brazil at a little over 20%.

It is not only important to focus on the returns of emerging market ETFs and indices but also returns and volatility of these benchmarks during daytime and nighttime trading hours. Rompotis (2015) benchmarks these emerging market ETFs to corresponding benchmarks including US benchmarks to examine if the United States market time difference can influence performance on these emerging market ETFs. Rompotis observes among 40 U.S. iShares ETFs managed by BlackRock that there are deviations between net asset values of the emerging market ETFs and monthly trading prices for these emerging market ETFs.

A price regression analysis by Rompotis finds that the emerging market ETFs trade at a premium to their NAV. When comparing these emerging market indexes to that of the US there is a correlation of .411 on average. The highest correlation is with that of the Americas at .651 whereas the lowest correlation with the US market is with Asia at a correlation of .327. Pontiff

(1997) backs Rompotis' findings in which closed end funds report differences of 64% when comparing their monthly trading prices to their NAV prices.

Regarding the performance of emerging market ETF's Shin and Soydemir (2010) find iShares Asian ETFs perform a little worse than European ETFs and a lot worse than the Americas indexes. Rompotis (2015) uses a two-factor model to evaluate performance of ETFs to the U.S. benchmarks and determines that these emerging market ETFs underperform their corresponding benchmarks, and the daytime returns of these iShares are significantly less than the overnight returns.

II. Hypothesis

Emerging Market Returns:

H₁: Funds that invest across emerging markets perform better than funds that invest in domestic markets.

H₁Null: Funds that invest in domestic markets perform better than funds that invest in emerging markets.

Emerging Market Risks:

H₂: Emerging market mutual fund returns have more risk than domestic funds.

H₂Null: Domestic funds have more risk than emerging market mutual funds.

Diversification of Emerging Market Investment:

H₃: Funds that are more diversified in emerging markets will perform better than those funds in emerging markets that are focused on one or two countries.

H₃Null: Emerging market mutual funds that are focused on one country or two countries will perform better than those funds that are focused on diversification.

The diversification hypothesis stems from Kumar and Pfau (2011) who created an optimal portfolio diversification allocation for international assets. Most portfolios will benefit from diversification in emerging markets to not only hedge risk but to increase returns by taking advantage of these growing emerging markets. The investment breakdown of the funds by country percentages is compared to the rate of returns of these funds to determine if diversification outperforms focused emerging market investing.

III. Data and Methodology

Data

The fund data used for the emerging market diversification breakdown was taken from the PSN Enterprise database. There were over 500 emerging market investment funds but after removing the dissolved or terminated funds there were approximately 205 emerging market mutual funds left. Among the active funds those who had investments of ten percent or more in developed markets were also eliminated from the search after viewing the diversification breakdown of these funds because this study focus is on emerging markets and this extra investment in developed or frontier markets may skew data.

The rates of returns for all the funds for the past ten years were taken from the PSN Enterprise database. To have a reliable set of data that corresponds to newer emerging markets in Southern Asia such as China and India the ten-year rate of returns was used for these funds. After eliminating funds that did not have ten years' worth of returns there were only 133 funds that were evaluated. The top seven emerging market countries and the geographic regions that these funds invested in as well as their percentages of the portfolio were extracted from the PSN Database.

Having this breakdown is for a diversification analysis to see which countries were in those funds that performed the best and worst. It is also to compare if having a higher allocation in one country leads to greater or lesser returns. This was done by comparing the primary, secondary, and tertiary holdings of the emerging market mutual funds to the rate of returns of these emerging market mutual funds.

Exhibit 1 shows the twenty funds that had the highest rate of returns for the past ten years and are ranked by their performance. The top three countries invested in are recorded for each fund and the percentage of each fund's investment in these countries is recorded in the country percentage columns. For example, country number one is the primary country that the emerging market mutual funds invest in, and the country one percent is the amount that these emerging market mutual funds invested in this certain country. Some of these percentages for the top three countries may not add up to 100% either because there are multiple other countries that the fund has invested in or that the fund has cash on hand.

It is worth noting that of the twenty funds above, nine of these funds are invested in only one emerging market and these nine funds are the only ones of the 133 funds that were invested in only one emerging market. This data shows that those funds that were invested in primarily one country performed better than those funds that diversified their portfolios by adding several other emerging markets. Those nine funds that were invested in only one country had rates of returns of 11.53 percent while the 124 funds that were invested in more than one emerging market had returns of only 4.57 percent.

Exhibit 1. Top 20 Funds Rate of Returns over Ten Years

| Fund Rank by Performance | Fund | 10 Yr. RET (%) | Country 1 | Country 1 % | Country 2 | Country 2 % | Country 3 | Country 3 % |
|--------------------------|--|----------------|-----------|-------------|-------------|-------------|-------------|-------------|
| 1 | Wasatch Global Investors Emerging India | 15.71 | India | 98.20 | | | | |
| 2 | Oberweis Asset Mgmt, Inc. China Opportunities | 12.95 | China | 86.60 | Taiwan | 2.78 | | |
| 3 | Power Sustainable China A-Share Core Strategy | 12.48 | China | 89.20 | | | | |
| 4 | AllianceBernstein L.P. AB China Value (A-Shares) | 12.41 | China | 98.66 | | | | |
| 5 | Columbia Threadneedle Invt N.A. Columbia India Consumer | 12.22 | India | 100.00 | | | | |
| 6 | PineBridge Investments PineBridge India Equity Strategy | 12.03 | India | 93.50 | | | | |
| 7 | Acadian Asset Management LLC Emerging Markets Small-Cap Equity | 11.12 | Taiwan | 19.23 | South Korea | 17.18 | China | 15.74 |
| 8 | Baillie Gifford Overseas Limited China Equities | 11 | China | 76.09 | Taiwan | 15.07 | | |
| 9 | Morgan Stanley Investment Management China A Equity | 10.71 | China | 96.78 | | | | |
| 10 | Aubrey Capital Management Aubrey GEM Strategy | 10.1 | China | 43.27 | India | 33.65 | Brazil | 4.59 |
| 11 | Franklin Templeton Investments Franklin India Equity | 9.89 | India | 97.30 | | | | |
| 12 | Columbia Threadneedle Invstmnts Intl CT (LGM) Indian Equity | 9.84 | India | 96.75 | | | | |
| 13 | William Blair & Company, LLC Emerging Markets Small Cap Growth | 8.82 | India | 26.27 | China | 16.03 | Taiwan | 12.30 |
| 14 | Globeflex Capital, L.P. GlobeFlex Emerging Markets Small Cap | 8.63 | Taiwan | 20.68 | South Korea | 16.47 | China | 14.38 |
| 15 | State Street Global Advisors Emerging Markets Small Cap Active | 8.6 | Taiwan | 19.01 | South Korea | 17.17 | China | 16.30 |
| 16 | EAM Investors, LLC EAM Emerging Markets Small Cap | 8.51 | Taiwan | 20.17 | India | 20.03 | South Korea | 18.23 |
| 17 | State Street Global Advisors China Equity | 8.47 | China | 98.14 | | | | |
| 18 | PGIM Quantitative Solutions LLC PGIM QS Emerging Markets Small Cap | 8.22 | Taiwan | 19.28 | China | 16.27 | South Korea | 14.33 |
| 19 | UBS Asset Management Emerging Asia Equity | 7.76 | China | 41.70 | India | 20.75 | South Korea | 14.65 |
| 20 | Segall Bryant & Hamill Emerging Markets Small Cap | 7.39 | Taiwan | 19.75 | India | 17.07 | South Korea | 16.57 |

*Data taken from 9/2012 through 9/2022

Exhibit 2. Return and Frequency of Fund's Primary Country

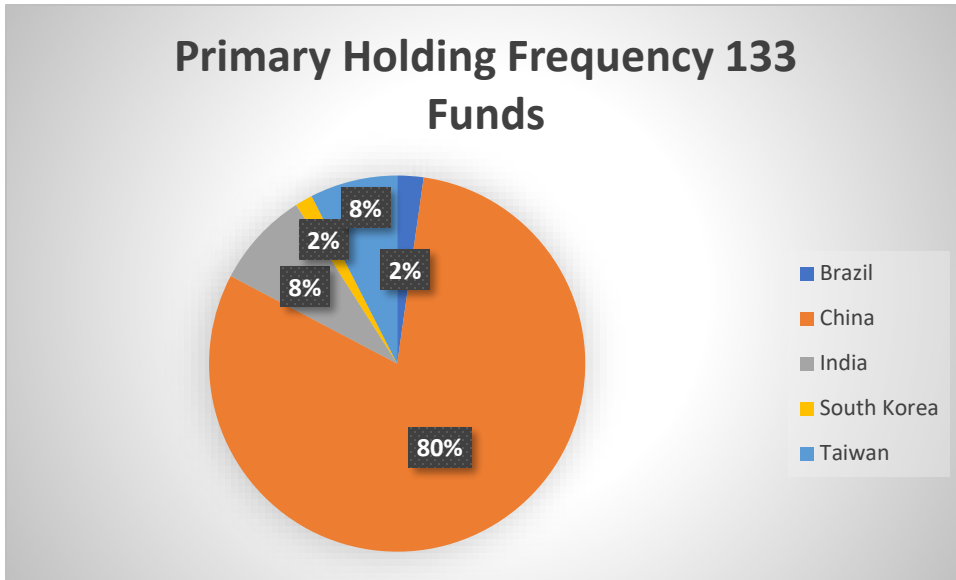
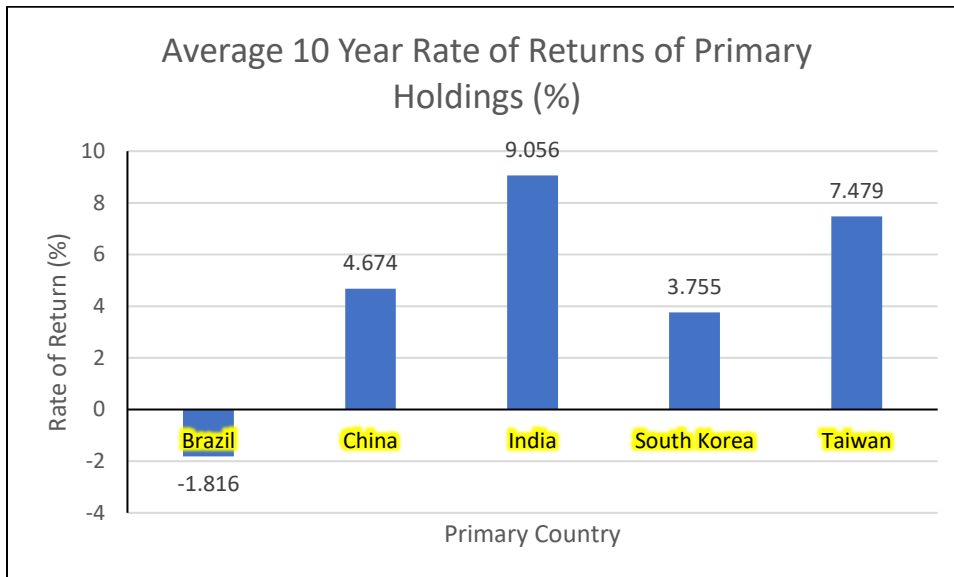


Exhibit 3. Return and Frequency of Fund's Primary Country



In Exhibit 2 individuals can see the dominance that China has regarding investment top choice by being the primary invested country 107 of the 133 times and making up around 37 percent of every fund's portfolio. Although China was the most frequent primary country (Exhibit 3) it had a below average return of 4.67 percent compared to India's return of 9.06 percent and Taiwan with a return of 7.49 percent when acting as a primary country. These returns make sense because according to Exhibit 6 the Taiwan ETF is the best performing emerging market ETF with ten-year rate of returns of 66 percent and the India ETF is right behind with ten-year rate of returns of 66.7 percent.

The only primary holding that resulted in a negative return for funds was that of Brazil which resulted in a -1.82 percent return. Many portfolios had Brazil as a top 7 holding but those who had it as their primary holding suffered. Constable (2021) states this negative rate of return could be attributed to major political problems as well as inflation issues in which the central bank of Brazil is continuing to raise interest rates. This is evident in their ETF ten-year rate of return of -45 percent (Exhibit 6).

To determine whether emerging market mutual funds outperform domestic funds the 133 emerging market mutual funds were matched up against 111 large cap S&P 500 mutual funds extracted from the PSN database. The 10-year returns on average for the emerging market mutual funds and the domestic funds are shown in Exhibit 4.

The large cap S&P mutual funds outperformed the emerging market mutual funds with a ten-year rate of return of 11.17 percent in comparison to 5.04 percent. This disproves the hypothesis that emerging market mutual funds perform better than domestic markets. Even though emerging market funds had lesser returns, they had even more risk than domestic funds (Exhibit 5). Emerging markets had higher risk for returns with a standard deviation of 45.127 in comparison

to domestic funds 29.377 standard deviation. This proves hypothesis two to be correct regarding emerging markets being riskier, but the risk does not justify the returns.

One limitation of measuring emerging market mutual funds to domestic U.S. funds is currency risk. These emerging market mutual funds deal with different countries and deal with gains and losses because of the currencies changing in value in comparison to one another.

Exhibit 4. Mutual Fund Returns

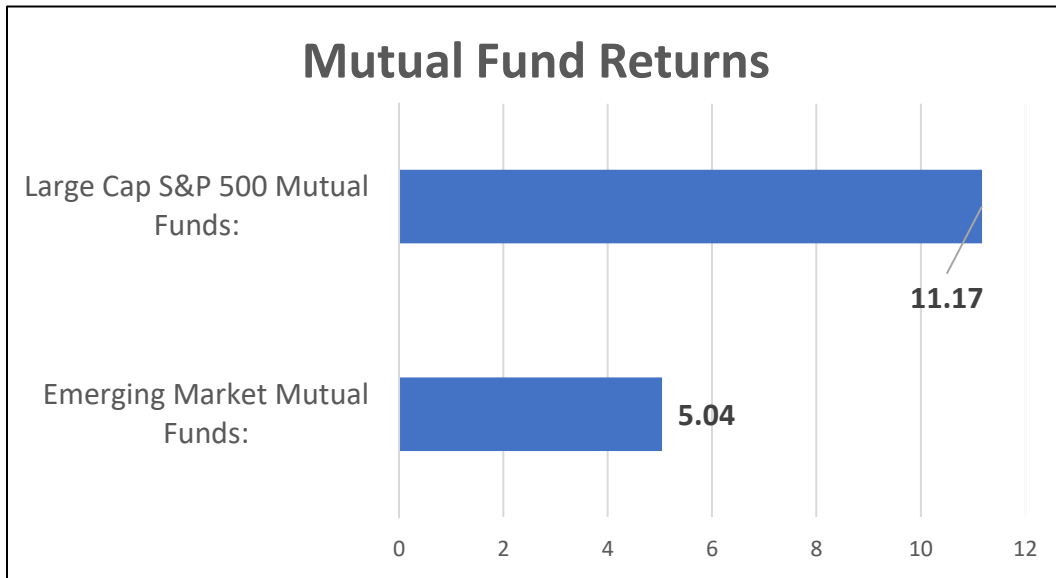
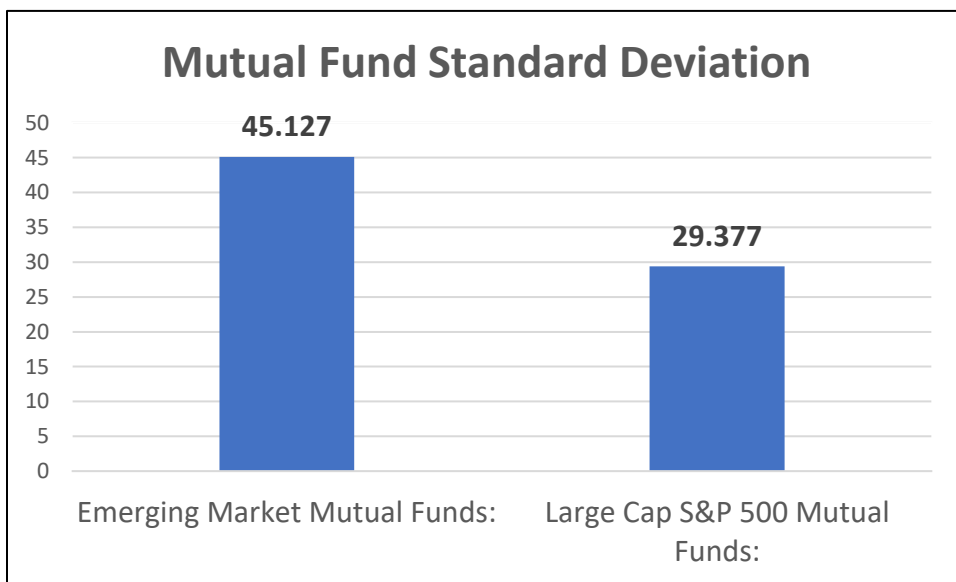


Exhibit 5. Mutual Fund Standard Deviation



To track the rate of return of these individual emerging markets and to understand why funds would invest in certain emerging markets the ten year (Exhibit 6) and all-time rate of returns of emerging market ETFs (Exhibit 7) were taken from Yahoo Finance and the iShares database. The top 19 invested emerging market countries were evaluated either in the form of an iShares MSCI ETF or a Global X MSCI ETF. These ETF returns were used as benchmarks in comparison to the fund rate of returns and to justify why the funds invested primarily in some emerging markets over others. All the values for these emerging market ETFs are valued in U.S. dollars and were extracted as of September 23rd, 2022.

Just a year ago Chinese ETF returns would be the highest with close to a 100 percent return which explains the reason why so many of these funds invested in China. China is also the second largest economy sitting right behind the US with a GDP of around 18 trillion dollars so this could be another reason why many funds choose to invest primarily in China. Although a lot of funds invested in China the ETF is only up 3.76% over ten years.

According to Appell (2022) the reason why investors have seen a decline in Chinese stock is due to regulatory and geopolitical concerns. Appell believes that India is a better investment than China because of its growth trajectory and the higher standard that the government holds. For example, Appell states that India has better transparency for financials, a better government structure, an independent central bank, and India protects the rights of shareholders which is why investors can see a switch from China to India being an emerging market leader.

Investing in India is not as risky as it seems because it is still the sixth largest country in terms of GDP with around 3.5 trillion dollars. This reasoning could be why some funds are invested primarily in India and Taiwan because of the transparency these countries are offering to

its shareholders. One thing to note in Exhibit 6 is that India and Taiwan have performed the best over the best ten years with returns of 63.7% and 66.19% respectively.

This corresponds to the exhibit 3 data in which India and Taiwan have the highest rate of returns for emerging market mutual funds when these countries act as the primary holding. It is also worth noting that some of the best investments all time (exhibit 7) such as Mexico, the MSCI ETF, and Brazil have performed poorly over the past ten years.

Exhibit 6. Emerging Market ETF Benchmark Returns 10 Years by Region

| Geographic Regions | Country | ETF | Rate of Return 10 Years |
|--------------------|--------------|---|-------------------------|
| AFRICA | South Africa | iShares MSCI South Africa ETF (EZA) | -45.18% |
| ASIA PACIFIC | ALL ASIA | iShares MSCI Emerging Markets Asia ETF (EEMA) | 10.92% |
| ASIA PACIFIC | China | iShares MSCI China ETF (MCHI) | 3.76% |
| ASIA PACIFIC | India | iShares MSCI India ETF (INDA) | 63.70% |
| ASIA PACIFIC | Indonesia | iShares MSCI Indonesia ETF (EIDO) | -19.85% |
| ASIA PACIFIC | Malaysia | iShares MSCI Malaysia ETF (EWM) | -64.12% |
| ASIA PACIFIC | Philippines | iShares MSCI Philippines ETF (EPHE) | -22.12% |
| ASIA PACIFIC | Taiwan | iShares MSCI Taiwan ETF (EWT) | 66.19% |
| ASIA PACIFIC | Thailand | iShares MSCI Thailand ETF (THD) | -11.29% |
| ASIA PACIFIC | South Korea | iShares MSCI South Korea ETF (EWY) | -15.08% |
| EUROPE | Greece | Global X MSCI Greece ETF (GREK) | -52.27% |
| EUROPE | Turkey | iShares MSCI Turkey ETF (TUR) | -58.87% |
| EUROPE | Poland | iShares MSCI Poland ETF (EPOL) | -56.32% |
| LATIN AMERICA | Argentina | Global X MSCI Argentina ETF (ARGT) | 57.99% |
| LATIN AMERICA | Brazil | iShares MSCI Brazil ETF (EWZ) | -45.07% |
| LATIN AMERICA | Chile | iShares MSCI Chile ETF (ECH) | -60.21% |
| LATIN AMERICA | Mexico | iShares MSCI Mexico ETF (EWW) | -30.60% |
| LATIN AMERICA | Peru | iShares MSCI Peru ETF (EPU) | -46.53% |
| MIDDLE EAST | Saudi Arabia | iShares MSCI Saudi Arabia ETF (KSA) | 57.99% |
| MIDDLE EAST | UAE | iShares MSCI UAE ETF (UAE) | -37.91% |
| ALL | ALL | iShares MSCI Emerging Markets ETF (EEM) | -9.71% |

*All Data is expressed in U.S. dollars as of 9/23/2022

Exhibit 7. Emerging Market ETF Benchmark All Time Returns

| Geographic Regions | Country | ETF | Time Period | Rates of Return |
|--------------------|--------------|---|-------------|-----------------|
| LATIN AMERICA | Mexico | iShares MSCI Mexico ETF (EWW) | 26 years | 332.96% |
| ALL | ALL | iShares MSCI Emerging Markets ETF (EEM) | 19 years | 237.01% |
| ASIA PACIFIC | South Korea | iShares MSCI South Korea ETF (EWY) | 22 years | 156.86% |
| AFRICA | South Africa | iShares MSCI South Africa ETF (EZA) | 19 years | 87.26% |
| LATIN AMERICA | Brazil | iShares MSCI Brazil ETF (EWZ) | 22 years | 62.86% |
| MIDDLE EAST | Saudi Arabia | iShares MSCI Saudi Arabia ETF (KSA) | 7 years | 57.99% |
| ASIA PACIFIC | India | iShares MSCI India ETF (INDA) | 10 years | 55.61% |
| ASIA PACIFIC | Thailand | iShares MSCI Thailand ETF (THD) | 14 years | 29.15% |
| ASIA PACIFIC | Taiwan | iShares MSCI Taiwan ETF (EWT) | 22 years | 16.31% |
| ASIA PACIFIC | Indonesia | iShares MSCI Indonesia ETF (EIDO) | 12 years | 9.72% |
| ASIA PACIFIC | ALL ASIA | iShares MSCI Emerging Markets Asia ETF (EEMA) | 10 years | 8.00% |
| LATIN AMERICA | Peru | iShares MSCI Peru ETF (EPU) | 13 years | -2.62% |
| ASIA PACIFIC | Philippines | iShares MSCI Philippines ETF (EPHE) | 11 years | -4.57% |
| LATIN AMERICA | Argentina | Global X MSCI Argentina ETF (ARGT) | 11 years | -5.66% |
| ASIA PACIFIC | China | iShares MSCI China ETF (MCHI) | 11 years | -16.03% |
| MIDDLE EAST | UAE | iShares MSCI UAE ETF (UAE) | 8 years | -37.91% |
| LATIN AMERICA | Chile | iShares MSCI Chile ETF (ECH) | 14 years | -48.24% |
| EUROPE | Turkey | iShares MSCI Turkey ETF (TUR) | 14 years | -50.99% |
| EUROPE | Greece | Global X MSCI Greece ETF (GREK) | 10 years | -51.49% |
| EUROPE | Poland | iShares MSCI Poland ETF (EPOL) | 12 years | -53.41% |
| ASIA PACIFIC | Malaysia | iShares MSCI Malaysia ETF (EWM) | 26 years | -61.54% |

*All Data is expressed in U.S. dollars as of 9/23/2022

Methodology

To determine if the percentage allocated into the primary country of investment for these funds has a relationship with the rate of return of these funds a regression analysis was performed. The independent variable for this regression was the percentage of the primary holding for the fund and the dependent variable was the ten-year rate of return for each emerging market fund. The ten-year holding average for each country was taken for each fund from 2012 to 2022 and the highest country average was used for the primary holding for that certain fund.

A regression was run for secondary and tertiary holdings as well using the same procedure to strengthen the claim that primary holding affects rate of return. After determining the primary holding for each fund these values allocated into the independent variable column since it is being tested whether this primary holding percentage affects rate of return for funds. For the dependent variable column, the ten-year rate of return for these funds was extracted from the PSN database. After gathering both variables a regression was run that generated the following equation where a is the y-intercept and b is the correlation coefficient:

$$\text{Rate of Return} = a + b (\text{Percentage Invested in Primary Country})$$

IV. Empirical Results

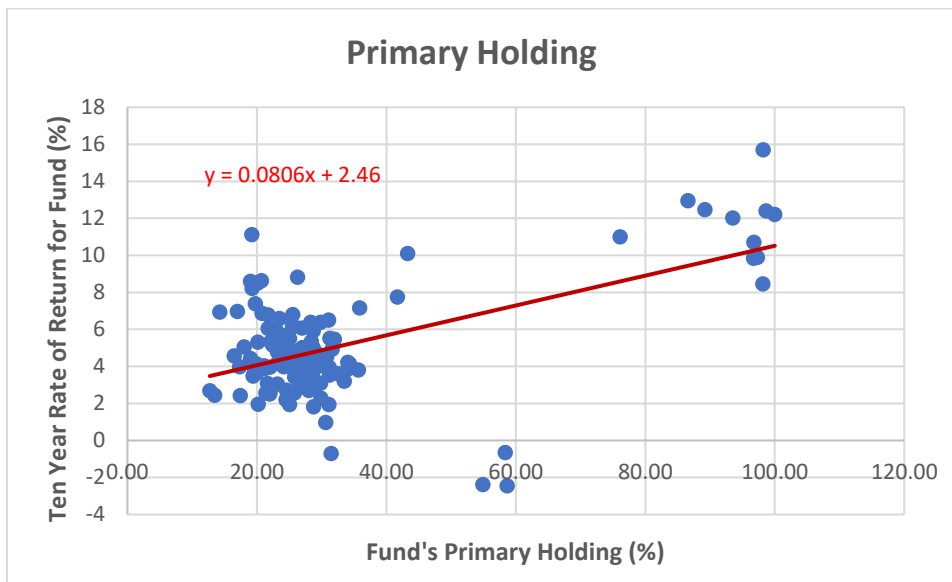
In this results section the regression between primary country percentage and the fund rate of return is generated. It is worth noting that the average primary country holding was 32.06 percent and the standard deviation for this value was 19.9 percent which shows that the primary country percentage varied greatly for each fund. After analyzing the equation and the linear regression graph in Exhibit 8 it appears that country one percentage is highly correlated with the fund ten-year rate of return.

The first item in the regression that is focused on is the R square value of 0.3160 which indicates that 31.60 percent of the variance in the rate of return can be explained by the size of the primary country investment. The coefficient of 0.0806 also shows that a fund's primary holding can affect the rate of return. When plugged into the equation above every 8.06 percent invested into the primary country for a fund resulted in an increase of one percent for that fund's rate of

return. This correlation coefficient is further backed with the regression's t-Stat value of 7.7569 which shows great confidence in the correlation coefficient.

The secondary and tertiary holding regressions further back this claim because as the secondary and tertiary holding percentage increases the rate of return decreases. Therefore, those funds who invested more in one holding are more likely to generate higher rate of returns than those who diversify their holdings across multiple countries.

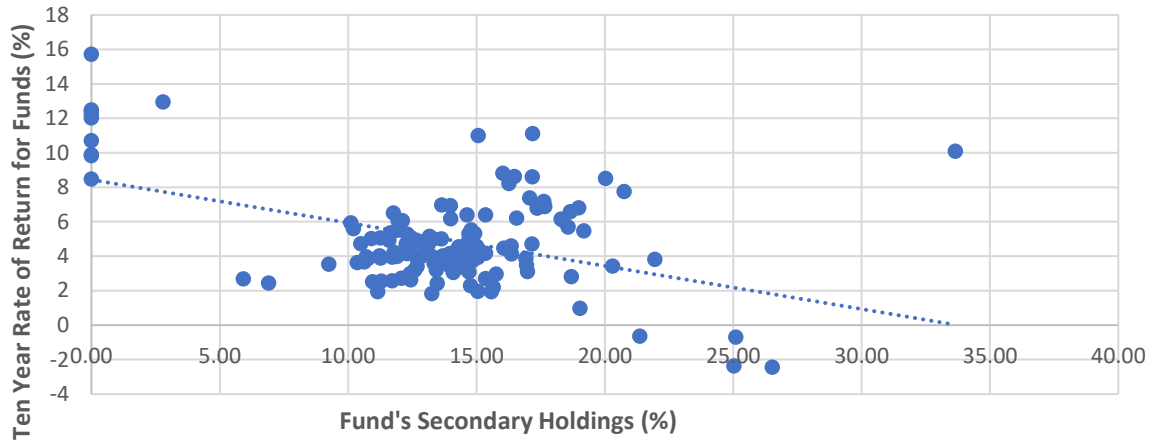
Exhibit 8. Linear Regression Between Fund Ten Year Rate of Return and Primary, Secondary, and Tertiary Country (%)



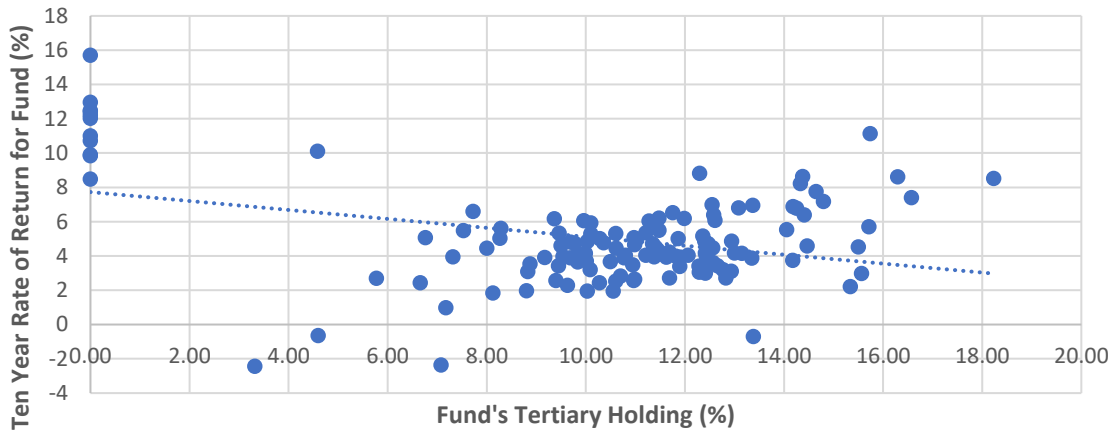
| | <i>Coefficients</i> | <i>Standard Error</i> | <i>t Stat</i> |
|---------------|---------------------|-----------------------|---------------|
| Intercept | 2.456 | 0.391 | 6.286 |
| Country 1 (%) | 0.081 | 0.010 | 7.780 |

| <i>Regression Statistics</i> | |
|------------------------------|-------|
| Multiple R | 0.562 |
| R Square | 0.316 |
| Adjusted R Square | 0.316 |
| Standard Error | 2.369 |
| Observations | 133 |

Secondary Holding



Tertiary Holding



V. Conclusion

This paper evaluates returns of emerging market mutual funds. The PSN Enterprise database is used from 2012 to 2022 to determine the rate of return for emerging market mutual funds and their portfolio allocation over this ten-year period. The regression performed with data from the 133 funds indicates that there is a strong positive relationship between the primary holding percentage and rate of return for these emerging market mutual funds. For every 8.06 percent increase in the primary country invested in there is a corresponding one percent increase in the rate of return.

There were several important results found after dissecting 133 emerging market mutual fund portfolios. The first finding was that Southern Asia is the primary holding for almost all these funds except for three which were invested in Brazil. Among these South Asian countries, it was found that the funds who invested primarily in India produced the highest rate of returns with those of 9.06 percent while Taiwan followed with a 7.48 return and China which was eighty percent of all fund's primary investment finished at third with a ten-year rate of return of 4.67 percent.

One shock was that the three funds invested in primarily Brazil and other Latin American countries averaged a ten-year rate of return of -1.82 percent. The second finding was that those funds who invested primarily in one emerging market country outperformed those who diversified their portfolios. For example, there were only nine of these funds that invested in only one country and all nine of these funds finished in the top twenty for rate of return. The funds invested in only one emerging market generated a return of 11.53 percent while those funds that diversified averaged a ten-year rate of return of just 4.57 percent. These results differ

from those of Kumar and Pfau (2011) who calculated that most emerging market portfolios would benefit from diversification.

The final finding was that the emerging market mutual funds had a lower ten-year rate return of 5.04% and had more risk in comparison to U.S. large cap S&P 500 mutual funds. Although emerging markets funds have more risk, they have generated lesser returns than domestic funds.

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