Investing in Europe

Turan G. Balia and K. Ozgur Demirtasb

As the financial crisis of 2008 quickly turned into a debt crisis of Europe, capital markets of EU (European Union) and EMU (European Monetary Union) countries suffered significant losses, whereas Emerging Markets enjoyed significant investor attention. Indeed, there is no theoretical justification of this investment behavior in modern portfolio theory. We use more than 144 Million daily data points of 64,051 stocks from 51 countries and show that investors excessively penalized securities in the Eurozone during the crisis period. In EMU and/or EU countries, securities that have bigger market capitalization, higher Price-to-Book ratios, higher Return on Equity and Return on Invested Capital, lower Dividend Yield, and lower Price-to-Earnings dominated alternative investments such as Emerging market investments. Securities with those certain characteristics continued to dominate alternative investments both before and after the crisis period. We conclude that unloading EU or EMU securities during the crisis period helped self-fulfill the prophecy of the European crisis.

Key words: Investing rules, Mean-Variance, Almost Stochastic Dominance, Eurozone Crisis,

JEL classification: G10, G11, G12

aTuran G. Bali is the Robert S. Parker Professor of Business Administration, McDonough School of Business, Georgetown University, Washington, D.C. 20057. Phone: (202) 687-3784, Fax: (202) 687-4031, E-mail: tgb27@georgetown.edu.

bK. Ozgur Demirtas is a chair Professor of Finance at the School of Management, Sabanci University, Orhanli, Tuzla 34956, Istanbul, Turkey. Phone: (216) 483-9663, Fax: (216) 483-9699, Email: ozgurdemirtas@sabanciuniv.edu.

**1. Introduction**

During the recent subprime mortgage crisis, we observe significant changes in investors' portfolio allocations in developed and emerging equity markets. During 2008, three of the largest U.S. investment banks either went bankrupt (Lehman Brothers) or were sold at fire sale prices to other banks (Bear Stearns and Merrill Lynch). These failures augmented instability in the global financial system. Between July 2007 and June 2010, a broad U.S. equity index, S&P 500, declined by 32%. Over the same period, Dow Jones Industrial Average (Dow 30 index) that includes highly liquid, large cap 30 stocks declined by 28%. On the other hand, investors with high exposures to emerging equity markets generated handsome returns during the crisis period 2007-2009. During the financial crisis period from July 2007 to June 2010, equity market index increased by 85% in Sri Lanka, 54% in Colombia, 44% in Indonesia, 43% in Venezuela, 26% in India, 24% in Chile, 11% in Brazil, Thailand, and Mexico, 7% in Argentina and South Africa, and 5% in Malaysia and South Korea. During the 2007-2009 period, total trading volume for both individual stocks and index funds significantly increased in these Emerging markets as well.

As the financial crisis of 2008 quickly turned into a debt crisis of Europe, capital markets of European Monetary Union (EMU) countries suffered significant losses. Indeed, Europe has not been hit this hard possibly since the second World War. On one hand, there has been millions of people suffering due to austerity measures, which result in severe cuts both in public and private spending, on the other hand, there are economies which find it extremely hard to grow.

Unfortunately, there is a big dilemma and a self-fulfilling prophecy regarding this huge economic crisis. The problem of Europe is simple. There are staggering national debts of European countries, there are huge budget deficits, and shrinking economies do not supply enough money to the system. What is urgently needed is attracting investment to the Eurozone (especially in the absence of credit from the banking sector). However, to pay their national debt, governments need to cut spending, which in turn, sharply cuts into the growth of the companies, and which in turn, stops investment to the Eurozone due to lack of confidence. This is a deadly loop, which proves harder by the day to get out. There is one point, which many economist and academic agrees on; that is, Eurozone needs investment that will flow into private companies. However, investors worldwide have other options such as investing in emerging markets. Even though, there is no theoretical justification (according to the modern portfolio theory), investors put significant amount of their investment to the Emerging economies, rather than Developed markets such as Europe.

In this paper, we conduct a painfully detailed analysis of this investment behavior. First, as European Markets tumble (like other developed markets such as US), Emerging Markets were doing much better. Second, investors usually penalize companies per the country they are listed in. If, for example, Italy has budget deficit, staggeringly high debt to income ratios and growth issues, investment to the country dries up and all Italian sectors gets penalized. However, if this is the case, many public companies would not be getting the necessary investor attention that they deserved due to the performance of the region that they are located in. These facts motivate this study to investigate the practice of investing in European and Emerging economies for different investment horizons and subsample periods. We undertake a huge task of examining all European public companies against World and Emerging market indices and argue that when state of the art techniques such as Almost Stochastic Dominance (ASD) and Almost Mean-Variance rules are applied, investors’ confidence in Emerging economies may be proved to be groundless in an expected utility framework.

We ask fundamental questions regarding the practice of investing in European and Emerging Economies. Do any one of the index investment dominates the other indices? Even if European equity market indices are dominated by other investments (such as the investments in Emerging Markets), are there certain companies in these European Markets, which would dominate alternative investments? If there are certain companies which dominate alternative investments (even if the index they are listed in is being dominated), what are the certain characteristics of these companies? And finally, do those characteristics change after the crisis year of 2008?

We find clear and concise answers to above questions. We consider six indices: World, Emerging and Developed indices as well as World excluding US, World excluding EMU (European Monetary Union) and Europe-EMU-only indices. At short investment horizons, none of these indices dominate one another in an Almost Dominance sense. However, at a 5-year investment horizon, Emerging market index dominates all other indices. Hence, it seems that an index investor would be better of investing in Emerging Markets index rather than Developed Market or EMU index.

At the firm level, even though we would like to focus on European public companies, all securities from all markets (51 countries) are considered. More than 144 Million daily observations are obtained for 64,051 stocks listed in 51 countries. For a one year investment horizon, we find that a significant 10.1% of the traded securities dominate the World index. 10.0% of the traded securities dominate the Developed Market index and 7.8% of the traded securities dominate the Emerging market index. We have also identified securities which dominated the very country that they are listed in. 12.8% of the securities around the world dominates their own country index.

EU countries for which there is sufficient DataStream data are considered. We show that 6.4% of the securities from Austria, 7.9% of the securities from Belgium, 4.9% of the securities from Denmark, 8.8% of the securities from Finland, that 10.7% of the securities from France, that 5.0% of the securities from Germany, 1.9% of the securities from Greece, 2.9% of the securities from Ireland, 4.1% of the securities from Italy, 4.1% of the securities from Netherlands, 4.9% of the securities from Portugal, 4.4% of the securities from Spain, 9.3% of the securities from Sweden, and 7.0% of the securities from UK dominates the Emerging Market index. We call these securities the “Dominant Securities”. What is interesting is that the percentage of dominant securities do not change significantly, when one considers before crisis period (period up to 2008).

Next, we examine the characteristics of the dominant securities in comparison to that the inferior securities. After Dominant EU and EMU securities that dominate the Emerging Market Index are determined, we show that: i) the dominant securities are bigger in size (on average Market Cap of Dominant securities are 840 Million Dollars larger than that of Inferior securities), ii) have higher Price-to-Book ratios (i.e., Dominant securities are glamour stocks), iii) have lower Dividend Payout ratios, iv) have lower Price-to-Earnings ratios, v) have higher Return on Equity, and vi) have higher Return on Investment Capital. These findings might well have derived by securities in a certain country. Hence, the analysis is repeated at the country level. We showed that the distribution of stock characteristics are stable and above mentioned findings are robust. Most importantly, these characteristics are similar when dominant security sample is determined by using the full sample and sample up to the crisis period.

Hence, we conclude that the investors’ behavior help self-fulfill the prophecy of the crisis. They excessively penalized certain securities in the Eurozone during the crisis period. Indeed, there are European securities with certain characteristics that continued to dominate alternative investments (such as investing in Emerging Markets) even after following the crisis period. This may very well show that unloading EU or EMU securities during the crisis period was the wrong thing to do which only helped to self-fulfill the prophecy of the European crisis.

The paper is organized as follows. Section 2 presents the motivation of study and describes the decision rules and investors’ preferences. Section 3 presents the data and its metrics. Section 4 evaluates the performance of regional indices based on the ASD approach. Section 5 presents results for the firm-level analysis. Section 6 concludes the paper.

**2. Motivation and Decision Rules**

**2.1 Motivation**

When investing, investors are often exposed to macroeconomic, financial, and political risk. Exchange rate, inflation, and interest rate changes, national and global financial crisis, political turmoils, and regulatory changes are extremely difficult to forecast. These unpredicted events may have adverse consequences for global equity portfolios, retirement plans for millions of people, and continuation of governments. Potential uncertainties generated by the aforementioned factors together with the opportunities in Emerging economies lead investors to choose between Developed and Emerging markets, more specifically between developed European countries and Emerging countries. Although a large number of individual and institutional investors (e.g., investment banks, hedge funds and mutual funds) invest on index funds or a portfolio of stocks trading in developed European markets and Emerging countries, we do not know whether Emerging market equity portfolios dominate developed market equity portfolios. We do not even know over which investment horizon Emerging or European market equity indices generate efficient investment opportunities. Hence, currently, there is no explanation of the world-wide investing behaviour, during the European crisis period, in an expected utility paradigm.

Indeed, despite an admirable performance of equity markets in emerging economies, the classical portfolio selection rules (such as the mean-variance and stochastic dominance rules) cannot identify a preference between emerging and developed European markets, creating an inconsistency between investors' asset allocation decision and modern portfolio theory. But if the classical selection rules in financial economics fail to explain investors’ choice of emerging markets versus European markets, what is the reason behind this failure? Are there any other selection rules, which would justify investing in Emerging equity markets?

Earlier studies on emerging economies point out important equity market characteristics: (i) High average returns (Bekaert, Erb, Harvey, and Viskanta (1998)), (ii) High volatility (Bekaert and Harvey (1997)), (iii) Non-normality characterized by skewness and excess kurtosis (Bekaert, Erb, Harvey, and Viskanta (1998)), (iv) Low correlations both across the emerging markets and with developed markets (Bekaert and Harvey (1995)), and (v) Persistent and predictable returns (Harvey (1995)). Even though these high-impact research studies focused on the equity market characteristics of developed markets (such as European countries) and Emerging markets, they do not examine why an investor would invest in a market versus the other.

Hence, first goal of the paper is to show that the classical selection rules cannot explain the recent preference of Emerging markets over European markets and to clearly identify the reason behind the failure of these classical rules. Next step involves utilizing state of the art Almost Dominance rules, which do not share the weaknesses of the classical rules, to find whether European equity market indices or Emerging market indices are efficient dominant investment alternatives.

Indeed, one of the most important and ambitious objective of this paper is to examine the daily return series of each public company in the Eurozone. We examine whether our general findings at the index level are generalized for specific companies. For example, neither Italy, nor France, neither Spain, nor Portugal, and neither Greece, nor Ireland, attracts necessary investment, simply because money in circulation goes into emerging markets. Funds may avoid companies even when they are sound investment alternatives, simply because of the country they are listed in. When Almost Dominance rules conclude that a European country does (or does not) dominate investments in Emerging markets, this finding cannot be generalized for all firms in that country. One European country may be an inefficient investment alternative, but there may be certain sectors and companies in that specific country, which deserve the attention of the investors.

In summary, securities in a certain market may be thrown out with the bathwater like the baby, while investors penalize certain regions due the deteriorating macro-economic conditions. This investment behaviour help fulfil the prophecy of the financial crisis.

Therefore, next big step is to dive into firm level data and find companies that dominate emerging markets as efficient investment alternatives in an expected utility framework and use simulations to obtain long term returns and examine the findings in a spectrum of investment horizons.

The preliminary examination of the index level data shows that European countries have been penalized excessively by the lack of investment. However, insight implies that even though European shares got hit by the financial crisis (hence they had low mean returns), higher order moments (such as skewness and kurtosis) works in favour of the European markets. Indeed, it is known that during and after the crisis period (post 2008) European equity market index returns have lower mean but higher skewness and lower kurtosis values, which are preferred by investors who have non-pathological utility functions. These higher order moments may not be sufficient for European index returns to be dominant investment alternatives, however certain securities within these markets may dominate alternative investment channels such as emerging markets. The methodology that we use in this project takes the whole return distributions into account. Therefore, since large companies in EU region share similar characteristics with the indices of the countries they are listed in, certain companies are anticipated to be found as efficient investment alternatives. Determining these very securities and their characteristics both before and after the crisis period is one of the main motivations of this study.

**2.2 Decision Rules**

**N-factor Models and Abnormal Returns:**

Solnik (1974), and Stulz (1981) extend the standard capital asset pricing model (CAPM) of Sharpe (1964) to an international setting that incorporates exchange rate risk along with world market risk and country-specific risk. Although the international capital asset pricing models (ICAPM) can be used to determine the relative strength of equity market indices in developed and emerging economies, the primary implication of the ICAPM is that there exists a positive linear relation between expected returns on equity market indices and their sensitivity to the world market portfolio, and variables other than the world market beta should not capture the cross-sectional variation in expected returns. However, many researchers have found that idiosyncratic factors such as country-specific risk, political risk, equity capital flows, global growth opportunities, size, liquidity, and past return characteristics have significant explanatory power for average returns on equity market indices. There is a long list of literature regarding these findings; see for example Bekaert and Harvey (2000), Bekaert, Harvey, and Lundblad (2002), and Bekaert, Harvey, Lundblad, and Siegel (2007). Given such a long list of factors, by using a parametric approach based on an N-factor model, one **cannot** surely determine whether emerging market equity portfolios dominate European market equity portfolios or vice versa, and this is an important disadvantage. Therefore, we do not rely on an N-factor model.

**Traditional Investment Selection Rules:**

Mean-Variance and Stochastic Dominance rules are considered as the traditional investment selection rules. In order for an investment choice *F* to dominate an investment choice *G* in a *mean variance dominance sense* (MV), the expected return on investment *F* should be higher than the expected return on investment *G*. In addition, the return volatility of investment *F* should be lower than the return volatility of investment *G*. In order for an investment choice *F* to dominate an investment choice *G* in a first order *stochastic dominance sense* (SD), cumulative distribution of investment *F* should “strictly” plot below the cumulative distribution of investment *G* (i.e., the probability of earning a lower return than a benchmark return is lower for investment *F*).

It is pretty clear that these rules are extremely restricted and will conclude that an investment A does not dominate investment B, even though almost all investors will choose investment A over investment B. Hence, it is highly unlikely that these classical selection rules identify a preference between emerging and developed markets. In other words, these classical rules cannot identify whether investing in developed European markets dominates investments in Emerging markets or vice versa.

Classical investment decision-making rules may fail to provide a preference between two portfolios, while it is clear that all investors or almost all investors would choose one portfolio over the other. The reason for this failure can be demonstrated by a simple example with two portfolios, H and L:

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
|  | |  |  | | --- | --- | |  |  | |  |  | | (1) |

where H and L represent portfolios with high and low expected returns, respectively. and denote, respectively, the expected return on portfolio H and L, whereas and denote the corresponding standard deviations. For portfolio H to dominate portfolio L by the Mean-Variance (MV) rule, both and must hold. As presented in the above example, portfolio H has a significantly higher expected return and slightly higher volatility, which implies no dominance in the MV framework. However, in a randomly selected group of investors, all would clearly choose portfolio H over portfolio L because the decline in their expected utility from the slightly higher volatility is much less than the increase in their expected utility from the significantly higher expected return. Hence, the MV rule is unable to distinguish between two investment choices though all investors would prefer H over L.

Further insight can be gained using cash flows for the H and L portfolios:

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  | |  |  |  |  | | --- | --- | --- | --- | | State | Probability | L | H | | Low | 1% | $2 | $1 | | Medium | 2% | $3 | $3 | | High | 97% | $4 | $1million | | (2) |

where the probability of each state (low, medium, and high) and the corresponding cash-flows of the portfolios H and L are given. For portfolio H to dominate portfolio L by the first order stochastic dominance (FSD) rule, the cumulative distribution of portfolio H should strictly plot below the cumulative distribution of portfolio L. As shown above, for most of the probable region, the cumulative distribution of H plots below that of L. However, there is a small violation area in the low state (in which portfolio H earns $1, whereas portfolio L earns $2). Therefore, portfolio H does not dominate portfolio L by the FSD rule. Yet, in any randomly selected sample of investors, one should not be surprised to find that all investors would choose H over L. On the other hand, for an investor with a utility function , H does not necessarily dominate L. But, this utility function implies that the investor is indifferent between getting $2 and $1million, hence, it is called a *pathological utility* function which is economically irrelevant.

Yet another example can be given with two options F and G:

|  |  |  |
| --- | --- | --- |
|  |  | (3) |

By the MV rule and by the SD rules [say, first degree SD (FSD) or second degree SD (SSD)], neither F nor G dominates the other. Yet, in a sample of investors, one again should not be surprised to find that 100% of the investors would choose F over G. And this example is not unique, as many other cases with such a paradox can easily be created. The drawback of these investment criteria (MV and SD) is that they are designed for all utility functions in a given class, e.g., all concave preferences, which unfortunately also contain pathological utility functions.

**Almost Dominance Rules:**

Indeed, earlier examples present the limitations of the decision rules based on extreme representations of the paradoxes. However, these examples are not unique, as many other cases with such a paradox can easily be created. To solve this issue, Levy and Leshno (2002) propose rules known as the Almost Stochastic Dominance (ASD) rules, which are appropriate after eliminating the pathological preferences. Several researchers, including the authors of this work, have utilized these rules in investment selection.[[1]](#footnote-1) Using these ASD rules, one can avoid paradoxes demonstrated earlier.

To be able go over Almost Stochastic Dominance rules, we first define the First-Degree Stochastic Dominance (FSD): To define FSD, let there be two risky portfolios, H and L, and denote as the cumulative distribution of H and L, respectively. Portfolio H dominates portfolio L by FSD for all return values r and a strict inequality holds for at least some r. In other words, for all where is the set of all non-decreasing differentiable real-valued functions. We may use these same risky portfolios to define Second-Degree Stochastic Dominance (SSD). H dominates L by SSD and a strict inequality holds for at least some r.

To introduce the concept of almost stochastic dominance rules, we first define the concept of violation area. When considering whether H dominates L, the region where the cumulative distribution of H is above the cumulative distribution of L is called the violation area (denoted by V in Figure 1), which is the reason why H fails to dominate L.

More specifically, the violation area V is where the FSD violation range is given by:

|  |  |  |
| --- | --- | --- |
|  |  | (4) |

Then the empirical violation area is defined as:

|  |  |  |
| --- | --- | --- |
|  |  | (5) |

where have a finite support, [min, max]. In equation (5), is defined as the area abov (i.e., area V in Figure 1) divided by the total *absolute* area enclosed between (i.e., area V + K in Figure 1).

Clearly implies FSD. On the other hand, when , there is no FSD, but there may be Almost FSD (AFSD). Whether H dominates L by AFSD depends on whether nonzero empirical violation area is small enough. What is small enough is an empirical question. Suppose that for each investor i, we observe the highest value of (denoted b) such that this investor prefers H over L. Then, the minimum of across all investors provides the critical value . In other words, even when H is not preferred over L due to a small violation area, as long as this violation area estimated by the empirical data is smaller than the critical value (i.), we conclude that H is preferred over L by AFSD. As originally discussed by Levy et al. (2010), is obtained from a series of experimental studies and found to be 5.9% for the AFSD rule. More formally, we may define AFSD as follows:

To define the Almost First Order Stochastic Dominance (AFSD), we first introduce the set of preferences as:

|  |  |  |
| --- | --- | --- |
|  |  | (6) |

Such that denotes the set of all non-decreasing utility functions excluding the pathological preferences. Then for all , H dominates L, if and only if. Note that this condition holds if and only if for all .

Figure 2 may be used to explain the Almost Second Order Dominance. As can be seen H has a much higher mean than L but due to the negative area within the return interval (i.e., area Q), there is no SSD of H over L because the integrated area between becomes positive at the beginning of area Q (by the return value ). When is below as shown in Figure 2. We may define the SSD violation range by:

|  |  |  |
| --- | --- | --- |
|  |  | (7) |

Given equation 7 above, the empirical SSD violation area is defined as:

|  |  |  |
| --- | --- | --- |
|  |  | (8) |

Where is defined as the area above , or in other words area Q in Figure 2, divided by the total absolute area enclosed between . As explained by Bali et al (2009), Bali, Brown, Demirtas (2013) and Levy et al. (2010), the critical value in this case ( is obtained from a series of experimental studies and found to be %3.2.

**3. Data**

Working with the international data requires careful collection and detail oriented analysis of the sample. We used DATASTREAM tapes to retrieve our data. There are certain attributes of the DATASTREAM data collection process, which has not been emphasized in the literature much. We will go over these details in this section.

Data is downloaded in pieces as the frame does not let the researcher to mass download the data. Mnemonic code is used when one downloads the data, however, mnemonic code is not a permanent ID. The permanent ID of the DataStream world is the DSCD. Hence right after data (for each country) is downloaded using mnemonic codes, DSCD codes are read as well.[[2]](#footnote-3)

Once the data is retrieved for 51 countries, we examine the trading ranges of each stock in each country. We work with Dollar denominated data. This creates a difficulty in determining the trading range for each stock. Specifically, a stock might have stopped trading, hence the price in local currency may be staying constant, but when there is a move in the exchange rate, dollar denominated price fluctuates. Therefore, one has to work with the local currency denominated version of the dataset as well. Thus, we retrieved two versions of the same data set. We determined the data range of each stock using local currency denominated data by tracking zero-return and missing-return days.

Dollar denominated dataset is used for the main analysis. Duplicate observations are removed. For each stock the active trading range is kept using local currency denominated data as explained above. Daily security returns are obtained using return index from Datastream (RI). Periods of five or more consecutive days of zero returns have been identified and removed.[[3]](#footnote-4) Data for countries excluding US has obvious data errors for Market Value. Analysis of the distribution of Market Value shows that it has high kurtosis, and within certain countries, specific stocks have been assigned an implausibly high or low market value. Therefore, market value has been truncated at 1 and 99 percentiles within each country excluding US.[[4]](#footnote-5) This step concludes the cleaned data formation for each country up to and including 2014. Similar steps are repeated to form a second earlier sample for each country which includes data up to and including 2008.

Monthly control variables are also retrieved. Market value (MV), Price-to-Book (PB), Dividend yield (DP), Price-to-Earnings (PE), Return on Equity (ROE), Return on Invested Capital (ROIC), and Total Assets (ASSETS) data are obtained. MV, PB, DP, and ASSETS values cannot take negative values, hence, negative values for these classifications are assigned missing values. Following the truncation process at 1 and 99 percentiles, average values of these control variables are computed for each security.

As a result, we work with a staggering 144,702,455 daily stock observations for 51 countries. In addition to daily stock data, we need country and regional level index returns. We computed country level daily returns using return index for each country. We further consider 6 separate regional indices: World, Emerging, Developed, World excluding USA, World excluding securities from European Economic and Monetary Union countries, and securities from European Economic and Monetary Union countries. These regional returns are labeled as World, Emerging, Developed, World-ex-Us, World-ex-Emu, and Europe-Emu-only, respectively.

Country level return price indices are not provided for three countries: Egypt, Morocco, and Vietnam. Therefore, for these countries, value weighted stock level daily returns are used to obtain country level returns. Hence Datastream country level returns are obtained for 48 countries using country level return price index provided by Datastream and country level data that is missing for 3 countries are replaced by value-weighted returns obtained by aggregating security level data. In addition to Datastream country level returns (DS), we also compute equal weighted and value-weighted country level returns for 51 countries. These alternative country level returns are utilized for robustness checks.

**4. Regional Indices**

As explained in the earlier section, we start by examining 6 regional indices. These indices are World, Emerging, Developed, World excluding USA, World excluding securities from European Economic and Monetary Union countries, and securities from European Economic and Monetary Union countries. These regional returns are labeled as World, Emerging, Developed, World-ex-Us, World-ex-Emu, and Europe-Emu-only, respectively.

Table 1 presents summary statistics for these 6 regional indices. All indices are considered for the sample period of Jan 3rd, 1995 and Dec 31st, 2014. For each index, we report average daily returns (Mean), Standard Deviation (Std.Dev), Minimum (Min), 25 percentile (25-pct), Median (Median), 75 percentile (75-pct), Maximum (Max), Skewness (Skew), Kurtosis (Kurt), and number of observations (Obs). To be able to compare these statistics across indices, we took a common sample starting from 1995. This is the period when emerging market index takes off. Hence all samples have equal number of observations (5217 daily observations).

Average daily returns are similar for all six indices. EMU index has the highest standard deviation. This mainly due to the European Debt Crisis period. Emerging Market Index and EMU Index have the lowest minimum daily returns, whereas EMU Index have the lowest 25-percentile and Median values among all six indices.

Although, among all indices, EMU Index has the most unfavorable right hand side of the distribution, together with lower mean and higher volatility, higher order moments work in favor of the index. Specifically, EMU Index has the highest skewness (-0.04672) and lowest kurtosis (8.81895) values among all indices. These attributes are considered favorable by an investor with a non-pathological utility function. One should not forget, however, these are daily returns. We consider much longer investment horizons when these indices are evaluated using almost dominance rules.

Our next goal is to examine if any one of these regional indices dominate others at various investment horizons. To be able to determine this, we may use extremely restricted mean-variance and stochastic dominance rules, or we may use the proposed almost dominance rules. As explained in Section 2, to decide on dominance using almost stochastic rules, we need to estimate epsilon values (. Next, we explain the empirical methodology employed to achieve this task.

We first examine the cumulative distributions of each regional index for investment horizons of 1-year, 3-year, and 5-year. For each investment horizon, the simulated data is formed by using daily return series. For a k-year investment horizon, we randomly pick 1000 observations points and start cumulating daily returns for k years from that point onwards.[[5]](#footnote-6) Hence, we obtain 1000 k-year return series. Once these return series are obtained for each regional index, we generate the cumulative distribution of index returns for each investment horizon. To estimate epsilons for two series, we first determine the minimum and maximum values of these two series.[[6]](#footnote-7) Then, we create a return bin, which consist of return values starting from the minimum return value going through the maximum with 0.1% increments. 0.1% is the precision parameter.[[7]](#footnote-8) Therefore, the size of this return bin depends on the minimum and the maximum values of the two return series and the precision parameter. Once the return bin is created, we compute the cumulative distributions by computing the percentage of times that an index incurs a lower return than the corresponding return value in the bin. As a result, the number of data points in the cumulative distributions is equal to the size of the return bin. We find the cumulative distribution for each regional index and investment horizon.

In Table 2, for each investment horizon, we take the difference of the cumulative distributions. Specifically, we define the difference as the cumulative distribution of the index at the first column minus the cumulative distribution of the index at the first row. For certain return intervals, a certain cumulative distribution will be above the other and for some other return intervals it will be the other way around.

Table 2 presents the values of for six regional indices. We report the results for 1-year, 3-year, and 5-year investment horizons. For each comparison, we define as the area between the cumulative distributions when the cumulative distribution of the index in the first column plots above the cumulative distribution of the index in the first row (V in Figure 1). Similarly, we define as the area between the cumulative distributions when the cumulative distribution of the index in the first-row plots above the cumulative distribution of the index in the first column (K in Figure 1). Consecutively, is defined as and is calculated using the simulated data for the sample period of Jan 3rd, 1995 and Dec 31st, 2014.

Panel A of Table 2 reports the epsilon values for a 1-year investment period, Panel B of Table 2 reports the epsilon values for a 3-year investment period, and Panel C of Table 2 reports the epsilon values for a 3-year investment period. At each investment horizon, in order for a series in the fırst column of each panel to dominate a series shown in the first row, the epsilon value should be lower than 0.059. Similarly, if an epsilon value is higher than 1-0.059, one may decide that the investment shown in the first column is dominated by the investment in the first row.

When we examine the summary statistics of these 6 regional indices in Table 1, it is clear that there is no mean-variance dominance across indices. In other words, in none of the pairwise comparisons, does an index have a higher mean and lower volatility. This is simply because the traditional investment selection rule, mean-variance dominance, is restrictive and does not take pathological utility functions into account. We may reach similar conclusions regarding the first order stochastic dominance rule. In order for a regional index to dominate another index in a first order stochastic dominance sense, the cumulative distribution of that index should plot strictly below that of the other. Examination of the cumulative distributions show that there is not first order stochastic dominance across regional indices either. Again, the reason is that FSD rule does not take pathological utility functions into account. Hence, we move to almost dominance rules.

As shown in Panel A of Table 2, at a 1-year investment horizon, none of the regional indices dominate one another as none of the epsilon values are lower than the critical value. We may not conclude that any one of the investments is an inefficient investment. But we may conclude that there is no dominant investment alternative at this horizon. Panel B of Table 2 yields qualitatively similar results at a 3-year investment horizon.

Panel C of Table 2, on the other hand, shows that at a 5-year investment horizon, is 0.0577 when Emerging market index is compared with the Developed market index, is 0.0489 when Emerging market index is compared with the World excluding US index, is 0.0453 when Emerging market index is compared with the World excluding EMU index, and is 0.0041 when Emerging market index is compared with the Europe EMU only index. All of these values are lower than the critical value. Hence, we conclude that the Emerging Market investment dominates other alternatives in an almost stochastic dominance sense.

Indeed, one of the strongest comparison is between investment in Emerging market index and investment in European Monetary Union index. We obtain the lowest epsilon value for that comparison. Showing that the investors are better of choosing Emerging market index over investing in the EMU region. is 0.0041 when Emerging market index is compared with the Emu index. This in line with the common observation that Emerging markets are preferred by investor whenever developed markets, such as EMU countries, are in trouble.

**5. Firm Level Analysis**

**5.1 Descriptive Statistics across and within Countries**

The fact that investing in Emerging markets dominates European markets at the index level, does not necessarily mean that every security in the Euro zone is an inefficient investment alternative. Our main goal, in this paper, is to pinpoint securities in each country that dominates alternative indices. Examine their characteristics using data both before the European Debt crisis and the full sample. Even if a specific country or a region may be dominated by alternative investments, there may be certain stocks in that country or region that might have been thrown out with the bath water like a baby.

In this section, we first start by examining the summary statistics within each country. Table 3 presents the summary statistics at the country level. Statistics are reported for 51 countries. We report Average daily returns (Mean), Standard Deviation (Std.Dev), Minimum (Min), 25 percentile (25-pct), Median (Median), 75 percentile (75-pct), Maximum (Max), Skewness (Skew), Kurtosis (Kurt), and number of observations for each country. Firm level daily returns and market capitalizations are considered as a panel data when we compute these statistics.

Panel A of Table 3 reports panel statistics for daily returns. As the last row the panel shows, we consider 144,702,455 daily observations to come up with these statistics. Venezuela has the lowest number of daily observations. Venezuelan stocks have 74,908 daily observations. Whereas US has the highest number of observations standing at 30,550,363.

All securities in each country are considered for the sample period Jan 3rd, 1995 and Dec 31st, 2014. In each country, statistics are computed by considering the daily firm level return and market capitalizations as a panel. Average daily returns (Mean), Standard Deviation (Std.Dev), Minimum (Min), 25 percentile (25-pct), Median (Median), 75 percentile (75-pct), Maximum (Max), Skewness (Skew), Kurtosis (Kurt), and number of observations are reported. Panel A reports the panel statistics for daily returns and Panel B reports the panel statistics for market value. Average daily firm returns are ranging from -0.02% to 0.21%. Average standard deviations of stock daily returns are between 0.0195 and 0.0461. Indonesia has the most volatile stock returns in the sample. Average minimum returns are between -0.5039 and -0.0678. The lowest minimum returns are observed in Luxembourg. This measure may be considered as a proxy for the Value-at-Risk. There is not a single country which has a negative average skewness. Average kurtosis stand at 19,1101 meaning that the sample has thick tails.

Panel B of Table 3 reports panel statistics for daily market value. Average daily market value is between 33.2 million dollars and 3.315 billion dollars. One might expect that the average company size will be the highest in US. However, Russian stocks have a larger average size. This due to large energy companies dominating the Russian capital markets. Indeed, if one looks at the maximum daily market values. US, by far, dominates the Russian sample. Smallest stocks are located in Srilanka. Average volatility of market cap ranges between 70.6 and 12,963 observed for Srilanka and US, respectively. It is clear that US has the most diverse sample when market capitalization is considered. There is a positive skewness of daily market value in each country. And US has a strongly fat tailed distribution as evidenced by the diverse sample.

**5.2 Almost Dominance around the World**

We then estimate epsilon values for each security in our sample in comparison to various regional and country level indices and certain investment frequencies. Epsilons ( are estimated as explained in Section 4.

Table 4 reports detailed statistics for these estimations. We examine the cumulative distributions of all securities in 51 countries in comparison to 7 separate indices at daily, monthly, semi-annually, and annually investment horizon frequencies. Those 7 indices are World, World excluding EMU, World excluding US, Developed, Emerging, EMU only and 51 country indices. We estimate an for each horizon and comparison. Specifically, as overviewed earlier, we define as the area between the cumulative distributions when the cumulative distribution of the stock plots above the cumulative distribution of the index it is compared to (V in Figure 1). Similarly, we define as the area between the cumulative distributions when the cumulative distribution of the index plots above the cumulative distribution of the stock (K in Figure 1). is defined as .

Panels A and B of Table 4 considers the full sample for each security. Panels C and D of Table 4, on the other hand, takes data up to 2008 for each security. In Panel A of Table 4, we report descriptive statistics of epsilons for each comparison and investment horizon. Other than the case where distributions of individual securities are compared to Emerging market index, we use 49,939 securities around the world. In the Emerging market case the number of securities used are slightly lower at 46622, because of the late start date of the Emerging market index. We report Mınimum, 1 percentile, median, 99 percentile and maximum values of the epsilons. Lowest epsilons are obtained at longer investment horizons. At semi-annual and annual investment horizons, even 1 percentile of the distribution of epsilons is lower than the critical value of 5.9%. This implies that at these horizons, at least 1% of the securities dominate 7 regional and country level indices.

Next, we examine the number of securities world-wide, that dominates alternative indices, for various investment horizons. Panel B of Table 4 reports the number and percentage of securities that have values lower than the critical level (i.e., number and percentage of dominant securities). The fırst set of Panel B shows the number and percentage of securities that dominate the World index. There are 5024 stocks that dominate the World index at the annual investment horizon. That accounts for 10.1% of all securities in the sample. Similarly, there are 2544 securities that dominate the World index at the semi-annual investment horizon and that accounts for 5.1% of all securities in the sample. It is clear that securities world-wide have a higher chance of dominating alternative indices at longer investment horizons. This is expected as there is time-diversification of higher order moments. A security with a higher mean but a higher volatility than the compared index does not dominate the index in terms of the traditional selection rules such as mean-variance and stochastic dominance rules. However, as the returns are compounded, mean returns grow more than the higher order moments. At a certain point the region where the security has an unfavourable distribution compared to that of the index becomes small enough such that we conclude the security almost stochastically dominates the index.

According to Panel B of Table 4, the lowest amount of dominant securities is found when the comparison is made against the Emerging market index. This is an artefact of Emerging markets being an alternative investment alternative. 3659 securities are found to dominate the Emerging market index, that amounts to 7.8% of all securities in that sample. We also examine the case where securities are compared to their own country index. The last set in the panel shows that 6399 securities world-wide dominate their own country index at the annual investment horizon, that is 12.8% of all securities in the sample.

We then repeat the analysis by utilizing an earlier sample. Data up to pre-crisis period of 2008 is used. Panel C of Table 4 shows the descriptive statistics of World-wide epsilons. Again, for longer term investment horizons 1 percentile of epsilons are lower than the critical value. Distribution of epsilons are slightly tilted to the left. When we examine the number and percentage of dominant securities in Panel D, except the case of Emerging and EMU index, the percentage of dominant securities are higher in this pre-crisis sample. At an annual frequency, 11.3% of all securities dominate the World index, 11.9% of all securities domşnate the World excluding EMU index. 13% of all securities dominate the World excluding US index and 11.5% of all securities dominate the Developed index. These percentages are slightly higher than the ones in Panel B of Table 4. However, with-in country analysis may present a much clearer picture. In each of the 51 countries, how many of the securities are dominant securities both when we consider the full sample and the earlier sample? Does any one of the specific countries drive the results in Table 4? Next, we examine this in detail.

**5.3 Dominant Securities**

After obtaining an epsilon value for each stock in each country and investment horizon, we examine those stocks that dominate each one of the indices. Specifically, we examine the cumulative distributions of all securities in 51 countries in comparison to separate indices at monthly, semi-annually, and annually investment horizon frequencies. Estimated epsilons are used to determine dominant securities in each country. As explained earlier, to estimate values, we first construct the cumulative distribution of each stock and index. We used daily returns and simulations to form the cumulative distributions. Once we obtain cumulative distributions at various investment horizons for each security, we define as the area between the cumulative distributions when the cumulative distribution of the stock plots above the cumulative distribution of the index it is compared to (V in Figure 1). Similarly, we define as the area between the cumulative distributions when the cumulative distribution of the index plots above the cumulative distribution of the stock (K in Figure 1). Then, is defined as . Panel A and C of Table 5 report, in each country, the number of securities that dominate the World, World excluding US, Emerging and Country indices at 1-month, 6-month, and 12-month investment horizons. Panel B and D of Table 5 report the corresponding percentages of the dominant securities in each country.

In Panel A and B of Table 5, we use the full sample for each security. In Panel C and D of Table 5, we use the sample up to 2008 (i.e., pre-crisis period). In Panel A of Table 5, we report the number of dominant securities in each country. Light grey rows show results for European Monetary Union countries for which DATASTREAM sustains data points. Those countries are Austria, Belgium, Finland, France, Germany, Greece, Ireland, Italy, Netherlands, Portugal, and Spain. Dark grey rows are additional three countries which are in EU both not in EMU: Denmark, Sweden, and UK as of 2014.

As observed before, the number of dominant securities rise as the investment horizon gets longer. For all EU and EMU countries, for 12-month investment horizon, except Greece, number of securities that dominate the World excluding US index are higher than the securities that dominate the World index. Performance of US stocks in the sample is the culprit.

Another clear observation is that for all EMU and EU countries, the number of securities that dominate the emerging market index is less than the number of securities that dominate the World index. This shows a preference towards Emerging Markets. However, one has to note that there are still a non-zero number of securities which are able beat an investment to the Emerging Market index in an Almost Stochastic Dominance sense.

Percentages of dominant securities shed a better light on the results. At an annual investment horizon, 12% of the stocks in Austria, 23.4% of the stocks in Belgium, 12% of the stocks in Denmark, 9.8% of the stocks in Finland, 18% of the stocks in France, 8.6% of the stocks in Germany, 4.2% of the stocks in Greece, 11.6% of the stocks in Ireland, 6.7% of the stocks in Italy, 15.2% of the stocks in Netherlands, 7.6% of the stocks in Portugal, 10.1% of the stocks in Spain, 11.4% of the stocks in Sweden, and 11.8% of the stocks in UK dominate the World index. Considering all 51 countries, on average 12.6% of stocks in each country dominate the World market. Hence, these numbers are not much different for EU countries with an exception of Greece, Italy and Spain which were at the headlines during the crisis period.

Again at an annual investment horizon, 6.4% of the stocks in Austria, 7.9% of the stocks in Belgium, 4.9% of the stocks in Denmark, 8.8% of the stocks in Finland, 10.7% of the stocks in France, 5.0% of the stocks in Germany, 1.9% of the stocks in Greece, 2.9% of the stocks in Ireland, 4.1% of the stocks in Italy, 4.1% of the stocks in Netherlands, 4.9% of the stocks in Portugal, 4.4% of the stocks in Spain, 9.3% of the stocks in Sweden, and 7.0% of the stocks in UK dominate the Emerging Market index. As expected, the percentage of securities in EU and EMU countries that dominate the Emerging market index is less than the percentage of securities that dominate the World index.

In Panels C and D of Table 5, we repeat our analysis using an earlier sample. As shown in Panel D of Table 5, at an annual investment horizon, 17.3% of the stocks in Austria, 24.1% of the stocks in Belgium, 22.1% of the stocks in Denmark, 15.6% of the stocks in Finland, 21.0% of the stocks in France, 11.4% of the stocks in Germany, 4.5% of the stocks in Greece, 11.2% of the stocks in Ireland, 10.3% of the stocks in Italy, 18.3% of the stocks in Netherlands, 10.4% of the stocks in Portugal, 17.6% of the stocks in Spain, 13.0% of the stocks in Sweden, and 12.7% of the stocks in UK dominate the World index. With the exception of Ireland and UK, all EU and EMU countries have a higher percentage of stocks that dominate the World index when the earlier sample is used. This is expected as crisis period’s more than awful returns are not included in this sample for European stocks. However, this is not the case for the Emerging Market comparison as some European countries have a higher percentage of dominant securities before the crisis period and some other countries have a higher percentage of dominant securities when the full sample is used. This is mostly because of the come-back returns of European securities during 2013 and 2014.

One thing is clear though: Significant percentage of securities in EMU and EU countries, dominate World and Emerging index regardless of the debt-crisis period. Hence, if there is any security which has lacked the necessary investor attention due to the financial debt crisis of the country they are listed in, this might have been an extreme punishment. As in both samples, there is a significant number of European securities that dominate alternative investments. Next, we find out the characteristics of those dominant securities.

**5.3 Characteristics of Dominant Securities**

It is clear that certain stocks in EU and EMU countries dominate the World and the Emerging markets. What are the characteristics of these dominant securities? Do these characteristics change when dominant securities are determined using sample before the crisis?

To answer these questions, we examine the cumulative distributions of annual returns of all securities in EU and/or EMU countries in comparison to World index, Emerging index and Country index. values are estimated for each security as explained earlier. Dominant and inferior securities are determined using Almost Dominance rules. Therefore, within each country, we have certain securities that are labelled to be dominant and the remaining ones are labelled as inferior. Time-series averages of monthly characteristics of each security is also computed.

Table 6 reports cross-sectional average of time-series mean Market value (MV), Price-to-Book (PB), Dividend Yield (DP), Price-to-Earnings (PE), Return on Equity (ROE), and Return on Invested Capital (ROIC) for both dominant and inferior securities in EU and/or EMU markets. Panel A reports results for the full sample. Panel B reports results for the sample up to 2008. The first block in each panel determines the dominant and inferior samples using a comparison against the World index. The second block in each panel determines the dominant and inferior samples using a comparison against the Emerging index. Finally, the third block in each panel determines the dominant and inferior samples using a comparison against the Country index.

The first block of Panel A of Table 6 shows that securities which dominate the World index at an annual investment horizon have a size of 1.346 Billion dollars, whereas the inferior securities have an average market cap of 755 Million dollars. Hence, dominant securities are larger in size. Similarly, Price-to-Book ratio of dominant securities are higher than that of inferior securities (3.176 vs 2.495). Dominant stocks have lower Dividend Yield and a lower Price-to-Earnings ratio. Dominant securities have a higher Return on Equity at 11.65%, whereas inferior securities have a negative return on equity standing at -2.698%. Similarly, average Return on Invested Capital is higher for dominant securities (9.76% vs 1.98%).

These stark differences in average characteristics are even more drastic when we examine the Eurozone securities that dominate the Emerging market investments. The second block in Panel A of Table 6, shows that the average market cap of dominant securities is even larger that of inferior securities. Securities in EU and EMU countries that dominate the Emerging market index have an average market cap of 1.628 Billion dollars, whereas inferior securities have a much smaller average size of 788 Million dollars. Price-to-Book ratio, Return on Equity, and Return on Invested capital of dominant securities are significantly higher than those of inferior securities, whereas, Price-to-Earnings and Dividend Yield of dominant securities are significantly lower than those of inferior securities.

The last block of Panel A of Table 6 shows the average characteristics when dominant securities are determined in comparison to the self-country index. Surprisingly, almost all comparisons of the characteristics are in line with earlier findings. A security in the Eurozone which dominates its own country index have a higher market cap (1.361 Billion dollars vs 657 Million dollars), higher Price-to-Book ratio (2.891 vs 2.502), lower Dividend Yield (4.468 vs 5.196), lower Price-to-Earnings (25.8 vs 35.6), higher Return on Equity (12.727% vs -4.449%) and higher Return on Invested Capital (9.98% vs 1.04%). We conclude that what takes for one security to dominate its own country index are similar to what it takes to dominate World and Emerging indices. Although Emerging Market index is harder to dominate, hence the differences in characteristics are more extreme.

We now know the characteristics of securities which dominate certain indices. Do those characteristic comparisons changed after the crisis period? Panel B of Table 6 replicates what Panel A achieves using an earlier sample period up to 2008. Result are striking such that almost all comparisons in three separate blocks are similar when an earlier period is used. This shows that what it takes to dominate a certain index does not change before or after the crisis period. Dominant securities have a higher market cap, Price-to-Book ratio, Return on Equity, and Return on Invested Capital and a lower Price-to-Earnings ratio and Dividend Yield. Thus, if an investor with an annual investment horizon, have chosen securities with higher market cap, Price-to-Book, Return on Equity, and Return on Invested Capital and a lower Price-to-Earnings ratio and Dividend Yield Return on Equity, and Return on Invested Capital and a lower Price-to-Earnings ratio and Dividend Yield, he/she is more likely to dominate Emerging market investments both before and after the crisis period.

There is a likelihood of certain countries dominating the results in Table 6. Can we generalize the results in Table 6 to all EU and EMU countries? Or the results are driven by certain countries? To find this out, we next dive into country level analysis.

Table 7 and 8 reports cross-sectional averages of time-series means of certain characteristics at the country level. Table 7 reports results using the full sample and Table 8 reports results using the sample up to 2008.

Each panel in Table 7 has three blocks. The first block presents the statistics for the dominant sample, the second block presents the statistics for the inferior sample and the third block reports the differences in the first two blocks. We examine these characteristics for Austria, Belgium, Denmark, Finland, France, Germany, Greece, Ireland, Italy, Netherlands, Portugal, Spain, Sweden, and UK.

In Panel A of Table 7, we determine the securities which dominate the World index. Out of 14 countries, dominant securities in 12 countries have a higher market cap than the market cap of inferior securities. Dominant securities in 11 countries have a higher Price-to-Book than that of the inferior securities.Dominant securities in 9 countries have lower Dividend Yield than that of the inferior securities. Dominant securities in all 14 countries have a higher Return on Equity than that of the inferior securities and similarly dominant securities in all countries have a higher Return on Invested Capital than that of the inferior securities.

There is a stark difference in Return on Equity and Return on Invested Capital of Dominant and Inferior securities. For example, In Austria, Dominant securities have an average Return on Invested Capital of 4.97% and Inferior securities have an average Return on Invested Capital of -0.685%. In Belgium the ratios are 5.94% vs 3.52%, in Denmark the ratios are 9.25% vs 2.20%, in Finland the ratios are 13.74% vs 6.39%, in France the ratios are 9.85% vs 2.57%, in Germany the ratios are 7.88% vs -1.14%, in Greece the ratios are 5.80% vs 4.80%, in Ireland the ratios are 12.75% vs 2.72%, in Italy the ratios are 9.02% vs 2.34%, in Netherlands the ratios are 10% vs 8.36%, in Portugal the ratios are 9.89% vs 4.04%, in Spain the ratios are 10.34% vs 7.29%, in Sweden the ratios are 12.95% vs -9.16%, and finally, in UK the ratios are 14.31% vs -5.47%. Return on Equity comparisons yield similar results.

Panel B of Table 7 shows again that the results across countries are uniform. Specifically, securities in EU and EMU countries which dominate the Emerging Market investments have on average higher market cap, Price-to-Book ratio, Return on Equity, and Return on Invested Capital. On the other hand, those dominant securities have lower Dividend yield and Price-to-Equity.

When we label securities as dominant securities whenever they almost stochastically dominate their own country index, the average characteristics of these dominant securities vs those of inferior securities do not fluctuate across countries. Similar to Panel B of Table 7, Panel C shows that dominant securities have on average higher market cap, Price-to-Book ratio, Return on Equity, and Return on Invested Capital. On the other hand, those dominant securities have lower Dividend yield and Price-to-Equity.

Hence, we conclude that the results in Table 6 are representative and are not dominated by a certain country in the EU and EMU region. When we use the full sample, we show that securities which dominate the World index, Emerging market index, and Country index have higher market capitalization, higher Price-to-Book, lower Dividend Yield, lower Price-to-Earnings, higher Return on Equity and higher Return on Invested Capital.

Next and final question is whether above conclusions are valid when we use before the crisis sample (i.e., sample up to 2008). Table 8 presents results using the earlier sample. It is clear that in almost all of the cases, dominant securities have higher market capitalization, higher Price-to-Book, lower Dividend Yield, lower Price-to-Earnings, higher Return on Equity and higher Return on Invested Capital.

We conclude that the characteristics of the dominant securities are qualitatively similar before and after the debt-crisis period. Types of Eurozone securities which dominate the World and Emerging index have not changed after the crisis period. Hence, a certain investor would be better off not changing the invested securities in the Eurozone after the crisis period.

Dominant securities in the EU and EMU countries are glamour stocks, they are larger in size, pay less dividends compared to the per share price. Moreover, those companies are significantly more profitable such that they have higher Return on Equity and Return on Invested Capital. Investing in those types of securities worked well for the investors before the crisis period hit Eurozone. More importantly, similar types of securities beat alternative investments both during and after the crisis period.

**7. Conclusion**

Past decade has been a period of World-Wide financial crisis. What started as mortgage-backed security crisis in US turned into a Sovereign-Debt crisis of Europe. Central banks across the developed countries flooded the system with liquidity which has met a resistance turning into credit to the companies. Rather, the excessive liquidity funded Emerging markets, while capital markets of EU (European Union) and EMU (European Monetary Union) countries suffered significant losses.

In order for an investment to be preferred to another in a mean variance sense, it needs to have a higher expected return and lower expected volatility. Similarly, in order for an investment to be preferred to another in a stochastic dominance sense, its cumulative distribution needs to plot below that of the other investment. These are strict rules and the practice of investing in Emerging markets vs the Developed markets cannot be explained by these rules. We employ recently developed Almost Dominance rules to see whether investing in Emerging markets is justifiable. We show that at significantly long term investment horizons and at the index level, Emerging markets dominate other alternatives.

Stock indices in the Eurozone might well be dominated alternatives, but this does not mean that every security listed in these indices is an inefficient alternative. We use more than 144 Million daily data points of 64,051 stocks from 51 countries and show that investors excessively penalized securities in the Eurozone during the crisis period. In each country and at various investment horizons, we determine securities that dominate several regional indices.

We show that on average 10% of the securities World-wide dominate the World index and 8% of them dominate the Emerging market index. 11.6% (6%) of the securities in EU and EMU countries dominate the World index (Emerging market index). Hence, there are certain securities in European developed markets which dominated investments in alternative markets. In EMU and/or EU countries, securities that have bigger market capitalization, higher Price-to-Book ratios, higher Return on Equity and Return on Invested Capital, lower Dividend Yield, and lower Price-to-Earnings dominated alternative investments such as Emerging market investments.

We emphasize that the securities with those certain characteristics continued to dominate alternative investments both before and after the crisis period (2008). We conclude that unloading EU or EMU securities during the crisis period helped self-fulfill the prophecy of the European crisis.

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**Table 1**

Summary Statistics for Regional Indices

This table presents the summary statistics for regional daily returns. Statistics are reported for six regional indices: World, Emerging, Developed, World excluding Us stocks, World excluding stocks listed in a European Monetary Union country, and Stocks listed in a European Monetary Union country. These indices are labeled as: World, Emerging, Developed, World-ex-Us, World-ex-Emu, and Europe-Emu-only, respectively. All indices are considered for the sample period Jan 3rd, 1995 and Dec 31st, 2014. For each index, Average daily returns (Mean), Standard Deviation (Std.Dev), Minimum (Min), 25 percentile (25-pct), Median (Median), 75 percentile (75-pct), Maximum (Max), Skewness (Skew), Kurtosis (Kurt), and number of observations are reported.

|  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  | **Mean** | **Std.Dev** | **Min** | **25-pct** | **Median** | **75-pct** | **Max** | **Skew** | **Kurt** | **Obs** |
| **World** | 0.00033 | 0.00930 | -0.06437 | -0.00392 | 0.00078 | 0.00489 | 0.08523 | -0.29407 | 10.50785 | 5217 |
| **Emerging** | 0.00033 | 0.01077 | -0.09361 | -0.00440 | 0.00091 | 0.00594 | 0.09381 | -0.60389 | 10.77977 | 5217 |
| **Developed** | 0.00034 | 0.00943 | -0.06415 | -0.00402 | 0.00079 | 0.00496 | 0.08981 | -0.24981 | 10.42192 | 5217 |
| **World-ex-Us** | 0.00029 | 0.00989 | -0.07740 | -0.00435 | 0.00078 | 0.00555 | 0.07352 | -0.36405 | 9.73565 | 5217 |
| **World-ex-Emu** | 0.00033 | 0.00915 | -0.06563 | -0.00379 | 0.00078 | 0.00486 | 0.08086 | -0.31477 | 10.31812 | 5217 |
| **Europe-Emu-only** | 0.00039 | 0.01301 | -0.09336 | -0.00565 | 0.00064 | 0.00701 | 0.10676 | -0.04672 | 8.81895 | 5217 |

**Table 2**

Almost First Order Stochastic Dominance of Regional Indices

This table presents the values of for six regional indices. Results are reported for 1-year, 3-year, and 5-year investment horizons. For each comparison, we define as the area between the cumulative distributions when the cumulative distribution of the index in the first column plots above the cumulative distribution of the index in the first row (V in Figure 1). Similarly, we define as the area between the cumulative distributions when the cumulative distribution of the index in the first-row plots above the cumulative distribution of the index in the first column (K in Figure 1). is defined as and is calculated using the simulated data for the sample period of Jan 3rd, 1995 and Dec 31st, 2014. Panel A reports the epsilon values for a 1-year investment period, Panel B reports the epsilon values for a 3-year investment period, and Panel C reports the epsilon values for a 3-year investment period.

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| Panel A. Epsilon Values for 1-year Investment Horizon | | | | | | |
|  | **World** | **Emerging** | **Developed** | **World-ex-Usa** | **World-ex-Emu** | **Europe-Emu-only** |
| **World** |  | 0.5850 | 0.4262 | 0.3809 | 0.3431 | 0.6427 |
| **Emerging** |  |  | 0.4068 | 0.2386 | 0.3536 | 0.2740 |
| **Developed** |  |  |  | 0.4577 | 0.3225 | 0.6173 |
| **World-ex-Usa** |  |  |  |  | 0.5428 | 0.7812 |
| **World-ex-Emu** |  |  |  |  |  | 0.6735 |
| **Europe-Emu-only** |  |  |  |  |  |  |

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| Panel B. Epsilon Values for 3-year Investment Horizon | | | | | | |
|  | **World** | **Emerging** | **Developed** | **World-ex-Usa** | **World-ex-Emu** | **Europe-Emu-only** |
| **World** |  | 0.7177 | 0.5076 | 0.4557 | 0.2910 | 0.7090 |
| **Emerging** |  |  | 0.2598 | 0.2018 | 0.2139 | 0.2585 |
| **Developed** |  |  |  | 0.4328 | 0.3877 | 0.7021 |
| **World-ex-Usa** |  |  |  |  | 0.5043 | 0.7082 |
| **World-ex-Emu** |  |  |  |  |  | 0.6914 |
| **Europe-Emu-only** |  |  |  |  |  |  |

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| Panel C. Epsilon Values for 5-year Investment Horizon | | | | | | |
|  | **World** | **Emerging** | **Developed** | **World-ex-Usa** | **World-ex-Emu** | **Europe-Emu-only** |
| **World** |  | 0.9552 | 0.0891 | 0.8259 | 0.2166 | 0.6836 |
| **Emerging** |  |  | 0.0577 | 0.0489 | 0.0453 | 0.0041 |
| **Developed** |  |  |  | 0.8611 | 0.5932 | 0.8167 |
| **World-ex-Usa** |  |  |  |  | 0.2307 | 0.6580 |
| **World-ex-Emu** |  |  |  |  |  | 0.7196 |
| **Europe-Emu-only** |  |  |  |  |  |  |

**Table 3**

Descriptive Statistics across and within Countries

This table presents the summary statistics at the country level. Statistics are reported for 51 countries. All securities in each country are considered for the sample period Jan 3rd, 1995 and Dec 31st, 2014. In each country, statistics are computed by considering the daily firm level return and market capitalizations as a panel. Average daily returns (Mean), Standard Deviation (Std.Dev), Minimum (Min), 25 percentile (25-pct), Median (Median), 75 percentile (75-pct), Maximum (Max), Skewness (Skew), Kurtosis (Kurt), and number of observations are reported. Panel A reports the panel statistics for daily returns and Panel B reports the panel statistics for market value.

|  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Panel A. Summary Statistics for Daily Return | | | | | | | | | | |
| **Countries** | **Mean** | **Std.Dev** | **Min** | **25-pct** | **Median** | **75-pct** | **Max** | **Skew** | **Kurt** | **Obs** |
| Argentina | 0.0011 | 0.0313 | -0.3215 | -0.0125 | 0.0000 | 0.0129 | 0.3030 | 0.5962 | 9.7468 | 303250 |
| Australia | 0.0004 | 0.0456 | -0.2496 | -0.0152 | 0.0000 | 0.0134 | 0.2968 | 0.4701 | 7.7619 | 5987837 |
| Austria | 0.0004 | 0.0215 | -0.1525 | -0.0079 | 0.0000 | 0.0084 | 0.1487 | 0.1370 | 9.2093 | 480517 |
| Belgium | 0.0004 | 0.0195 | -0.1161 | -0.0077 | 0.0000 | 0.0083 | 0.1354 | 0.1538 | 7.0578 | 881214 |
| Brazil | 0.0006 | 0.0326 | -0.4970 | -0.0137 | 0.0000 | 0.0136 | 3.1135 | 6.0719 | 436.6599 | 429527 |
| Canada | 0.0007 | 0.0448 | -0.3002 | -0.0143 | 0.0000 | 0.0133 | 0.4304 | 0.6967 | 10.8127 | 6759237 |
| Chile | 0.0010 | 0.0203 | -0.1053 | -0.0068 | 0.0000 | 0.0076 | 0.1645 | 0.5207 | 7.6504 | 583484 |
| China | 0.0007 | 0.0264 | -0.1257 | -0.0138 | 0.0000 | 0.0145 | 0.2191 | 0.1453 | 4.9022 | 6515048 |
| Colombia | 0.0011 | 0.0248 | -0.1587 | -0.0073 | 0.0002 | 0.0089 | 0.2055 | 0.2790 | 9.5015 | 125275 |
| Czech | -0.0002 | 0.0332 | -0.2070 | -0.0112 | 0.0003 | 0.0112 | 0.2652 | 0.1211 | 6.5522 | 279987 |
| Denmark | 0.0004 | 0.0243 | -0.1455 | -0.0092 | 0.0000 | 0.0095 | 0.1673 | 0.1688 | 8.0603 | 908504 |
| Egypt | 0.0005 | 0.0248 | -0.1340 | -0.0111 | 0.0000 | 0.0107 | 0.1568 | 0.2437 | 4.8108 | 443663 |
| Finland | 0.0004 | 0.0246 | -0.1252 | -0.0106 | 0.0000 | 0.0107 | 0.1392 | 0.2050 | 6.0013 | 628562 |
| France | 0.0004 | 0.0260 | -0.1476 | -0.0097 | 0.0000 | 0.0095 | 0.1764 | 0.2816 | 7.3180 | 4204021 |
| Germany | -0.0001 | 0.0354 | -0.2251 | -0.0131 | -0.0002 | 0.0116 | 0.2772 | 0.4523 | 10.0592 | 6049783 |
| Greece | 0.0003 | 0.0337 | -0.1950 | -0.0157 | -0.0005 | 0.0143 | 0.2016 | 0.2552 | 6.1928 | 1312320 |
| Hongkong | 0.0001 | 0.0321 | -0.1542 | -0.0143 | 0.0000 | 0.0120 | 0.2000 | 0.5643 | 6.9001 | 4470816 |
| Hungary | 0.0004 | 0.0345 | -0.2167 | -0.0124 | -0.0001 | 0.0118 | 0.2482 | 0.3908 | 8.7221 | 175230 |
| India | 0.0007 | 0.0422 | -0.2829 | -0.0175 | 0.0000 | 0.0155 | 0.4626 | 0.7217 | 10.6259 | 7082482 |
| Indonesia | 0.0010 | 0.0461 | -0.3331 | -0.0153 | 0.0000 | 0.0141 | 0.4807 | 0.8375 | 13.1321 | 1109800 |
| Ireland | 0.0004 | 0.0300 | -0.2047 | -0.0085 | 0.0001 | 0.0088 | 0.2700 | 0.3272 | 11.5944 | 259881 |
| Israel | 0.0003 | 0.0298 | -0.1586 | -0.0106 | 0.0000 | 0.0104 | 0.1650 | 0.1491 | 6.1521 | 2308090 |
| Italy | -0.0001 | 0.0208 | -0.0917 | -0.0109 | -0.0003 | 0.0098 | 0.1121 | 0.2585 | 4.9937 | 1598553 |
| Japan | 0.0000 | 0.0237 | -0.1077 | -0.0118 | -0.0004 | 0.0107 | 0.1328 | 0.3291 | 5.3681 | 15845027 |
| Luxembourg | 0.0006 | 0.0198 | -0.5039 | -0.0054 | 0.0001 | 0.0062 | 0.9947 | 2.3212 | 126.8163 | 109693 |
| Malaysia | 0.0002 | 0.0298 | -0.1884 | -0.0118 | 0.0000 | 0.0097 | 0.2500 | 0.5934 | 8.3696 | 3800489 |
| Mexico | 0.0008 | 0.0229 | -0.1399 | -0.0077 | 0.0002 | 0.0083 | 0.1872 | 0.2417 | 7.5392 | 496882 |
| Morocco | 0.0006 | 0.0202 | -0.0900 | -0.0068 | 0.0000 | 0.0074 | 0.3158 | 0.2402 | 6.4929 | 209558 |
| Netherlands | 0.0003 | 0.0213 | -0.1331 | -0.0091 | 0.0000 | 0.0091 | 0.1592 | 0.2560 | 7.5170 | 999981 |
| Newzealand | 0.0005 | 0.0276 | -0.2561 | -0.0097 | 0.0001 | 0.0102 | 0.2445 | 0.2317 | 9.7177 | 540378 |
| Norway | 0.0003 | 0.0314 | -0.1985 | -0.0133 | 0.0000 | 0.0128 | 0.2026 | 0.2398 | 6.7587 | 889716 |
| Pakistan | 0.0010 | 0.0378 | -0.2481 | -0.0127 | 0.0000 | 0.0125 | 0.3330 | 0.5590 | 9.9039 | 902587 |
| Peru | 0.0011 | 0.0253 | -0.4008 | -0.0019 | 0.0003 | 0.0027 | 0.7046 | 1.2073 | 28.0964 | 364892 |
| Philippines | 0.0007 | 0.0399 | -0.2471 | -0.0141 | 0.0000 | 0.0121 | 0.3060 | 0.7753 | 9.5651 | 715297 |
| Poland | 0.0000 | 0.0378 | -0.1987 | -0.0153 | -0.0003 | 0.0141 | 0.2426 | 0.3652 | 7.8719 | 1469074 |
| Portugal | 0.0002 | 0.0258 | -0.1762 | -0.0084 | 0.0000 | 0.0082 | 0.1966 | 0.2987 | 9.5115 | 432934 |
| Russia | 0.0000 | 0.0366 | -0.4342 | -0.0135 | -0.0002 | 0.0119 | 0.5063 | 0.5056 | 11.1839 | 406398 |
| Singapore | 0.0005 | 0.0355 | -0.2195 | -0.0121 | 0.0000 | 0.0104 | 0.3016 | 0.5744 | 9.5381 | 2359687 |
| Southafrica | 0.0006 | 0.0382 | -0.2618 | -0.0123 | 0.0000 | 0.0123 | 0.3359 | 0.4840 | 10.8264 | 1657060 |
| Southkorea | 0.0004 | 0.0365 | -0.1669 | -0.0168 | 0.0000 | 0.0152 | 0.1957 | 0.3782 | 6.0655 | 7958902 |
| Spain | 0.0001 | 0.0204 | -0.0994 | -0.0097 | 0.0000 | 0.0093 | 0.1005 | 0.2190 | 5.4704 | 872604 |
| Srilanka | 0.0010 | 0.0362 | -0.2528 | -0.0118 | 0.0000 | 0.0099 | 0.3584 | 0.7265 | 8.0590 | 788186 |
| Sweden | 0.0001 | 0.0338 | -0.2191 | -0.0136 | -0.0001 | 0.0125 | 0.2589 | 0.4086 | 8.4007 | 1861149 |
| Switzerland | 0.0003 | 0.0196 | -0.1124 | -0.0087 | 0.0000 | 0.0091 | 0.1215 | 0.1371 | 6.2510 | 1346882 |
| Taiwan | 0.0003 | 0.0262 | -0.1152 | -0.0127 | -0.0001 | 0.0115 | 0.1369 | 0.2452 | 4.0882 | 5610500 |
| Thailand | 0.0004 | 0.0304 | -0.2776 | -0.0110 | 0.0000 | 0.0100 | 0.2973 | 0.6589 | 13.9870 | 2351032 |
| Turkey | 0.0006 | 0.0358 | -0.1740 | -0.0175 | -0.0003 | 0.0166 | 0.1885 | 0.3262 | 5.3783 | 1616525 |
| Uk | -0.0002 | 0.0262 | -0.1711 | -0.0098 | -0.0001 | 0.0086 | 0.2175 | 0.3313 | 8.4235 | 7151246 |
| Usa | 0.0005 | 0.0287 | -0.1481 | -0.0115 | 0.0000 | 0.0114 | 0.1733 | 0.3209 | 6.7322 | 30550363 |
| Venezuela | 0.0021 | 0.0348 | -0.1948 | -0.0063 | 0.0002 | 0.0073 | 0.2332 | 0.8798 | 9.6305 | 74908 |
| Vietnam | 0.0000 | 0.0274 | -0.0678 | -0.0170 | 0.0000 | 0.0165 | 0.0682 | 0.0588 | 2.6353 | 423424 |
| All | 0.0004 | 0.0319 | -0.5039 | -0.0124 | 0.0000 | 0.0116 | 3.1135 | 0.5355 | 11.8493 | 144702455 |

|  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Panel B. Summary Statistics for Daily Market Value | | | | | | | | | | |
| **Countries** | **Mean** | **Std.Dev** | **Min** | **25-pct** | **Median** | **75-pct** | **Max** | **Skew** | **Kurt** | **Obs** |
| Argentina | 449.8 | 893.1 | 3.02 | 28.4 | 112.0 | 454.7 | 10409.0 | 4.9 | 37.5 | 289389 |
| Australia | 344.8 | 1057.6 | 1.13 | 9.9 | 33.8 | 161.2 | 11433.7 | 5.7 | 41.4 | 5862980 |
| Austria | 743.9 | 1562.1 | 3.21 | 50.6 | 172.0 | 649.9 | 12726.9 | 4.1 | 22.5 | 468168 |
| Belgium | 893.8 | 2232.1 | 2.10 | 37.7 | 129.8 | 593.0 | 19554.1 | 4.4 | 25.1 | 862136 |
| Brazil | 2345.3 | 4337.6 | 7.09 | 261.8 | 821.6 | 2318.1 | 40215.6 | 4.0 | 22.9 | 418956 |
| Canada | 449.0 | 1298.5 | 0.46 | 15.4 | 61.4 | 252.6 | 13693.7 | 5.6 | 40.5 | 6605539 |
| Chile | 1007.9 | 1992.0 | 1.23 | 69.1 | 256.7 | 974.4 | 14914.9 | 3.8 | 19.4 | 571086 |
| China | 740.2 | 1169.7 | 48.66 | 212.9 | 381.8 | 739.7 | 11931.2 | 4.6 | 30.8 | 6384747 |
| Colombia | 1813.1 | 3861.8 | 3.16 | 181.6 | 501.3 | 2044.3 | 56657.5 | 8.0 | 95.2 | 121316 |
| Czech | 298.5 | 1086.9 | 0.02 | 3.3 | 20.1 | 88.5 | 9871.9 | 5.6 | 36.6 | 268543 |
| Denmark | 535.7 | 1394.3 | 1.72 | 29.3 | 92.5 | 339.9 | 13851.3 | 5.1 | 34.1 | 888677 |
| Egypt | 329.0 | 651.6 | 1.04 | 25.0 | 74.9 | 326.5 | 5062.3 | 3.7 | 18.7 | 428738 |
| Finland | 821.6 | 1967.6 | 4.15 | 49.2 | 178.8 | 663.9 | 20269.5 | 5.1 | 35.5 | 615826 |
| France | 1190.8 | 3851.1 | 1.94 | 30.6 | 108.9 | 491.2 | 40646.9 | 5.9 | 43.6 | 4117377 |
| Germany | 1299.7 | 4321.1 | 0.36 | 26.0 | 96.9 | 485.5 | 45559.1 | 5.9 | 43.1 | 5913345 |
| Greece | 240.9 | 619.2 | 2.32 | 19.8 | 53.1 | 173.2 | 6592.1 | 5.6 | 40.5 | 1284547 |
| Hongkong | 683.3 | 1918.2 | 4.87 | 41.3 | 109.4 | 388.4 | 19747.5 | 5.5 | 38.9 | 4381116 |
| Hungary | 451.0 | 1302.2 | 0.50 | 9.3 | 42.3 | 166.7 | 9984.7 | 4.3 | 22.7 | 171726 |
| India | 262.9 | 812.9 | 0.29 | 7.5 | 29.2 | 130.4 | 8864.8 | 5.9 | 44.0 | 6535409 |
| Indonesia | 494.0 | 1201.9 | 1.31 | 20.6 | 78.9 | 344.1 | 11412.6 | 4.5 | 27.6 | 1087604 |
| Ireland | 946.3 | 2111.5 | 2.82 | 53.5 | 163.6 | 657.6 | 15412.4 | 3.8 | 19.0 | 254684 |
| Israel | 133.0 | 331.4 | 1.08 | 9.9 | 26.4 | 87.8 | 3060.1 | 4.8 | 30.3 | 2253051 |
| Italy | 1302.5 | 3476.4 | 8.27 | 81.4 | 228.7 | 858.6 | 37539.2 | 5.6 | 41.3 | 1565775 |
| Japan | 1048.2 | 2340.8 | 11.15 | 93.8 | 257.4 | 829.7 | 21364.5 | 4.5 | 27.2 | 15526433 |
| Luxembourg | 777.5 | 1341.0 | 2.14 | 52.3 | 324.9 | 790.6 | 9679.1 | 3.4 | 16.7 | 105577 |
| Malaysia | 236.7 | 610.9 | 3.88 | 22.4 | 55.5 | 175.9 | 6787.1 | 5.9 | 45.9 | 3724479 |
| Mexico | 1697.3 | 3265.1 | 4.86 | 147.9 | 504.6 | 1642.7 | 26009.4 | 3.7 | 19.1 | 485456 |
| Morocco | 632.5 | 1249.4 | 2.70 | 39.8 | 171.3 | 654.8 | 10516.0 | 4.0 | 22.2 | 205349 |
| Netherlands | 2066.9 | 6051.6 | 1.75 | 45.8 | 194.3 | 917.3 | 53548.9 | 4.9 | 30.4 | 973807 |
| Newzealand | 277.6 | 544.5 | 1.49 | 24.0 | 73.8 | 245.4 | 4162.8 | 3.7 | 19.0 | 529469 |
| Norway | 588.6 | 1579.9 | 3.01 | 44.6 | 133.1 | 435.9 | 17239.4 | 6.0 | 46.2 | 871802 |
| Pakistan | 107.1 | 245.4 | 0.13 | 5.3 | 22.0 | 88.5 | 2496.4 | 4.7 | 31.4 | 881273 |
| Peru | 327.5 | 688.7 | 0.21 | 8.2 | 41.6 | 279.8 | 4957.0 | 3.4 | 15.7 | 356002 |
| Philippines | 450.2 | 966.6 | 0.02 | 18.4 | 70.2 | 328.4 | 6996.9 | 3.5 | 17.0 | 700971 |
| Poland | 193.4 | 619.3 | 0.37 | 6.8 | 24.1 | 98.2 | 7219.8 | 6.5 | 53.5 | 1438578 |
| Portugal | 734.3 | 1790.4 | 1.00 | 24.1 | 88.2 | 442.3 | 12663.1 | 4.0 | 20.2 | 396298 |
| Russia | 3315.9 | 8587.6 | 2.42 | 66.1 | 407.8 | 1892.4 | 74489.6 | 4.6 | 27.4 | 398270 |
| Singapore | 475.4 | 1306.5 | 5.51 | 33.0 | 83.0 | 277.0 | 13132.7 | 5.3 | 36.7 | 2312428 |
| Southafrica | 735.8 | 1632.2 | 0.87 | 27.2 | 133.1 | 626.7 | 13983.4 | 4.2 | 24.3 | 1608638 |
| Southkorea | 202.6 | 608.1 | 2.34 | 20.0 | 44.8 | 118.3 | 7095.7 | 6.4 | 52.2 | 7799330 |
| Spain | 2479.9 | 6147.5 | 9.09 | 146.3 | 487.9 | 1820.1 | 57096.7 | 4.9 | 31.6 | 845691 |
| Srilanka | 33.2 | 70.6 | 0.35 | 3.7 | 9.8 | 28.2 | 640.6 | 4.6 | 29.2 | 772128 |
| Sweden | 643.8 | 1873.0 | 0.83 | 19.4 | 68.8 | 322.7 | 19280.2 | 5.4 | 38.5 | 1822242 |
| Switzerland | 2320.4 | 7641.1 | 7.68 | 108.4 | 335.5 | 1112.0 | 80984.6 | 6.1 | 46.1 | 1312538 |
| Taiwan | 341.4 | 769.0 | 5.23 | 39.6 | 103.1 | 281.4 | 7745.0 | 5.1 | 34.7 | 5498228 |
| Thailand | 241.2 | 604.0 | 2.03 | 20.9 | 53.4 | 170.6 | 6421.3 | 5.3 | 36.9 | 2303202 |
| Turkey | 315.1 | 882.6 | 1.17 | 16.1 | 51.4 | 192.4 | 8876.4 | 5.5 | 38.4 | 1584110 |
| Uk | 1153.5 | 3360.6 | 2.24 | 34.6 | 130.4 | 618.1 | 37746.5 | 5.6 | 42.0 | 6997371 |
| Usa | 2475.3 | 12963.2 | 4.50 | 66.1 | 237.1 | 1009.5 | 697915.8 | 16.4 | 394.2 | 30085219 |
| Venezuela | 385.7 | 699.6 | 1.65 | 40.6 | 153.6 | 455.8 | 8114.9 | 5.2 | 42.5 | 71792 |
| Vietnam | 90.6 | 258.9 | 1.70 | 8.4 | 18.7 | 48.8 | 2650.8 | 5.7 | 42.5 | 414955 |
| All | 1087.7 | 6401.9 | 0.02 | 33.3 | 123.3 | 498.6 | 697915.8 | 29.9 | 1438.0 | 141372371 |

**Table 4**

Almost Dominance around the World

Cumulative distributions of all securities in 51 countries are examined in comparison to 7 separate indices at daily, monthly, semi-annually, and annually investment horizon frequencies. 7 indices are World, World excluding EMU, World excluding US, Developed, Emerging, EMU only and 51 country indices. For each horizon and comparison an is estimated. Specifically, we define as the area between the cumulative distributions when the cumulative distribution of the stock plots above the cumulative distribution of the index it is compared to (V in Figure 1). Similarly, we define as the area between the cumulative distributions when the cumulative distribution of the index plots above the cumulative distribution of the stock (K in Figure 1). is defined as . Panel A and C reports summary statistics of epsilon values obtained for each stock, at each horizon. Panel B and D reports the number and percentage of securities that have values lower than the critical level (i.e., number and percentage of dominant securities). Panel A and B uses the full sample for each security. Panel C and D uses the sample up to 2008.

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| Panel A. Distributions of Epsilons (Full Sample) | | | | | | | |
|  | Horizon | Min | 1% | Median | 99% | Max | Obs |
| **World** | Day | 0.013 | 0.388 | 0.495 | 0.617 | 0.885 | 49939 |
| Month | 0.000 | 0.087 | 0.487 | 0.907 | 1.000 | 49939 |
| Semi-Annual | 0.000 | 0.000 | 0.457 | 1.000 | 1.000 | 49939 |
| Annual | 0.000 | 0.000 | 0.446 | 1.000 | 1.000 | 49939 |
| **World-ex-Emu** | Day | 0.007 | 0.388 | 0.495 | 0.615 | 0.873 | 49939 |
| Month | 0.000 | 0.087 | 0.486 | 0.901 | 1.000 | 49939 |
| Semi-Annual | 0.000 | 0.000 | 0.454 | 1.000 | 1.000 | 49939 |
| Annual | 0.000 | 0.000 | 0.440 | 1.000 | 1.000 | 49939 |
| **World-ex-Usa** | Day | 0.012 | 0.371 | 0.493 | 0.620 | 0.887 | 49939 |
| Month | 0.000 | 0.049 | 0.477 | 0.909 | 1.000 | 49939 |
| Semi-Annual | 0.000 | 0.000 | 0.437 | 1.000 | 1.000 | 49939 |
| Annual | 0.000 | 0.000 | 0.420 | 1.000 | 1.000 | 49939 |
| **Developed** | Day | 0.003 | 0.386 | 0.495 | 0.618 | 0.862 | 49939 |
| Month | 0.000 | 0.088 | 0.488 | 0.904 | 1.000 | 49939 |
| Semi-Annual | 0.000 | 0.000 | 0.456 | 1.000 | 1.000 | 49939 |
| Annual | 0.000 | 0.000 | 0.447 | 1.000 | 1.000 | 49939 |
| **Emerging** | Day | 0.001 | 0.356 | 0.495 | 0.627 | 0.928 | 46622 |
| Month | 0.000 | 0.042 | 0.664 | 1.000 | 1.000 | 46622 |
| Semi-Annual | 0.000 | 0.000 | 0.796 | 1.000 | 1.000 | 46622 |
| Annual | 0.000 | 0.000 | 0.860 | 1.000 | 1.000 | 46622 |
| **Europe-Emu-Only** | Day | 0.027 | 0.334 | 0.497 | 0.652 | 0.969 | 49939 |
| Month | 0.000 | 0.032 | 0.495 | 0.940 | 1.000 | 49939 |
| Semi-Annual | 0.000 | 0.000 | 0.477 | 1.000 | 1.000 | 49939 |
| Annual | 0.000 | 0.000 | 0.478 | 1.000 | 1.000 | 49939 |
| **Country Index** | Day | 0.034 | 0.373 | 0.498 | 0.621 | 0.989 | 49939 |
| Month | 0.000 | 0.034 | 0.507 | 0.941 | 1.000 | 49939 |
| Semi-Annual | 0.000 | 0.000 | 0.528 | 1.000 | 1.000 | 49939 |
| Annual | 0.000 | 0.000 | 0.555 | 1.000 | 1.000 | 49939 |

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Panel B. Percentage of Dominant Equities (Full sample) | | | | |
|  | **Horizon** | **Obs** | **Dominant** | **Percentage** |
| **World** | Day | 49939 | 3 | 0.000 |
| Month | 49939 | 348 | 0.007 |
| Semi-Annual | 49939 | 2544 | 0.051 |
| Annual | 49939 | 5024 | 0.101 |
| **World-ex-Emu** | Day | 49939 | 2 | 0.000 |
| Month | 49939 | 349 | 0.007 |
| Semi-Annual | 49939 | 2519 | 0.050 |
| Annual | 49939 | 5032 | 0.101 |
| **World-ex-Usa** | Day | 49939 | 3 | 0.000 |
| Month | 49939 | 564 | 0.011 |
| Semi-Annual | 49939 | 3533 | 0.071 |
| Annual | 49939 | 6375 | 0.128 |
| **Developed** | Day | 49939 | 2 | 0.000 |
| Month | 49939 | 341 | 0.007 |
| Semi-Annual | 49939 | 2504 | 0.050 |
| Annual | 49939 | 4972 | 0.100 |
| **Emerging** | Day | 46622 | 9 | 0.000 |
| Month | 46622 | 576 | 0.012 |
| Semi-Annual | 46622 | 2299 | 0.049 |
| Annual | 46622 | 3659 | 0.078 |
| **Europe-Emu-Only** | Day | 49939 | 6 | 0.000 |
| Month | 49939 | 728 | 0.015 |
| Semi-Annual | 49939 | 3765 | 0.075 |
| Annual | 49939 | 5920 | 0.119 |
| **Country Index** | Day | 49939 | 3 | 0.000 |
| Month | 49939 | 761 | 0.015 |
| Semi-Annual | 49939 | 4137 | 0.083 |
| Annual | 49939 | 6399 | 0.128 |

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| Panel C. Distributions of Epsilons (Early Sample) | | | | | | | |
|  | Horizon | Min | 1% | Median | 99% | Max | Obs |
| **World** | Day | 0.001 | 0.379 | 0.495 | 0.617 | 0.957 | 41637 |
| Month | 0.000 | 0.066 | 0.486 | 0.895 | 1.000 | 41637 |
| Semi-Annual | 0.000 | 0.000 | 0.453 | 1.000 | 1.000 | 41637 |
| Annual | 0.000 | 0.000 | 0.438 | 1.000 | 1.000 | 41637 |
| **World-ex-Emu** | Day | 0.001 | 0.375 | 0.494 | 0.616 | 0.955 | 41637 |
| Month | 0.000 | 0.064 | 0.484 | 0.894 | 1.000 | 41637 |
| Semi-Annual | 0.000 | 0.000 | 0.445 | 1.000 | 1.000 | 41637 |
| Annual | 0.000 | 0.000 | 0.425 | 1.000 | 1.000 | 41637 |
| **World-ex-Usa** | Day | 0.002 | 0.364 | 0.494 | 0.626 | 0.940 | 41637 |
| Month | 0.000 | 0.036 | 0.482 | 0.910 | 1.000 | 41637 |
| Semi-Annual | 0.000 | 0.000 | 0.446 | 1.000 | 1.000 | 41637 |
| Annual | 0.000 | 0.000 | 0.429 | 1.000 | 1.000 | 41637 |
| **Developed** | Day | 0.001 | 0.377 | 0.495 | 0.617 | 0.967 | 41637 |
| Month | 0.000 | 0.071 | 0.485 | 0.892 | 1.000 | 41637 |
| Semi-Annual | 0.000 | 0.000 | 0.450 | 1.000 | 1.000 | 41637 |
| Annual | 0.000 | 0.000 | 0.429 | 1.000 | 1.000 | 41637 |
| **Emerging** | Day | 0.001 | 0.350 | 0.496 | 0.647 | 0.928 | 38285 |
| Month | 0.000 | 0.055 | 0.778 | 1.000 | 1.000 | 38285 |
| Semi-Annual | 0.000 | 0.000 | 0.911 | 1.000 | 1.000 | 38285 |
| Annual | 0.000 | 0.000 | 0.956 | 1.000 | 1.000 | 38285 |
| **Europe-Emu-Only** | Day | 0.012 | 0.361 | 0.500 | 0.643 | 0.889 | 41637 |
| Month | 0.000 | 0.058 | 0.509 | 0.928 | 1.000 | 41637 |
| Semi-Annual | 0.000 | 0.000 | 0.508 | 1.000 | 1.000 | 41637 |
| Annual | 0.000 | 0.000 | 0.518 | 1.000 | 1.000 | 41637 |
| **Country Index** | Day | 0.010 | 0.364 | 0.498 | 0.620 | 0.989 | 41637 |
| Month | 0.000 | 0.022 | 0.510 | 0.939 | 1.000 | 41637 |
| Semi-Annual | 0.000 | 0.000 | 0.540 | 1.000 | 1.000 | 41637 |
| Annual | 0.000 | 0.000 | 0.579 | 1.000 | 1.000 | 41637 |

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| --- | --- | --- | --- | --- |
| Panel D. Percentage of Dominant Equities (Early sample) | | | | |
|  | **Horizon** | **Obs** | **Dominant** | **Percentage** |
| **World** | Day | 41637 | 4 | 0.000 |
| Month | 41637 | 383 | 0.009 |
| Semi-Annual | 41637 | 2453 | 0.059 |
| Annual | 41637 | 4716 | 0.113 |
| **World-ex-Emu** | Day | 41637 | 3 | 0.000 |
| Month | 41637 | 384 | 0.009 |
| Semi-Annual | 41637 | 2568 | 0.062 |
| Annual | 41637 | 4961 | 0.119 |
| **World-ex-Usa** | Day | 41637 | 5 | 0.000 |
| Month | 41637 | 567 | 0.014 |
| Semi-Annual | 41637 | 3070 | 0.074 |
| Annual | 41637 | 5419 | 0.130 |
| **Developed** | Day | 41637 | 3 | 0.000 |
| Month | 41637 | 361 | 0.009 |
| Semi-Annual | 41637 | 2414 | 0.058 |
| Annual | 41637 | 4778 | 0.115 |
| **Emerging** | Day | 38285 | 11 | 0.000 |
| Month | 38285 | 401 | 0.010 |
| Semi-Annual | 38285 | 1380 | 0.036 |
| Annual | 38285 | 2031 | 0.053 |
| **Europe-Emu-Only** | Day | 41637 | 6 | 0.000 |
| Month | 41637 | 417 | 0.010 |
| Semi-Annual | 41637 | 2334 | 0.056 |
| Annual | 41637 | 4195 | 0.101 |
| **Country Index** | Day | 41637 | 8 | 0.000 |
| Month | 41637 | 756 | 0.018 |
| Semi-Annual | 41637 | 3507 | 0.084 |
| Annual | 41637 | 5236 | 0.126 |

**Table 5**

Dominant Securities

Cumulative distributions of all securities in 51 countries are examined in comparison to separate indices at monthly, semi-annually, and annually investment horizon frequencies. Estimated epsilons are used to determine dominant securities in each country. To estimate values, we define as the area between the cumulative distributions when the cumulative distribution of the stock plots above the cumulative distribution of the index it is compared to (V in Figure 1). Similarly, we define as the area between the cumulative distributions when the cumulative distribution of the index plots above the cumulative distribution of the stock (K in Figure 1). is defined as . Panel A and C reports, in each country, the number of securities that dominate the World, World excluding US, Emerging and Country indices at 1-month, 6-month, and 12-month investment horizons. Panel B and D reports the corresponding percentages of the dominant securities. Panel A and B uses the full sample for each security. Panel C and D uses the sample up to 2008. Light grey rows shows results for European Monetary Union countries: Austria, Belgium, Finland, France, Germany, Greece, Ireland, Italy, Netherlands, Portugal, and Spain. Dark grey rows are additional three countries which are in EU both not in EMU: Denmark, Sweden, and UK as of 2014.

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| Panel A. Dominant Securities (Full Sample) | | | | | | | | | | | | | | | |
|  | World | | |  | World-ex-Usa | | |  | Emerging | | |  | Country Index | | |
| **Countries** | Month | Semi. Ann | Annual |  | Month | Semi. Ann | Annual |  | Month | Semi. Ann | Annual |  | Month | Semi. Ann | Annual |
| Argentina | 0 | 6 | 15 |  | 0 | 6 | 16 |  | 0 | 1 | 3 |  | 0 | 4 | 7 |
| Australia | 13 | 122 | 235 |  | 20 | 154 | 295 |  | 25 | 96 | 168 |  | 54 | 132 | 226 |
| Austria | 3 | 12 | 23 |  | 5 | 20 | 30 |  | 3 | 8 | 10 |  | 1 | 10 | 15 |
| Belgium | 3 | 49 | 71 |  | 16 | 60 | 83 |  | 6 | 14 | 20 |  | 3 | 36 | 49 |
| Brazil | 0 | 12 | 29 |  | 0 | 15 | 33 |  | 0 | 15 | 33 |  | 10 | 37 | 45 |
| Canada | 27 | 144 | 278 |  | 36 | 184 | 343 |  | 32 | 108 | 182 |  | 36 | 109 | 165 |
| Chile | 8 | 31 | 48 |  | 12 | 41 | 67 |  | 3 | 8 | 12 |  | 3 | 19 | 26 |
| China | 0 | 135 | 263 |  | 0 | 188 | 342 |  | 7 | 302 | 450 |  | 19 | 216 | 352 |
| Colombia | 3 | 10 | 13 |  | 3 | 13 | 15 |  | 4 | 9 | 11 |  | 3 | 8 | 11 |
| Czech | 1 | 2 | 6 |  | 0 | 2 | 8 |  | 0 | 3 | 7 |  | 2 | 34 | 52 |
| Denmark | 2 | 23 | 38 |  | 4 | 34 | 49 |  | 2 | 8 | 14 |  | 6 | 36 | 52 |
| Egypt | 2 | 8 | 12 |  | 2 | 6 | 13 |  | 2 | 6 | 12 |  | 2 | 13 | 14 |
| Finland | 0 | 11 | 19 |  | 0 | 14 | 28 |  | 3 | 9 | 16 |  | 0 | 14 | 22 |
| France | 22 | 179 | 279 |  | 42 | 233 | 353 |  | 34 | 106 | 140 |  | 15 | 165 | 233 |
| Germany | 25 | 120 | 193 |  | 33 | 162 | 247 |  | 21 | 68 | 109 |  | 81 | 405 | 505 |
| Greece | 1 | 5 | 16 |  | 1 | 3 | 14 |  | 1 | 2 | 7 |  | 2 | 16 | 36 |
| Hongkong | 2 | 29 | 78 |  | 7 | 39 | 116 |  | 4 | 41 | 95 |  | 22 | 171 | 284 |
| Hungary | 0 | 4 | 9 |  | 0 | 6 | 9 |  | 1 | 4 | 6 |  | 2 | 7 | 10 |
| India | 1 | 31 | 99 |  | 1 | 40 | 117 |  | 2 | 33 | 70 |  | 27 | 131 | 219 |
| Indonesia | 0 | 35 | 76 |  | 0 | 39 | 84 |  | 4 | 30 | 58 |  | 8 | 38 | 60 |
| Ireland | 0 | 5 | 11 |  | 2 | 11 | 17 |  | 0 | 2 | 2 |  | 1 | 9 | 15 |
| Israel | 0 | 6 | 35 |  | 0 | 12 | 48 |  | 0 | 22 | 38 |  | 15 | 67 | 111 |
| Italy | 5 | 21 | 35 |  | 6 | 28 | 50 |  | 2 | 10 | 18 |  | 29 | 105 | 160 |
| Japan | 4 | 55 | 107 |  | 9 | 72 | 130 |  | 24 | 66 | 102 |  | 28 | 263 | 432 |
| Luxembourg | 2 | 4 | 6 |  | 3 | 5 | 10 |  | 1 | 2 | 2 |  | 1 | 1 | 3 |
| Malaysia | 11 | 41 | 70 |  | 11 | 52 | 85 |  | 13 | 50 | 65 |  | 22 | 103 | 127 |
| Mexico | 5 | 25 | 40 |  | 5 | 29 | 48 |  | 5 | 14 | 21 |  | 5 | 19 | 30 |
| Morocco | 3 | 13 | 21 |  | 3 | 15 | 25 |  | 8 | 16 | 19 |  | 0 | 3 | 12 |
| Netherlands | 6 | 26 | 46 |  | 10 | 39 | 67 |  | 1 | 7 | 10 |  | 6 | 38 | 50 |
| Newzealand | 7 | 22 | 41 |  | 6 | 28 | 49 |  | 3 | 12 | 19 |  | 6 | 20 | 27 |
| Norway | 3 | 26 | 59 |  | 5 | 36 | 65 |  | 6 | 28 | 41 |  | 14 | 63 | 73 |
| Pakistan | 1 | 32 | 61 |  | 1 | 37 | 67 |  | 1 | 28 | 48 |  | 2 | 23 | 38 |
| Peru | 6 | 27 | 50 |  | 6 | 36 | 56 |  | 6 | 20 | 33 |  | 2 | 9 | 15 |
| Philippines | 1 | 15 | 33 |  | 2 | 18 | 36 |  | 5 | 20 | 33 |  | 4 | 26 | 37 |
| Poland | 0 | 15 | 47 |  | 0 | 20 | 54 |  | 1 | 19 | 63 |  | 13 | 80 | 142 |
| Portugal | 2 | 7 | 13 |  | 2 | 9 | 17 |  | 1 | 6 | 6 |  | 0 | 12 | 19 |
| Russia | 1 | 8 | 16 |  | 1 | 10 | 20 |  | 2 | 11 | 22 |  | 6 | 35 | 46 |
| Singapore | 8 | 47 | 94 |  | 13 | 62 | 105 |  | 15 | 57 | 75 |  | 19 | 54 | 80 |
| Southafrica | 1 | 37 | 75 |  | 1 | 57 | 95 |  | 2 | 27 | 39 |  | 5 | 45 | 67 |
| Southkorea | 10 | 37 | 116 |  | 9 | 47 | 130 |  | 6 | 52 | 133 |  | 14 | 65 | 142 |
| Spain | 5 | 18 | 27 |  | 2 | 23 | 32 |  | 4 | 11 | 11 |  | 9 | 49 | 65 |
| Srilanka | 0 | 14 | 38 |  | 0 | 21 | 41 |  | 0 | 8 | 17 |  | 0 | 17 | 27 |
| Sweden | 4 | 36 | 86 |  | 6 | 48 | 103 |  | 11 | 36 | 60 |  | 27 | 115 | 152 |
| Switzerland | 9 | 30 | 48 |  | 14 | 44 | 66 |  | 3 | 14 | 20 |  | 5 | 33 | 50 |
| Taiwan | 2 | 35 | 92 |  | 5 | 55 | 119 |  | 12 | 59 | 115 |  | 15 | 83 | 166 |
| Thailand | 12 | 43 | 82 |  | 16 | 56 | 101 |  | 22 | 49 | 75 |  | 15 | 64 | 99 |
| Turkey | 0 | 5 | 19 |  | 0 | 7 | 20 |  | 0 | 8 | 19 |  | 8 | 31 | 51 |
| Uk | 13 | 173 | 388 |  | 20 | 265 | 481 |  | 30 | 116 | 191 |  | 145 | 690 | 947 |
| Usa | 110 | 726 | 1430 |  | 217 | 1100 | 1932 |  | 227 | 621 | 889 |  | 37 | 369 | 771 |
| Venezuela | 4 | 9 | 12 |  | 5 | 9 | 11 |  | 4 | 8 | 9 |  | 0 | 1 | 2 |
| Vietnam | 0 | 18 | 26 |  | 2 | 23 | 33 |  | 7 | 29 | 41 |  | 12 | 44 | 60 |

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| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Panel B. Dominant Security Percentages (Full Sample) | | | | | | | | | | | | | | | |
|  | World | | |  | World-ex-Usa | | |  | Emerging | | |  | Country Index | | | |
| **Countries** | Month | Semi. Ann | Annual |  | Month | Semi. Ann | Annual |  | Month | Semi. Ann | Annual |  | Month | Semi. Ann | Annual | |
| Argentina | 0.000 | 0.062 | 0.155 |  | 0.000 | 0.062 | 0.165 |  | 0.000 | 0.011 | 0.034 |  | 0.000 | 0.041 | 0.072 | |
| Australia | 0.005 | 0.048 | 0.093 |  | 0.008 | 0.061 | 0.116 |  | 0.010 | 0.040 | 0.070 |  | 0.021 | 0.052 | 0.089 | |
| Austria | 0.016 | 0.063 | 0.120 |  | 0.026 | 0.105 | 0.157 |  | 0.019 | 0.051 | 0.064 |  | 0.005 | 0.052 | 0.079 | |
| Belgium | 0.010 | 0.162 | 0.234 |  | 0.053 | 0.198 | 0.274 |  | 0.024 | 0.056 | 0.079 |  | 0.010 | 0.119 | 0.162 | |
| Brazil | 0.000 | 0.057 | 0.139 |  | 0.000 | 0.072 | 0.158 |  | 0.000 | 0.072 | 0.159 |  | 0.048 | 0.177 | 0.215 | |
| Canada | 0.010 | 0.055 | 0.106 |  | 0.014 | 0.070 | 0.131 |  | 0.014 | 0.047 | 0.080 |  | 0.014 | 0.042 | 0.063 | |
| Chile | 0.039 | 0.152 | 0.235 |  | 0.059 | 0.201 | 0.328 |  | 0.016 | 0.043 | 0.065 |  | 0.015 | 0.093 | 0.127 | |
| China | 0.000 | 0.054 | 0.105 |  | 0.000 | 0.075 | 0.136 |  | 0.003 | 0.120 | 0.179 |  | 0.008 | 0.086 | 0.140 | |
| Colombia | 0.060 | 0.200 | 0.260 |  | 0.060 | 0.260 | 0.300 |  | 0.085 | 0.191 | 0.234 |  | 0.060 | 0.160 | 0.220 | |
| Czech | 0.005 | 0.009 | 0.028 |  | 0.000 | 0.009 | 0.037 |  | 0.000 | 0.015 | 0.035 |  | 0.009 | 0.157 | 0.240 | |
| Denmark | 0.006 | 0.073 | 0.120 |  | 0.013 | 0.108 | 0.155 |  | 0.007 | 0.028 | 0.049 |  | 0.019 | 0.114 | 0.165 | |
| Egypt | 0.013 | 0.050 | 0.075 |  | 0.013 | 0.038 | 0.081 |  | 0.013 | 0.038 | 0.075 |  | 0.013 | 0.081 | 0.088 | |
| Finland | 0.000 | 0.057 | 0.098 |  | 0.000 | 0.072 | 0.144 |  | 0.017 | 0.050 | 0.088 |  | 0.000 | 0.072 | 0.113 | |
| France | 0.014 | 0.115 | 0.180 |  | 0.027 | 0.150 | 0.228 |  | 0.026 | 0.081 | 0.107 |  | 0.010 | 0.106 | 0.150 | |
| Germany | 0.011 | 0.053 | 0.086 |  | 0.015 | 0.072 | 0.110 |  | 0.010 | 0.031 | 0.050 |  | 0.036 | 0.180 | 0.225 | |
| Greece | 0.003 | 0.013 | 0.042 |  | 0.003 | 0.008 | 0.037 |  | 0.003 | 0.005 | 0.019 |  | 0.005 | 0.042 | 0.094 | |
| Hongkong | 0.001 | 0.020 | 0.055 |  | 0.005 | 0.027 | 0.081 |  | 0.003 | 0.029 | 0.067 |  | 0.015 | 0.119 | 0.198 | |
| Hungary | 0.000 | 0.053 | 0.118 |  | 0.000 | 0.079 | 0.118 |  | 0.014 | 0.058 | 0.087 |  | 0.026 | 0.092 | 0.132 | |
| India | 0.000 | 0.013 | 0.040 |  | 0.000 | 0.016 | 0.047 |  | 0.001 | 0.015 | 0.031 |  | 0.011 | 0.053 | 0.088 | |
| Indonesia | 0.000 | 0.075 | 0.162 |  | 0.000 | 0.083 | 0.179 |  | 0.009 | 0.065 | 0.126 |  | 0.017 | 0.081 | 0.128 | |
| Ireland | 0.000 | 0.053 | 0.116 |  | 0.021 | 0.116 | 0.179 |  | 0.000 | 0.029 | 0.029 |  | 0.011 | 0.095 | 0.158 | |
| Israel | 0.000 | 0.008 | 0.044 |  | 0.000 | 0.015 | 0.060 |  | 0.000 | 0.028 | 0.048 |  | 0.019 | 0.084 | 0.140 | |
| Italy | 0.010 | 0.040 | 0.067 |  | 0.011 | 0.054 | 0.096 |  | 0.005 | 0.023 | 0.041 |  | 0.055 | 0.201 | 0.306 | |
| Japan | 0.001 | 0.016 | 0.031 |  | 0.003 | 0.021 | 0.037 |  | 0.007 | 0.019 | 0.030 |  | 0.008 | 0.076 | 0.124 | |
| Luxembourg | 0.044 | 0.089 | 0.133 |  | 0.067 | 0.111 | 0.222 |  | 0.024 | 0.049 | 0.049 |  | 0.022 | 0.022 | 0.067 | |
| Malaysia | 0.011 | 0.039 | 0.067 |  | 0.011 | 0.050 | 0.082 |  | 0.013 | 0.048 | 0.063 |  | 0.021 | 0.099 | 0.122 | |
| Mexico | 0.029 | 0.143 | 0.229 |  | 0.029 | 0.166 | 0.274 |  | 0.033 | 0.092 | 0.137 |  | 0.029 | 0.109 | 0.171 | |
| Morocco | 0.034 | 0.148 | 0.239 |  | 0.034 | 0.170 | 0.284 |  | 0.091 | 0.182 | 0.216 |  | 0.000 | 0.034 | 0.136 | |
| Netherlands | 0.020 | 0.086 | 0.152 |  | 0.033 | 0.129 | 0.221 |  | 0.004 | 0.028 | 0.041 |  | 0.020 | 0.125 | 0.165 | |
| Newzealand | 0.032 | 0.100 | 0.187 |  | 0.027 | 0.128 | 0.224 |  | 0.017 | 0.067 | 0.106 |  | 0.027 | 0.091 | 0.123 | |
| Norway | 0.008 | 0.066 | 0.150 |  | 0.013 | 0.092 | 0.165 |  | 0.017 | 0.079 | 0.116 |  | 0.036 | 0.160 | 0.186 | |
| Pakistan | 0.003 | 0.098 | 0.187 |  | 0.003 | 0.113 | 0.205 |  | 0.003 | 0.089 | 0.152 |  | 0.006 | 0.070 | 0.116 | |
| Peru | 0.041 | 0.186 | 0.345 |  | 0.041 | 0.248 | 0.386 |  | 0.045 | 0.149 | 0.246 |  | 0.014 | 0.062 | 0.103 | |
| Philippines | 0.004 | 0.060 | 0.131 |  | 0.008 | 0.072 | 0.143 |  | 0.020 | 0.081 | 0.133 |  | 0.016 | 0.104 | 0.147 | |
| Poland | 0.000 | 0.019 | 0.061 |  | 0.000 | 0.026 | 0.070 |  | 0.001 | 0.025 | 0.081 |  | 0.017 | 0.103 | 0.183 | |
| Portugal | 0.012 | 0.041 | 0.076 |  | 0.012 | 0.053 | 0.099 |  | 0.008 | 0.049 | 0.049 |  | 0.000 | 0.070 | 0.111 | |
| Russia | 0.004 | 0.032 | 0.064 |  | 0.004 | 0.040 | 0.080 |  | 0.008 | 0.044 | 0.088 |  | 0.024 | 0.139 | 0.183 | |
| Singapore | 0.009 | 0.054 | 0.107 |  | 0.015 | 0.071 | 0.120 |  | 0.017 | 0.066 | 0.086 |  | 0.022 | 0.062 | 0.091 | |
| Southafrica | 0.001 | 0.050 | 0.101 |  | 0.001 | 0.076 | 0.127 |  | 0.003 | 0.039 | 0.057 |  | 0.007 | 0.060 | 0.090 | |
| Southkorea | 0.004 | 0.015 | 0.047 |  | 0.004 | 0.019 | 0.053 |  | 0.002 | 0.022 | 0.055 |  | 0.006 | 0.026 | 0.058 | |
| Spain | 0.019 | 0.067 | 0.101 |  | 0.007 | 0.086 | 0.120 |  | 0.016 | 0.044 | 0.044 |  | 0.034 | 0.184 | 0.243 | |
| Srilanka | 0.000 | 0.050 | 0.137 |  | 0.000 | 0.076 | 0.147 |  | 0.000 | 0.030 | 0.063 |  | 0.000 | 0.061 | 0.097 | |
| Sweden | 0.005 | 0.048 | 0.114 |  | 0.008 | 0.064 | 0.137 |  | 0.017 | 0.056 | 0.093 |  | 0.036 | 0.153 | 0.202 | |
| Switzerland | 0.023 | 0.076 | 0.122 |  | 0.036 | 0.112 | 0.168 |  | 0.009 | 0.041 | 0.059 |  | 0.013 | 0.084 | 0.127 | |
| Taiwan | 0.001 | 0.018 | 0.048 |  | 0.003 | 0.029 | 0.063 |  | 0.006 | 0.031 | 0.061 |  | 0.008 | 0.044 | 0.087 | |
| Thailand | 0.016 | 0.057 | 0.108 |  | 0.021 | 0.074 | 0.133 |  | 0.030 | 0.068 | 0.103 |  | 0.020 | 0.085 | 0.131 | |
| Turkey | 0.000 | 0.011 | 0.042 |  | 0.000 | 0.015 | 0.044 |  | 0.000 | 0.018 | 0.043 |  | 0.018 | 0.068 | 0.112 | |
| Uk | 0.004 | 0.052 | 0.118 |  | 0.006 | 0.080 | 0.146 |  | 0.011 | 0.043 | 0.070 |  | 0.044 | 0.209 | 0.287 | |
| Usa | 0.011 | 0.072 | 0.141 |  | 0.021 | 0.109 | 0.191 |  | 0.024 | 0.066 | 0.095 |  | 0.004 | 0.036 | 0.076 | |
| Venezuela | 0.143 | 0.321 | 0.429 |  | 0.179 | 0.321 | 0.393 |  | 0.154 | 0.308 | 0.346 |  | 0.000 | 0.036 | 0.071 | |
| Vietnam | 0.000 | 0.059 | 0.086 |  | 0.007 | 0.076 | 0.109 |  | 0.023 | 0.096 | 0.135 |  | 0.040 | 0.145 | 0.198 | |

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| Panel C. Dominant Securities (Early Sample) | | | | | | | | | | | | | | | |
|  | World | | |  | World-ex-Usa | | |  | Emerging | | |  | Country Index | | | |
| **Countries** | Month | Semi. Ann | Annual |  | Month | Semi. Ann | Annual |  | Month | Semi. Ann | Annual |  | Month | Semi. Ann | Annual | |
| Argentina | 0 | 10 | 15 |  | 0 | 8 | 18 |  | 0 | 0 | 1 |  | 1 | 5 | 6 | |
| Australia | 14 | 125 | 263 |  | 21 | 149 | 292 |  | 18 | 82 | 136 |  | 42 | 150 | 238 | |
| Austria | 4 | 22 | 31 |  | 8 | 24 | 36 |  | 3 | 8 | 15 |  | 1 | 9 | 19 | |
| Belgium | 9 | 47 | 67 |  | 22 | 56 | 78 |  | 5 | 11 | 16 |  | 2 | 29 | 44 | |
| Brazil | 0 | 18 | 36 |  | 0 | 23 | 38 |  | 1 | 17 | 30 |  | 1 | 16 | 18 | |
| Canada | 25 | 161 | 293 |  | 34 | 173 | 315 |  | 20 | 86 | 123 |  | 27 | 95 | 140 | |
| Chile | 11 | 33 | 47 |  | 9 | 36 | 61 |  | 3 | 7 | 11 |  | 3 | 13 | 26 | |
| China | 0 | 18 | 106 |  | 0 | 20 | 94 |  | 1 | 43 | 73 |  | 21 | 59 | 124 | |
| Colombia | 2 | 8 | 12 |  | 3 | 8 | 12 |  | 1 | 4 | 5 |  | 2 | 5 | 6 | |
| Czech | 0 | 1 | 7 |  | 1 | 2 | 9 |  | 0 | 2 | 8 |  | 2 | 32 | 57 | |
| Denmark | 4 | 37 | 62 |  | 8 | 42 | 72 |  | 2 | 5 | 9 |  | 3 | 29 | 41 | |
| Egypt | 2 | 11 | 30 |  | 2 | 9 | 29 |  | 2 | 12 | 20 |  | 1 | 9 | 17 | |
| Finland | 0 | 15 | 29 |  | 0 | 22 | 36 |  | 3 | 18 | 24 |  | 1 | 15 | 20 | |
| France | 25 | 211 | 299 |  | 49 | 265 | 367 |  | 34 | 107 | 125 |  | 17 | 160 | 231 | |
| Germany | 30 | 135 | 214 |  | 47 | 159 | 245 |  | 22 | 55 | 82 |  | 95 | 356 | 418 | |
| Greece | 1 | 6 | 17 |  | 1 | 5 | 16 |  | 0 | 4 | 8 |  | 8 | 24 | 47 | |
| Hongkong | 1 | 25 | 76 |  | 4 | 25 | 78 |  | 1 | 17 | 30 |  | 24 | 151 | 204 | |
| Hungary | 0 | 6 | 13 |  | 1 | 9 | 14 |  | 0 | 5 | 8 |  | 0 | 5 | 8 | |
| India | 2 | 45 | 172 |  | 2 | 51 | 181 |  | 4 | 40 | 103 |  | 14 | 97 | 190 | |
| Indonesia | 0 | 25 | 48 |  | 0 | 26 | 44 |  | 1 | 14 | 25 |  | 7 | 24 | 33 | |
| Ireland | 1 | 6 | 10 |  | 1 | 11 | 18 |  | 0 | 2 | 2 |  | 1 | 12 | 17 | |
| Israel | 0 | 11 | 35 |  | 0 | 16 | 37 |  | 1 | 15 | 24 |  | 11 | 44 | 59 | |
| Italy | 12 | 34 | 48 |  | 10 | 40 | 54 |  | 8 | 10 | 12 |  | 27 | 89 | 124 | |
| Japan | 4 | 35 | 62 |  | 6 | 35 | 57 |  | 7 | 15 | 23 |  | 39 | 224 | 358 | |
| Luxembourg | 1 | 2 | 8 |  | 4 | 6 | 8 |  | 1 | 4 | 2 |  | 1 | 1 | 3 | |
| Malaysia | 5 | 16 | 33 |  | 7 | 21 | 30 |  | 3 | 9 | 13 |  | 23 | 99 | 124 | |
| Mexico | 5 | 22 | 33 |  | 5 | 23 | 34 |  | 2 | 7 | 10 |  | 4 | 13 | 16 | |
| Morocco | 10 | 25 | 31 |  | 12 | 28 | 30 |  | 10 | 19 | 21 |  | 0 | 3 | 9 | |
| Netherlands | 6 | 28 | 54 |  | 13 | 46 | 68 |  | 0 | 4 | 9 |  | 4 | 41 | 52 | |
| Newzealand | 5 | 17 | 35 |  | 5 | 24 | 40 |  | 2 | 10 | 11 |  | 7 | 24 | 34 | |
| Norway | 3 | 34 | 75 |  | 3 | 39 | 80 |  | 5 | 27 | 33 |  | 6 | 47 | 57 | |
| Pakistan | 2 | 53 | 83 |  | 2 | 54 | 85 |  | 2 | 32 | 49 |  | 2 | 34 | 42 | |
| Peru | 8 | 31 | 49 |  | 5 | 34 | 48 |  | 3 | 17 | 24 |  | 1 | 8 | 11 | |
| Philippines | 2 | 7 | 14 |  | 1 | 8 | 17 |  | 1 | 6 | 9 |  | 2 | 12 | 17 | |
| Poland | 0 | 19 | 48 |  | 0 | 19 | 45 |  | 1 | 18 | 25 |  | 10 | 38 | 60 | |
| Portugal | 3 | 6 | 17 |  | 2 | 9 | 20 |  | 1 | 6 | 5 |  | 1 | 11 | 19 | |
| Russia | 0 | 6 | 21 |  | 1 | 6 | 21 |  | 1 | 7 | 19 |  | 1 | 5 | 9 | |
| Singapore | 6 | 39 | 72 |  | 9 | 40 | 74 |  | 6 | 23 | 37 |  | 15 | 55 | 85 | |
| Southafrica | 0 | 31 | 70 |  | 2 | 42 | 82 |  | 3 | 16 | 25 |  | 4 | 41 | 61 | |
| Southkorea | 4 | 30 | 131 |  | 3 | 27 | 116 |  | 2 | 23 | 69 |  | 9 | 88 | 171 | |
| Spain | 7 | 21 | 42 |  | 8 | 30 | 41 |  | 3 | 11 | 14 |  | 8 | 39 | 53 | |
| Srilanka | 0 | 17 | 40 |  | 0 | 16 | 41 |  | 0 | 3 | 6 |  | 0 | 12 | 25 | |
| Sweden | 3 | 47 | 82 |  | 8 | 58 | 90 |  | 12 | 29 | 37 |  | 26 | 100 | 118 | |
| Switzerland | 18 | 50 | 57 |  | 22 | 53 | 75 |  | 3 | 9 | 10 |  | 10 | 37 | 44 | |
| Taiwan | 4 | 16 | 42 |  | 2 | 16 | 36 |  | 3 | 11 | 18 |  | 19 | 73 | 123 | |
| Thailand | 10 | 35 | 61 |  | 9 | 31 | 62 |  | 10 | 15 | 24 |  | 22 | 72 | 105 | |
| Turkey | 1 | 5 | 14 |  | 2 | 7 | 14 |  | 2 | 4 | 9 |  | 7 | 15 | 33 | |
| Uk | 14 | 170 | 363 |  | 18 | 249 | 448 |  | 27 | 92 | 124 |  | 179 | 654 | 828 | |
| Usa | 117 | 676 | 1241 |  | 193 | 965 | 1605 |  | 159 | 396 | 509 |  | 43 | 328 | 686 | |
| Venezuela | 2 | 5 | 8 |  | 2 | 5 | 8 |  | 2 | 3 | 6 |  | 1 | 3 | 4 | |
| Vietnam | 0 | 0 | 0 |  | 0 | 0 | 0 |  | 0 | 0 | 0 |  | 1 | 2 | 2 | |

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Panel D. Dominant Security Percentages (Early Sample) | | | | | | | | | | | | | | | |
|  | World | | |  | World-ex-Usa | | |  | Emerging | | |  | Country Index | | |
| **Countries** | Month | Semi. Ann | Annual |  | Month | Semi. Ann | Annual |  | Month | Semi. Ann | Annual |  | Month | Semi. Ann | Annual |
| Argentina | 0.000 | 0.111 | 0.167 |  | 0.000 | 0.089 | 0.200 |  | 0.000 | 0.000 | 0.013 |  | 0.011 | 0.056 | 0.067 |
| Australia | 0.007 | 0.062 | 0.131 |  | 0.010 | 0.074 | 0.145 |  | 0.010 | 0.044 | 0.073 |  | 0.021 | 0.075 | 0.118 |
| Austria | 0.022 | 0.123 | 0.173 |  | 0.045 | 0.134 | 0.201 |  | 0.021 | 0.056 | 0.104 |  | 0.006 | 0.050 | 0.106 |
| Belgium | 0.032 | 0.169 | 0.241 |  | 0.079 | 0.201 | 0.281 |  | 0.022 | 0.048 | 0.070 |  | 0.007 | 0.104 | 0.158 |
| Brazil | 0.000 | 0.175 | 0.350 |  | 0.000 | 0.223 | 0.369 |  | 0.010 | 0.168 | 0.297 |  | 0.010 | 0.155 | 0.175 |
| Canada | 0.011 | 0.070 | 0.128 |  | 0.015 | 0.075 | 0.137 |  | 0.010 | 0.044 | 0.063 |  | 0.012 | 0.041 | 0.061 |
| Chile | 0.059 | 0.176 | 0.251 |  | 0.048 | 0.193 | 0.326 |  | 0.018 | 0.042 | 0.066 |  | 0.016 | 0.070 | 0.139 |
| China | 0.000 | 0.013 | 0.074 |  | 0.000 | 0.014 | 0.065 |  | 0.001 | 0.030 | 0.051 |  | 0.015 | 0.041 | 0.086 |
| Colombia | 0.059 | 0.235 | 0.353 |  | 0.088 | 0.235 | 0.353 |  | 0.032 | 0.129 | 0.161 |  | 0.059 | 0.147 | 0.176 |
| Czech | 0.000 | 0.005 | 0.032 |  | 0.005 | 0.009 | 0.042 |  | 0.000 | 0.010 | 0.041 |  | 0.009 | 0.148 | 0.264 |
| Denmark | 0.014 | 0.132 | 0.221 |  | 0.028 | 0.149 | 0.256 |  | 0.008 | 0.020 | 0.036 |  | 0.011 | 0.103 | 0.146 |
| Egypt | 0.016 | 0.086 | 0.234 |  | 0.016 | 0.070 | 0.227 |  | 0.016 | 0.094 | 0.156 |  | 0.008 | 0.070 | 0.133 |
| Finland | 0.000 | 0.081 | 0.156 |  | 0.000 | 0.118 | 0.194 |  | 0.017 | 0.104 | 0.139 |  | 0.005 | 0.081 | 0.108 |
| France | 0.018 | 0.148 | 0.210 |  | 0.034 | 0.186 | 0.258 |  | 0.029 | 0.091 | 0.106 |  | 0.012 | 0.113 | 0.162 |
| Germany | 0.016 | 0.072 | 0.114 |  | 0.025 | 0.085 | 0.131 |  | 0.012 | 0.030 | 0.045 |  | 0.051 | 0.190 | 0.223 |
| Greece | 0.003 | 0.016 | 0.045 |  | 0.003 | 0.013 | 0.043 |  | 0.000 | 0.011 | 0.022 |  | 0.021 | 0.064 | 0.125 |
| Hongkong | 0.001 | 0.023 | 0.071 |  | 0.004 | 0.023 | 0.073 |  | 0.001 | 0.016 | 0.028 |  | 0.022 | 0.141 | 0.190 |
| Hungary | 0.000 | 0.098 | 0.213 |  | 0.016 | 0.148 | 0.230 |  | 0.000 | 0.093 | 0.148 |  | 0.000 | 0.082 | 0.131 |
| India | 0.001 | 0.022 | 0.084 |  | 0.001 | 0.025 | 0.089 |  | 0.002 | 0.022 | 0.057 |  | 0.007 | 0.048 | 0.093 |
| Indonesia | 0.000 | 0.076 | 0.145 |  | 0.000 | 0.079 | 0.133 |  | 0.003 | 0.044 | 0.078 |  | 0.021 | 0.073 | 0.100 |
| Ireland | 0.011 | 0.067 | 0.112 |  | 0.011 | 0.124 | 0.202 |  | 0.000 | 0.031 | 0.031 |  | 0.011 | 0.135 | 0.191 |
| Israel | 0.000 | 0.016 | 0.050 |  | 0.000 | 0.023 | 0.053 |  | 0.001 | 0.022 | 0.034 |  | 0.016 | 0.063 | 0.084 |
| Italy | 0.026 | 0.073 | 0.103 |  | 0.021 | 0.086 | 0.116 |  | 0.021 | 0.026 | 0.032 |  | 0.058 | 0.191 | 0.266 |
| Japan | 0.001 | 0.011 | 0.019 |  | 0.002 | 0.011 | 0.017 |  | 0.002 | 0.005 | 0.007 |  | 0.012 | 0.069 | 0.110 |
| Luxembourg | 0.024 | 0.049 | 0.195 |  | 0.098 | 0.146 | 0.195 |  | 0.027 | 0.108 | 0.054 |  | 0.024 | 0.024 | 0.073 |
| Malaysia | 0.005 | 0.017 | 0.036 |  | 0.008 | 0.023 | 0.032 |  | 0.003 | 0.010 | 0.014 |  | 0.025 | 0.107 | 0.134 |
| Mexico | 0.033 | 0.146 | 0.219 |  | 0.033 | 0.152 | 0.225 |  | 0.016 | 0.054 | 0.078 |  | 0.026 | 0.086 | 0.106 |
| Morocco | 0.152 | 0.379 | 0.470 |  | 0.182 | 0.424 | 0.455 |  | 0.152 | 0.288 | 0.318 |  | 0.000 | 0.045 | 0.136 |
| Netherlands | 0.020 | 0.095 | 0.183 |  | 0.044 | 0.156 | 0.231 |  | 0.000 | 0.017 | 0.038 |  | 0.014 | 0.139 | 0.176 |
| Newzealand | 0.026 | 0.087 | 0.179 |  | 0.026 | 0.123 | 0.205 |  | 0.013 | 0.064 | 0.071 |  | 0.036 | 0.123 | 0.174 |
| Norway | 0.009 | 0.105 | 0.231 |  | 0.009 | 0.120 | 0.246 |  | 0.018 | 0.095 | 0.116 |  | 0.018 | 0.145 | 0.175 |
| Pakistan | 0.007 | 0.181 | 0.283 |  | 0.007 | 0.184 | 0.290 |  | 0.007 | 0.115 | 0.176 |  | 0.007 | 0.116 | 0.143 |
| Peru | 0.063 | 0.244 | 0.386 |  | 0.039 | 0.268 | 0.378 |  | 0.027 | 0.150 | 0.212 |  | 0.008 | 0.063 | 0.087 |
| Philippines | 0.010 | 0.035 | 0.070 |  | 0.005 | 0.040 | 0.085 |  | 0.005 | 0.031 | 0.046 |  | 0.010 | 0.060 | 0.085 |
| Poland | 0.000 | 0.057 | 0.145 |  | 0.000 | 0.057 | 0.136 |  | 0.003 | 0.054 | 0.075 |  | 0.030 | 0.114 | 0.181 |
| Portugal | 0.018 | 0.037 | 0.104 |  | 0.012 | 0.055 | 0.122 |  | 0.009 | 0.052 | 0.043 |  | 0.006 | 0.067 | 0.116 |
| Russia | 0.000 | 0.072 | 0.253 |  | 0.012 | 0.072 | 0.253 |  | 0.012 | 0.084 | 0.229 |  | 0.012 | 0.060 | 0.108 |
| Singapore | 0.009 | 0.056 | 0.103 |  | 0.013 | 0.057 | 0.106 |  | 0.009 | 0.033 | 0.053 |  | 0.021 | 0.079 | 0.122 |
| Southafrica | 0.000 | 0.047 | 0.106 |  | 0.003 | 0.063 | 0.124 |  | 0.005 | 0.026 | 0.041 |  | 0.006 | 0.062 | 0.092 |
| Southkorea | 0.002 | 0.015 | 0.066 |  | 0.002 | 0.014 | 0.058 |  | 0.001 | 0.012 | 0.035 |  | 0.005 | 0.044 | 0.086 |
| Spain | 0.029 | 0.088 | 0.176 |  | 0.033 | 0.126 | 0.172 |  | 0.014 | 0.050 | 0.063 |  | 0.033 | 0.163 | 0.222 |
| Srilanka | 0.000 | 0.081 | 0.191 |  | 0.000 | 0.077 | 0.196 |  | 0.000 | 0.015 | 0.030 |  | 0.000 | 0.057 | 0.120 |
| Sweden | 0.005 | 0.075 | 0.130 |  | 0.013 | 0.092 | 0.143 |  | 0.023 | 0.056 | 0.071 |  | 0.041 | 0.159 | 0.187 |
| Switzerland | 0.051 | 0.141 | 0.161 |  | 0.062 | 0.149 | 0.211 |  | 0.010 | 0.030 | 0.033 |  | 0.028 | 0.104 | 0.124 |
| Taiwan | 0.003 | 0.011 | 0.030 |  | 0.001 | 0.011 | 0.025 |  | 0.002 | 0.008 | 0.013 |  | 0.013 | 0.051 | 0.087 |
| Thailand | 0.016 | 0.054 | 0.095 |  | 0.014 | 0.048 | 0.096 |  | 0.016 | 0.025 | 0.039 |  | 0.034 | 0.112 | 0.163 |
| Turkey | 0.003 | 0.014 | 0.039 |  | 0.006 | 0.019 | 0.039 |  | 0.006 | 0.011 | 0.026 |  | 0.019 | 0.041 | 0.091 |
| Uk | 0.005 | 0.059 | 0.127 |  | 0.006 | 0.087 | 0.156 |  | 0.012 | 0.040 | 0.054 |  | 0.062 | 0.228 | 0.289 |
| Usa | 0.013 | 0.073 | 0.135 |  | 0.021 | 0.105 | 0.174 |  | 0.019 | 0.047 | 0.060 |  | 0.005 | 0.036 | 0.074 |
| Venezuela | 0.077 | 0.192 | 0.308 |  | 0.077 | 0.192 | 0.308 |  | 0.083 | 0.125 | 0.250 |  | 0.038 | 0.115 | 0.154 |
| Vietnam | 0.000 | 0.000 | 0.000 |  | 0.000 | 0.000 | 0.000 |  | 0.000 | 0.000 | 0.000 |  | 0.333 | 0.667 | 0.667 |

**Table 6**

Characteristics of Dominant Securities

Cumulative distributions of annual returns of all securities in Eurozone countries are examined in comparison to World index, Emerging index and Country index. values are estimated for each security as explained in earlier tables. Dominant and inferior securities are determined using Almost Dominance rules. This table reports Market value (MV), Price-to-Book (PB), Dividend yield (DP), Price-to-Earnings (PE), Return on Equity (ROE), and Return on Invested Capital (ROIC). Panel A reports results for the full sample. Panel V reports results for the sample up to 2008. The first block in each panel determines the dominant and inferior samples using a comparison against the World index. The second block in each panel determines the dominant and inferior samples using a comparison against the Emerging index. Finally, the third block in each panel determines the dominant and inferior samples using a comparison against the Country index.

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Panel A. Average Characteristics (Full Sample) | | | | |
|  | Dominant Sample | | Inferior Sample | Difference |
|  | | Comparing with the World Index | | |
| MV | 1346.893 | | 755.778 | 591.115 |
| PB | 3.176 | | 2.495 | 0.681 |
| DP | 4.624 | | 5.130 | -0.506 |
| PE | 32.879 | | 34.340 | -1.461 |
| ROE | 11.652 | | -2.698 | 14.350 |
| ROIC | 9.763 | | 1.984 | 7.779 |
|  | | Comparing with the Emerging Index | | |
| MV | 1628.969 | | 788.696 | 840.273 |
| PB | 4.002 | | 2.476 | 1.526 |
| DP | 3.767 | | 5.089 | -1.322 |
| PE | 27.118 | | 34.017 | -6.899 |
| ROE | 14.116 | | -1.999 | 16.115 |
| ROIC | 11.311 | | 2.336 | 8.974 |
|  | | Comparing with the Country Index | | |
| MV | 1361.733 | | 657.090 | 704.643 |
| PB | 2.891 | | 2.502 | 0.390 |
| DP | 4.468 | | 5.196 | -0.727 |
| PE | 25.813 | | 35.581 | -9.768 |
| ROE | 12.727 | | -4.449 | 17.176 |
| ROIC | 9.981 | | 1.043 | 8.938 |

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Panel B. Average Characteristics (Early Sample) | | | | |
|  | Dominant Sample | | Inferior Sample | Difference |
|  | | Comparing with the World Index | | |
| MV | 1458.863 | | 731.987 | 726.877 |
| PB | 2.992 | | 2.508 | 0.484 |
| DP | 4.495 | | 5.190 | -0.694 |
| PE | 39.903 | | 33.346 | 6.557 |
| ROE | 7.758 | | -2.474 | 10.232 |
| ROIC | 9.456 | | 1.893 | 7.563 |
|  | | Comparing with the Emerging Index | | |
| MV | 1251.351 | | 800.926 | 450.425 |
| PB | 3.849 | | 2.492 | 1.358 |
| DP | 3.617 | | 5.081 | -1.464 |
| PE | 27.387 | | 29.552 | -2.165 |
| ROE | 10.068 | | -1.353 | 11.421 |
| ROIC | 9.847 | | 2.486 | 7.361 |
|  | | Comparing with the Country Index | | |
| MV | 1352.383 | | 694.627 | 657.756 |
| PB | 2.765 | | 2.524 | 0.241 |
| DP | 4.427 | | 5.161 | -0.735 |
| PE | 31.411 | | 34.171 | -2.760 |
| ROE | 9.057 | | -3.116 | 12.174 |
| ROIC | 8.984 | | 1.546 | 7.438 |

**Table 7**

Characteristics of Dominant Securities at the Country Level (Full Sample)

Cumulative distributions of annual returns of all securities in Eurozone countries are examined in comparison to World index, Emerging index and Country index. values are estimated for each security as explained in earlier tables. Dominant and inferior securities are determined using Almost Dominance rules. This table reports average Market value (MV), Price-to-Book (PB), Dividend yield (DP), Price-to-Earnings (PE), Return on Equity (ROE), and Return on Invested Capital (ROIC) for each country using the full sample.

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| Panel A. Comparing with the World index (Full Sample) | | | | | | | |
| Dominant Sample | | | | | | | |
|  | MV | PB | DP | PE | ROE | ROIC | ASSETS |
| Austria | 930.483 | 5.447 | 3.718 | 29.321 | -1.242 | 4.969 | 10600000 |
| Belgium | 784.771 | 1.928 | 6.476 | 28.729 | 5.948 | 5.939 | 6475148 |
| Denmark | 602.726 | 2.130 | 2.959 | 26.236 | 10.346 | 9.253 | 1030310 |
| Finland | 1204.548 | 3.070 | 3.704 | 21.408 | 18.388 | 13.737 | 1282861 |
| France | 707.958 | 2.768 | 6.210 | 27.003 | 12.157 | 9.851 | 2019025 |
| Germany | 1628.293 | 2.928 | 3.183 | 29.711 | 7.658 | 7.884 | 3808315 |
| Greece | 510.454 | 4.545 | 3.962 | 147.642 | 7.156 | 5.795 | 410248 |
| Ireland | 1345.990 | 3.170 | 4.487 | 18.012 | 15.923 | 12.746 | 1667089 |
| Italy | 2995.605 | 3.185 | 3.516 | 22.121 | 13.627 | 9.024 | 7811792 |
| Netherlands | 3440.899 | 2.372 | 11.010 | 17.169 | 14.627 | 10.003 | 31200000 |
| Portugal | 101.452 | 1.662 | 5.773 | 21.189 | 9.950 | 9.891 | 149452 |
| Spain | 3012.352 | 4.126 | 3.299 | 24.851 | 14.166 | 10.337 | 2603368 |
| Sweden | 654.507 | 3.169 | 3.352 | 24.700 | 16.358 | 12.945 | 1413931 |
| Uk | 936.460 | 3.958 | 3.088 | 22.213 | 18.071 | 14.314 | 1495002 |
| Inferior Sample | | | | | | | |
|  | MV | PB | DP | PE | ROE | ROIC | ASSETS |
| Austria | 599.031 | 3.043 | 3.706 | 27.855 | -19.276 | -0.685 | 3341926 |
| Belgium | 729.032 | 2.110 | 8.347 | 27.296 | 3.969 | 3.519 | 5713576 |
| Denmark | 373.413 | 1.999 | 4.609 | 28.655 | -2.245 | 2.204 | 1366518 |
| Finland | 617.214 | 2.148 | 4.465 | 25.093 | 4.743 | 6.390 | 1648672 |
| France | 813.394 | 2.462 | 5.732 | 28.252 | 1.212 | 2.565 | 3192276 |
| Germany | 837.883 | 2.551 | 3.861 | 41.069 | -5.874 | -1.136 | 3814808 |
| Greece | 241.683 | 2.351 | 3.280 | 65.103 | -1.913 | 4.802 | 1145095 |
| Ireland | 492.216 | 2.390 | 4.098 | 66.690 | -5.433 | 2.724 | 4604619 |
| Italy | 1244.394 | 2.046 | 3.720 | 30.204 | -3.479 | 2.339 | 6400840 |
| Netherlands | 1026.373 | 3.189 | 13.464 | 20.543 | 6.269 | 8.360 | 5886461 |
| Portugal | 589.407 | 1.947 | 4.169 | 40.597 | 4.134 | 4.044 | 3111997 |
| Spain | 2216.540 | 2.515 | 3.574 | 22.658 | 5.482 | 7.289 | 10700000 |
| Sweden | 313.972 | 2.799 | 4.580 | 32.324 | -16.755 | -9.162 | 1215209 |
| Uk | 486.341 | 3.380 | 4.221 | 24.426 | -8.602 | -5.472 | 1223374 |
| Differences | | | | | | | |
|  | MV | PB | DP | PE | ROE | ROIC | ASSETS |
| Austria | 331.452 | 2.404 | 0.012 | 1.466 | 18.034 | 5.654 | 7258074 |
| Belgium | 55.739 | -0.182 | -1.870 | 1.433 | 1.979 | 2.420 | 761572 |
| Denmark | 229.314 | 0.130 | -1.651 | -2.418 | 12.592 | 7.049 | -336208 |
| Finland | 587.334 | 0.922 | -0.761 | -3.684 | 13.644 | 7.347 | -365811 |
| France | -105.436 | 0.307 | 0.478 | -1.249 | 10.945 | 7.286 | -1173251 |
| Germany | 790.410 | 0.378 | -0.678 | -11.358 | 13.532 | 9.020 | -6493 |
| Greece | 268.772 | 2.194 | 0.682 | 82.538 | 9.070 | 0.994 | -734847 |
| Ireland | 853.774 | 0.781 | 0.388 | -48.678 | 21.356 | 10.021 | -2937530 |
| Italy | 1751.211 | 1.139 | -0.204 | -8.083 | 17.105 | 6.686 | 1410952 |
| Netherlands | 2414.526 | -0.817 | -2.454 | -3.374 | 8.358 | 1.643 | 25313539 |
| Portugal | -487.956 | -0.285 | 1.604 | -19.407 | 5.816 | 5.847 | -2962545 |
| Spain | 795.812 | 1.612 | -0.275 | 2.193 | 8.683 | 3.048 | -8096632 |
| Sweden | 340.536 | 0.370 | -1.228 | -7.625 | 33.113 | 22.107 | 198722 |
| Uk | 450.119 | 0.578 | -1.133 | -2.213 | 26.673 | 19.786 | 271628 |
| Average | 591.115 | 0.681 | -0.506 | -1.461 | 14.350 | 7.779 | 1328655 |

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| Panel B. Comparing with the Emerging index (Full Sample) | | | | | | | |
| Dominant Sample | | | | | | | |
|  | MV | PB | DP | PE | ROE | ROIC | ASSETS |
| Austria | 1768.654 | 5.893 | 3.245 | 15.329 | 5.353 | 6.132 | 12500000 |
| Belgium | 1150.395 | 2.604 | 9.022 | 37.504 | 2.719 | 3.511 | 3137060 |
| Denmark | 1633.251 | 3.633 | 2.473 | 21.948 | 13.550 | 10.407 | 648018 |
| Finland | 946.451 | 2.862 | 3.232 | 25.346 | 4.584 | 11.909 | 1246781 |
| France | 539.877 | 3.062 | 5.651 | 28.508 | 12.078 | 10.050 | 731444 |
| Germany | 1486.820 | 2.531 | 3.383 | 25.403 | 8.144 | 8.418 | 5539766 |
| Greece | 318.884 | 3.829 | 3.333 | 63.808 | 17.518 | 11.020 | 328637 |
| Ireland | 3769.653 | 4.982 | 1.910 | 22.152 | 30.254 | 26.279 | 3251961 |
| Italy | 3321.122 | 3.817 | 2.976 | 19.996 | 16.972 | 11.401 | 6863530 |
| Netherlands | 2373.617 | 6.926 | 5.389 | 25.320 | 21.933 | 13.714 | 2269632 |
| Portugal | 1240.266 | 3.510 | 3.375 | 22.202 | 12.715 | 6.680 | 5186808 |
| Spain | 2820.469 | 4.233 | 2.556 | 24.691 | 19.197 | 11.352 | 2476103 |
| Sweden | 622.775 | 3.425 | 3.401 | 23.075 | 15.723 | 13.697 | 1409880 |
| Uk | 813.335 | 4.727 | 2.795 | 24.371 | 16.880 | 13.781 | 1232022 |
| Inferior Sample | | | | | | | |
|  | MV | PB | DP | PE | ROE | ROIC | ASSETS |
| Austria | 580.960 | 3.080 | 3.732 | 28.558 | -19.072 | -0.567 | 3466215 |
| Belgium | 714.530 | 2.034 | 7.823 | 26.993 | 4.495 | 4.051 | 6085559 |
| Denmark | 343.864 | 1.939 | 4.472 | 28.670 | -1.450 | 2.680 | 1359052 |
| Finland | 650.500 | 2.190 | 4.489 | 24.692 | 6.302 | 6.695 | 1645575 |
| France | 819.702 | 2.453 | 5.839 | 27.988 | 2.021 | 3.070 | 3247454 |
| Germany | 876.330 | 2.580 | 3.808 | 41.003 | -5.386 | -0.823 | 3725287 |
| Greece | 251.068 | 2.404 | 3.307 | 68.273 | -1.881 | 4.748 | 1131903 |
| Ireland | 522.718 | 2.424 | 4.188 | 61.376 | -3.462 | 3.476 | 4252149 |
| Italy | 1288.363 | 2.049 | 3.734 | 30.072 | -3.227 | 2.401 | 6463542 |
| Netherlands | 1349.602 | 2.931 | 13.301 | 19.844 | 6.976 | 8.417 | 9857935 |
| Portugal | 526.027 | 1.845 | 4.311 | 39.769 | 4.036 | 4.270 | 2813018 |
| Spain | 2266.365 | 2.590 | 3.589 | 22.747 | 5.687 | 7.394 | 10300000 |
| Sweden | 329.540 | 2.777 | 4.508 | 32.117 | -16.141 | -8.881 | 1218889 |
| Uk | 522.176 | 3.368 | 4.148 | 24.131 | -6.888 | -4.222 | 1257039 |
| Differences | | | | | | | |
|  | MV | PB | DP | PE | ROE | ROIC | ASSETS |
| Austria | 1187.694 | 2.812 | -0.488 | -13.230 | 24.425 | 6.699 | 9033785 |
| Belgium | 435.865 | 0.571 | 1.199 | 10.511 | -1.776 | -0.539 | -2948499 |
| Denmark | 1289.387 | 1.693 | -1.999 | -6.722 | 15.000 | 7.727 | -711035 |
| Finland | 295.952 | 0.672 | -1.257 | 0.654 | -1.718 | 5.213 | -398794 |
| France | -279.825 | 0.609 | -0.189 | 0.520 | 10.057 | 6.980 | -2516010 |
| Germany | 610.490 | -0.050 | -0.426 | -15.600 | 13.530 | 9.240 | 1814479 |
| Greece | 67.816 | 1.425 | 0.026 | -4.465 | 19.399 | 6.272 | -803266 |
| Ireland | 3246.935 | 2.558 | -2.277 | -39.224 | 33.716 | 22.803 | -1000188 |
| Italy | 2032.759 | 1.768 | -0.757 | -10.076 | 20.199 | 9.001 | 399988 |
| Netherlands | 1024.015 | 3.995 | -7.912 | 5.476 | 14.957 | 5.296 | -7588303 |
| Portugal | 714.239 | 1.665 | -0.936 | -17.567 | 8.678 | 2.410 | 2373790 |
| Spain | 554.104 | 1.642 | -1.033 | 1.944 | 13.510 | 3.958 | -7823897 |
| Sweden | 293.235 | 0.648 | -1.106 | -9.042 | 31.864 | 22.577 | 190991 |
| Uk | 291.159 | 1.358 | -1.353 | 0.240 | 23.768 | 18.003 | -25017 |
| Average | 840.273 | 1.526 | -1.322 | -6.899 | 16.115 | 8.974 | -714427 |

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| Panel C. Comparing with the Country index (Full Sample) | | | | | | | |
| Dominant Sample | | | | | | | |
|  | MV | PB | DP | PE | ROE | ROIC | ASSETS |
| Austria | 986.197 | 5.309 | 3.555 | 17.267 | 5.585 | 5.437 | 12500000 |
| Belgium | 1028.977 | 2.307 | 7.780 | 31.559 | 5.900 | 5.085 | 10400000 |
| Denmark | 781.115 | 2.049 | 2.800 | 24.231 | 8.631 | 8.759 | 920631 |
| Finland | 795.028 | 2.934 | 3.887 | 19.957 | 18.110 | 14.297 | 655238 |
| France | 712.344 | 2.967 | 5.811 | 26.753 | 13.790 | 10.706 | 1215146 |
| Germany | 2018.462 | 2.693 | 3.250 | 27.747 | 9.355 | 8.688 | 7144928 |
| Greece | 609.264 | 3.766 | 3.630 | 75.480 | 10.654 | 8.476 | 511676 |
| Ireland | 286.987 | 2.243 | 4.135 | 15.897 | 18.743 | 13.234 | 488487 |
| Italy | 2660.952 | 2.131 | 3.345 | 23.168 | 10.572 | 7.417 | 10700000 |
| Netherlands | 2439.743 | 2.563 | 9.247 | 18.133 | 16.366 | 11.242 | 24000000 |
| Portugal | 274.775 | 1.848 | 4.632 | 19.423 | 12.013 | 9.367 | 875364 |
| Spain | 4579.793 | 3.150 | 3.686 | 19.204 | 15.934 | 11.475 | 18000000 |
| Sweden | 907.872 | 3.017 | 3.343 | 21.051 | 16.389 | 12.823 | 3694496 |
| Uk | 982.755 | 3.501 | 3.456 | 21.515 | 16.133 | 12.733 | 2171234 |
| Inferior Sample | | | | | | | |
|  | MV | PB | DP | PE | ROE | ROIC | ASSETS |
| Austria | 609.787 | 3.101 | 3.720 | 28.617 | -19.251 | -0.565 | 3406358 |
| Belgium | 687.711 | 2.040 | 7.916 | 26.983 | 4.160 | 3.864 | 5212387 |
| Denmark | 326.115 | 2.007 | 4.685 | 29.195 | -2.721 | 1.842 | 1411223 |
| Finland | 659.597 | 2.155 | 4.454 | 25.338 | 4.612 | 6.228 | 1734019 |
| France | 808.925 | 2.441 | 5.827 | 28.249 | 1.309 | 2.665 | 3280514 |
| Germany | 582.567 | 2.541 | 4.029 | 44.209 | -9.040 | -3.143 | 2797634 |
| Greece | 214.857 | 2.289 | 3.273 | 67.448 | -2.802 | 4.481 | 1181604 |
| Ireland | 648.091 | 2.537 | 4.160 | 69.879 | -7.258 | 2.056 | 5019114 |
| Italy | 787.944 | 2.097 | 3.889 | 32.766 | -8.317 | 0.629 | 4627767 |
| Netherlands | 1180.579 | 3.167 | 13.897 | 20.386 | 5.779 | 8.089 | 6798986 |
| Portugal | 590.276 | 1.938 | 4.235 | 41.524 | 3.778 | 3.929 | 3127217 |
| Spain | 1530.255 | 2.490 | 3.495 | 23.987 | 2.881 | 6.194 | 7203265 |
| Sweden | 212.157 | 2.793 | 4.778 | 34.231 | -21.067 | -12.014 | 568484 |
| Uk | 360.402 | 3.427 | 4.384 | 25.321 | -14.354 | -9.650 | 882299 |
| Differences | | | | | | | |
|  | MV | PB | DP | PE | ROE | ROIC | ASSETS |
| Austria | 376.410 | 2.208 | -0.165 | -11.350 | 24.836 | 6.003 | 9093642 |
| Belgium | 341.266 | 0.267 | -0.135 | 4.576 | 1.740 | 1.221 | 5187613 |
| Denmark | 455.000 | 0.041 | -1.886 | -4.963 | 11.353 | 6.917 | -490592 |
| Finland | 135.431 | 0.779 | -0.567 | -5.382 | 13.498 | 8.069 | -1078781 |
| France | -96.581 | 0.526 | -0.015 | -1.496 | 12.482 | 8.041 | -2065368 |
| Germany | 1435.895 | 0.152 | -0.779 | -16.462 | 18.395 | 11.830 | 4347294 |
| Greece | 394.407 | 1.477 | 0.358 | 8.032 | 13.456 | 3.995 | -669929 |
| Ireland | -361.104 | -0.293 | -0.024 | -53.982 | 26.001 | 11.177 | -4530628 |
| Italy | 1873.008 | 0.034 | -0.544 | -9.598 | 18.888 | 6.788 | 6072233 |
| Netherlands | 1259.164 | -0.604 | -4.650 | -2.253 | 10.587 | 3.153 | 17201014 |
| Portugal | -315.502 | -0.090 | 0.397 | -22.101 | 8.236 | 5.439 | -2251853 |
| Spain | 3049.538 | 0.660 | 0.191 | -4.783 | 13.052 | 5.281 | 10796735 |
| Sweden | 695.715 | 0.224 | -1.435 | -13.180 | 37.456 | 24.837 | 3126012 |
| Uk | 622.353 | 0.073 | -0.927 | -3.806 | 30.487 | 22.382 | 1288935 |
| Average | 704.643 | 0.390 | -0.727 | -9.768 | 17.176 | 8.938 | 3287595 |

**Table 8**

Characteristics of Dominant Securities at the Country Level (Earlier Sample)

Cumulative distributions of annual returns of all securities in Eurozone countries are examined in comparison to World index, Emerging index and Country index. values are estimated for each security as explained in earlier tables. Dominant and inferior securities are determined using Almost Dominance rules. This table reports average Market value (MV), Price-to-Book (PB), Dividend yield (DP), Price-to-Earnings (PE), Return on Equity (ROE), and Return on Invested Capital (ROIC) for each country using sample up to 2008.

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| Panel A. Comparing with the World index (Early Sample) | | | | | | | |
| Dominant Sample | | | | | | | |
|  | MV | PB | DP | PE | ROE | ROIC | ASSETS |
| Austria | 1493.743 | 4.261 | 3.261 | 33.439 | 0.117 | 4.298 | 13500000 |
| Belgium | 914.085 | 1.739 | 5.025 | 25.341 | 10.253 | 7.563 | 7048858 |
| Denmark | 464.384 | 1.678 | 2.920 | 26.453 | 8.635 | 8.198 | 918374 |
| Finland | 931.865 | 2.952 | 4.228 | 21.408 | 15.959 | 12.255 | 977470 |
| France | 998.551 | 2.706 | 6.174 | 25.881 | 13.070 | 10.216 | 2959638 |
| Germany | 1868.849 | 3.005 | 3.195 | 28.948 | 8.022 | 7.702 | 5071597 |
| Greece | 844.571 | 4.804 | 3.602 | 126.592 | 13.529 | 8.139 | 533563 |
| Ireland | 879.746 | 3.723 | 4.608 | 136.518 | -45.629 | 10.538 | 1207821 |
| Italy | 4223.539 | 2.722 | 3.555 | 26.927 | 12.290 | 7.885 | 12500000 |
| Netherlands | 2339.759 | 2.182 | 10.317 | 16.332 | 14.533 | 10.310 | 30000000 |
| Portugal | 515.229 | 1.842 | 4.929 | 19.675 | 13.017 | 9.630 | 1263098 |
| Spain | 3189.619 | 3.412 | 3.269 | 24.504 | 13.875 | 10.489 | 8374163 |
| Sweden | 670.658 | 3.125 | 4.525 | 24.731 | 13.526 | 11.302 | 1476091 |
| Uk | 1089.487 | 3.733 | 3.328 | 21.888 | 17.416 | 13.862 | 2210657 |
| Inferior Sample | | | | | | | |
|  | MV | PB | DP | PE | ROE | ROIC | ASSETS |
| Austria | 475.300 | 3.084 | 3.798 | 27.049 | -20.538 | -0.906 | 2459774 |
| Belgium | 693.813 | 2.154 | 8.791 | 28.246 | 2.945 | 3.152 | 5579564 |
| Denmark | 385.514 | 2.098 | 4.835 | 28.840 | -3.109 | 1.745 | 1426319 |
| Finland | 629.619 | 2.116 | 4.415 | 25.344 | 4.317 | 6.193 | 1729410 |
| France | 745.463 | 2.469 | 5.730 | 28.543 | 0.781 | 2.332 | 3010231 |
| Germany | 804.231 | 2.533 | 3.871 | 41.320 | -6.112 | -1.240 | 3679730 |
| Greece | 226.215 | 2.335 | 3.295 | 65.755 | -2.177 | 4.711 | 1142621 |
| Ireland | 557.113 | 2.330 | 4.087 | 50.456 | 3.059 | 3.147 | 4626397 |
| Italy | 1074.966 | 2.053 | 3.722 | 29.982 | -3.863 | 2.243 | 5949729 |
| Netherlands | 1185.952 | 3.261 | 13.748 | 20.850 | 5.976 | 8.232 | 5189705 |
| Portugal | 556.986 | 1.937 | 4.212 | 41.179 | 3.770 | 3.957 | 3074056 |
| Spain | 2126.840 | 2.518 | 3.604 | 22.537 | 4.822 | 7.008 | 10300000 |
| Sweden | 314.028 | 2.806 | 4.374 | 32.293 | -16.227 | -8.839 | 1208787 |
| Uk | 471.771 | 3.413 | 4.172 | 24.448 | -8.277 | -5.236 | 1138347 |
| Differences | | | | | | | |
|  | MV | PB | DP | PE | ROE | ROIC | ASSETS |
| Austria | 1018.443 | 1.177 | -0.537 | 6.390 | 20.656 | 5.204 | 11040226 |
| Belgium | 220.272 | -0.415 | -3.766 | -2.905 | 7.308 | 4.411 | 1469294 |
| Denmark | 78.870 | -0.420 | -1.914 | -2.387 | 11.744 | 6.453 | -507945 |
| Finland | 302.246 | 0.836 | -0.187 | -3.937 | 11.642 | 6.062 | -751941 |
| France | 253.089 | 0.237 | 0.444 | -2.662 | 12.289 | 7.884 | -50593 |
| Germany | 1064.618 | 0.472 | -0.676 | -12.372 | 14.134 | 8.941 | 1391867 |
| Greece | 618.355 | 2.469 | 0.307 | 60.837 | 15.705 | 3.428 | -609058 |
| Ireland | 322.634 | 1.393 | 0.521 | 86.062 | -48.688 | 7.391 | -3418576 |
| Italy | 3148.573 | 0.668 | -0.167 | -3.055 | 16.154 | 5.642 | 6550271 |
| Netherlands | 1153.807 | -1.078 | -3.431 | -4.518 | 8.557 | 2.079 | 24810295 |
| Portugal | -41.758 | -0.095 | 0.717 | -21.504 | 9.247 | 5.673 | -1810958 |
| Spain | 1062.779 | 0.894 | -0.336 | 1.968 | 9.054 | 3.481 | -1925837 |
| Sweden | 356.630 | 0.318 | 0.152 | -7.562 | 29.753 | 20.140 | 267304 |
| Uk | 617.716 | 0.320 | -0.844 | -2.560 | 25.693 | 19.099 | 1072310 |
| Average | 726.877 | 0.484 | -0.694 | 6.557 | 10.232 | 7.563 | 2680476 |

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| Panel B. Comparing with the Emerging index (Early Sample) | | | | | | | |
| Dominant Sample | | | | | | | |
|  | MV | PB | DP | PE | ROE | ROIC | ASSETS |
| Austria | 2120.339 | 5.371 | 2.681 | 32.862 | 3.451 | 4.857 | 10600000 |
| Belgium | 161.799 | 2.206 | 6.324 | 25.711 | 10.606 | 5.485 | 582731 |
| Denmark | 449.886 | 2.900 | 2.577 | 33.488 | 15.154 | 10.460 | 359093 |
| Finland | 1061.699 | 2.336 | 4.226 | 20.932 | 5.919 | 9.998 | 1630525 |
| France | 492.922 | 3.041 | 6.010 | 27.385 | 15.057 | 11.542 | 639657 |
| Germany | 1473.174 | 2.325 | 2.834 | 27.883 | 7.499 | 6.382 | 3813329 |
| Greece | 370.884 | 3.822 | 2.160 | 64.764 | 19.068 | 13.530 | 367731 |
| Ireland | 863.089 | 6.374 | 1.910 | 0.000 | -28.228 | 11.912 | 197441 |
| Italy | 3869.572 | 4.250 | 3.086 | 33.738 | 15.924 | 9.194 | 3482244 |
| Netherlands | 1427.486 | 7.059 | 5.510 | 23.751 | 19.910 | 13.658 | 1324083 |
| Portugal | 1394.311 | 3.686 | 2.074 | 21.599 | 14.514 | 6.969 | 6132144 |
| Spain | 2109.246 | 2.639 | 2.749 | 21.329 | 15.542 | 10.731 | 2716439 |
| Sweden | 751.200 | 3.553 | 5.634 | 24.422 | 10.703 | 9.991 | 1993398 |
| Uk | 973.308 | 4.327 | 2.866 | 25.561 | 15.879 | 13.152 | 2310612 |
| Inferior Sample | | | | | | | |
|  | MV | PB | DP | PE | ROE | ROIC | ASSETS |
| Austria | 518.534 | 3.033 | 3.799 | 27.568 | -19.726 | -0.674 | 3341321 |
| Belgium | 772.273 | 2.066 | 7.978 | 27.701 | 4.046 | 3.937 | 6175788 |
| Denmark | 399.555 | 1.990 | 4.444 | 28.202 | -1.232 | 2.814 | 1354687 |
| Finland | 620.123 | 2.232 | 4.408 | 25.295 | 6.187 | 6.721 | 1607954 |
| France | 820.878 | 2.462 | 5.809 | 28.086 | 1.844 | 3.008 | 3227401 |
| Germany | 884.498 | 2.585 | 3.828 | 40.688 | -5.220 | -0.638 | 3814294 |
| Greece | 249.763 | 2.400 | 3.333 | 68.267 | -1.961 | 4.688 | 1133492 |
| Ireland | 585.224 | 2.388 | 4.188 | 0.000 | 4.069 | 3.818 | 4324875 |
| Italy | 1299.373 | 2.062 | 3.722 | 29.619 | -2.948 | 2.562 | 6540101 |
| Netherlands | 1382.724 | 2.942 | 13.265 | 19.911 | 7.100 | 8.440 | 9857840 |
| Portugal | 525.665 | 1.852 | 4.343 | 39.671 | 4.034 | 4.278 | 2792010 |
| Spain | 2299.948 | 2.663 | 3.597 | 22.887 | 5.719 | 7.377 | 10400000 |
| Sweden | 332.331 | 2.794 | 4.308 | 31.748 | -14.533 | -7.727 | 1188981 |
| Uk | 522.072 | 3.414 | 4.110 | 24.087 | -6.316 | -3.797 | 1212806 |
| Differences | | | | | | | |
|  | MV | PB | DP | PE | ROE | ROIC | ASSETS |
| Austria | 1601.805 | 2.338 | -1.118 | 5.295 | 23.177 | 5.531 | 7258679 |
| Belgium | -610.474 | 0.140 | -1.654 | -1.990 | 6.560 | 1.549 | -5593057 |
| Denmark | 50.331 | 0.910 | -1.867 | 5.286 | 16.386 | 7.646 | -995594 |
| Finland | 441.576 | 0.104 | -0.183 | -4.362 | -0.269 | 3.277 | 22571 |
| France | -327.956 | 0.578 | 0.201 | -0.701 | 13.213 | 8.534 | -2587744 |
| Germany | 588.676 | -0.261 | -0.994 | -12.805 | 12.720 | 7.020 | -965 |
| Greece | 121.120 | 1.422 | -1.174 | -3.503 | 21.029 | 8.842 | -765761 |
| Ireland | 277.865 | 3.987 | -2.277 | 0.000 | -32.349 | 8.094 | -4127434 |
| Italy | 2570.199 | 2.188 | -0.636 | 4.119 | 18.872 | 6.632 | -3057857 |
| Netherlands | 44.762 | 4.117 | -7.754 | 3.840 | 12.810 | 5.217 | -8533757 |
| Portugal | 868.646 | 1.835 | -2.270 | -18.072 | 10.480 | 2.691 | 3340134 |
| Spain | -190.702 | -0.024 | -0.848 | -1.558 | 9.823 | 3.354 | -7683561 |
| Sweden | 418.869 | 0.759 | 1.326 | -7.326 | 25.236 | 17.718 | 804417 |
| Uk | 451.236 | 0.913 | -1.244 | 1.473 | 22.195 | 16.949 | 1097806 |
| Average | 450.425 | 1.358 | -1.464 | -2.165 | -6.723 | 7.361 | -1487295 |

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| Panel C. Comparing with the Country index (Early Sample) | | | | | | | |
| Dominant Sample | | | | | | | |
|  | MV | PB | DP | PE | ROE | ROIC | ASSETS |
| Austria | 1112.788 | 5.241 | 2.717 | 30.541 | 4.716 | 5.414 | 12800000 |
| Belgium | 691.257 | 1.972 | 6.874 | 28.015 | 9.579 | 5.868 | 10300000 |
| Denmark | 248.080 | 1.335 | 3.039 | 25.387 | 7.596 | 7.328 | 507986 |
| Finland | 1229.854 | 2.847 | 3.930 | 22.369 | 15.108 | 11.396 | 2328729 |
| France | 928.699 | 2.958 | 5.998 | 25.632 | 12.591 | 10.172 | 3228606 |
| Germany | 2071.208 | 2.837 | 3.207 | 29.545 | 8.277 | 8.041 | 7935025 |
| Greece | 535.839 | 3.413 | 3.463 | 65.132 | 8.118 | 7.796 | 1406904 |
| Ireland | 321.376 | 2.092 | 4.739 | 85.318 | -19.281 | 9.415 | 2124760 |
| Italy | 3062.383 | 2.056 | 3.457 | 25.419 | 8.993 | 6.359 | 12600000 |
| Netherlands | 2007.632 | 2.369 | 9.087 | 17.440 | 15.255 | 10.823 | 22400000 |
| Portugal | 687.443 | 2.040 | 3.792 | 22.916 | 11.771 | 8.937 | 1903729 |
| Spain | 4336.746 | 3.015 | 3.792 | 19.146 | 14.385 | 10.386 | 17900000 |
| Sweden | 808.806 | 3.124 | 4.313 | 21.003 | 14.656 | 11.773 | 2716855 |
| Uk | 891.250 | 3.414 | 3.564 | 21.893 | 15.038 | 12.070 | 1982136 |
| Inferior Sample | | | | | | | |
|  | MV | PB | DP | PE | ROE | ROIC | ASSETS |
| Austria | 587.526 | 3.061 | 3.818 | 27.750 | -19.681 | -0.686 | 3194568 |
| Belgium | 750.368 | 2.085 | 8.077 | 27.568 | 3.766 | 3.798 | 5326586 |
| Denmark | 423.786 | 2.119 | 4.597 | 28.824 | -2.071 | 2.361 | 1453335 |
| Finland | 610.893 | 2.175 | 4.442 | 25.023 | 5.121 | 6.660 | 1528238 |
| France | 770.921 | 2.443 | 5.792 | 28.443 | 1.496 | 2.749 | 2965531 |
| Germany | 639.121 | 2.514 | 3.982 | 42.866 | -7.918 | -2.421 | 2814844 |
| Greece | 212.183 | 2.287 | 3.285 | 68.633 | -2.924 | 4.435 | 1081539 |
| Ireland | 649.855 | 2.581 | 3.992 | 54.340 | 1.484 | 2.673 | 4747297 |
| Italy | 833.188 | 2.123 | 3.795 | 31.122 | -6.093 | 1.579 | 4599556 |
| Netherlands | 1254.807 | 3.217 | 13.981 | 20.560 | 5.864 | 8.133 | 6910049 |
| Portugal | 534.669 | 1.920 | 4.332 | 41.091 | 3.800 | 3.969 | 3031108 |
| Spain | 1768.120 | 2.571 | 3.473 | 23.732 | 4.199 | 6.845 | 8001263 |
| Sweden | 267.993 | 2.787 | 4.418 | 33.471 | -18.246 | -10.155 | 959000 |
| Uk | 421.349 | 3.460 | 4.274 | 24.973 | -12.424 | -8.289 | 1011639 |
| Differences | | | | | | | |
|  | MV | PB | DP | PE | ROE | ROIC | ASSETS |
| Austria | 525.262 | 2.180 | -1.101 | 2.791 | 24.397 | 6.100 | 9605432 |
| Belgium | -59.112 | -0.113 | -1.203 | 0.448 | 5.813 | 2.070 | 4973414 |
| Denmark | -175.706 | -0.783 | -1.558 | -3.438 | 9.667 | 4.967 | -945349 |
| Finland | 618.961 | 0.672 | -0.512 | -2.654 | 9.986 | 4.736 | 800491 |
| France | 157.778 | 0.515 | 0.205 | -2.811 | 11.095 | 7.423 | 263075 |
| Germany | 1432.087 | 0.324 | -0.775 | -13.321 | 16.195 | 10.462 | 5120181 |
| Greece | 323.656 | 1.126 | 0.178 | -3.502 | 11.043 | 3.361 | 325365 |
| Ireland | -328.479 | -0.490 | 0.747 | 30.978 | -20.764 | 6.741 | -2622537 |
| Italy | 2229.195 | -0.068 | -0.337 | -5.703 | 15.086 | 4.781 | 8000444 |
| Netherlands | 752.825 | -0.847 | -4.894 | -3.120 | 9.391 | 2.690 | 15489951 |
| Portugal | 152.774 | 0.120 | -0.539 | -18.175 | 7.970 | 4.968 | -1127379 |
| Spain | 2568.626 | 0.444 | 0.319 | -4.586 | 10.186 | 3.541 | 9898737 |
| Sweden | 540.813 | 0.337 | -0.105 | -12.468 | 32.903 | 21.929 | 1757855 |
| Uk | 469.902 | -0.046 | -0.710 | -3.079 | 27.462 | 20.359 | 970497 |
| Average | 657.756 | 0.241 | -0.735 | -2.760 | 12.174 | 7.438 | 3750727 |

**../../../../PUBLICATIONS/AlmostStochasticDominance/submissions/AER/firstround/figure1.emf**

Figure 1. Almost First Order Stochastic Dominance: Consider two cumulative distributions of the high and low return portfolios, H and L. Because of the violation area denoted by “V”, H does not dominate L by FSD, SSD or MV rules. There are some utility functions that give a large weight to area “V” and a very small or zero weight to area “K”, where H is below L. Since almost all investors would prefer portfolio H, almost first order stochastic dominance rule (AFSD) is introduced, which reveals a dominance of H over L despite the fact that area “V” violates FSD.

**../../../../PUBLICATIONS/AlmostStochasticDominance/submissions/AER/firstround/figure2.emf**

Figure 2. Almost Second Order Stochastic Dominance: This figure illustrates a case where H has a much higher mean than L, but due to the negative area within the interval [r1,r2] (i.e., area Q), there is no SSD of H over L. Yet, if area Q is “relatively small” and EH (r)-EL (r) is “relatively large”, ASSD may exist.

1. See for example: Bali, Demirtas, Levy, and Wolf (2009), and Bali, Brown, Demirtas (2013). [↑](#footnote-ref-1)
2. For 128 stocks, there exist a menemonic code but not a DSCD code. [↑](#footnote-ref-3)
3. Each year, stock days with returns lower (higher) than 1(99) percentile are truncated. [↑](#footnote-ref-4)
4. Truncation of market value in US would affect certain stocks like Google and Apple. Analysis of market value distributions in US shows that the market value data is much cleaner than other countries. [↑](#footnote-ref-5)
5. Obviously, there are other methods of obtaining a k-year return series using simulations, such as, drawing from a generalized t-distribution with exactly the same higher order moments of the original series and cumulate the daily returns afterwards. One can also draw several daily observations with replacement and cumulate these daily returns afterwards. However, these methods neglect the natural autocorrelation embedded in the data. Picking a data point randomly and cumulating there onwards preserve the natural autocorrelation. [↑](#footnote-ref-6)
6. Assume we compare Developed and Emerging index at a 3-year investment horizon. First, 1000 observations of 3-year simulated returns are generated for each series. Then a [1000x2] matrix is formed such that each column belongs to a 3-year return series of each index. Minimum and Maximum values of the elements of this matrix is obtained [↑](#footnote-ref-7)
7. Several other precision variables yield similar results. [↑](#footnote-ref-8)