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## Introduction

When is the best time to invest in the stock market? Should you sell in May and go away? Should you avoid investing in September and October? Are January and April the best months to invest? These are the questions everyone wants the answer to. Two people who tried to answer these questions and others were Yale Hirsch in the United States and David Schwartz in the United Kingdom. Both of them made an extensive analysis of temporal patterns in the stock market to determine whether you were better off investing in January or July. They both wanted to know which were the best months? Which were the best weeks or days? Did these patterns change over time?

Yale Hirsch began publishing the *Stock Trader's Almanac* in 1968. The book catalogues day-by-day and month-by-month patterns in the stock market using data from the Dow Jones Industrial Average, S&P 500 and Nasdaq Composite. Hirsch discovered the January Barometer which said that as January goes, so goes the rest of the year, recognized that there was a "Santa Claus Rally," found that November to April were the best six months of the year in the stock market, and noted the impact of the four-year Presidential cycle on the stock market. In the United Kingdom, David Schwartz published the *Stock Market Handbook* which uncovered similar patterns in the London Stock market using monthly data back to 1923 and daily data back to 1935.

What neither of these analysts did was to see how these patterns behaved in different countries over a longer period of time, primarily because they didn't have access to Global Financial Data and its vast collection of historical data on every stock market in the world. We can now use this data to determine whether the temporal patterns that Hirsch and Schwartz discovered in the United States and the United Kingdom exist throughout the world and over time.

### The Database

Global Financial Data has collected monthly and daily data on stocks from 100 countries. The database begins in 1602 for the Netherlands, 1692 for the United Kingdom, 1718 for France, 1792 for the United States and various dates in the 1800s and 1900s for other countries. We have at least 100 years of data for over 20 countries. This allows us to determine which months historically have been the best and worst performers so investors can be aware of the differences in returns. They can then time their investment choices across

dozens of markets to take advantage of good times and avoid bad times.

We have analyzed these returns both by month and by country. Using data on 40 countries allows us to directly compare each of these countries' performance in any given month. What were returns in January across the world compared to other months? Which countries had the best returns? Which had the worst? We can also analyze the returns by country to determine which months had the highest returns and the worst returns.

We can analyze these returns for both the entire period of time for which data are available and since 1900. For many countries, data before 1900 is limited and reflects a limited number of companies. We rely upon securities listed in London as the source of the data for some countries either because there was no listing for the companies domestically, or there was more trading of stocks in London than there was on domestic exchanges.

Before World War I, London provided more liquid financial markets than domestic stock exchanges in emerging markets. The world was financially integrated by the Gold Standard before World War I meaning that a listing in London was often preferable to a listing in Buenos Aires because the London stock exchange was larger and more liquid. Bond coupons and dividend payments were made in multiple currencies since the exchange rates between the primary currencies were fixed to each other by their gold content.

When World War I began, countries went off of the Gold Standard and exchange rates fluctuated. Consequently, the price of a share listed in Paris in French Francs differed from a share listed in London in British Pounds. Before World War I, the only country which provided share indices was the United States through its Dow Jones and New York Times Indices. After World War I, each country began keeping track of the price of shares and reported their indices to the League of Nations. It should be remembered that all of these indices were price indices, not return indices. Return indices weren't even introduced until the 1970s.

For this reason, the historical data we use for the seasonality analysis are based upon price indices and not return indices. The indices calculated by Hirsch and Schwartz were also based upon price indices. If you were to base seasonality analysis on return indices, this would create biases because most companies pay dividends on a quarterly, not a monthly basis. Dividend payments are not spread out evenly over the course of the year, and including dividend payments would provide higher returns in the months in which dividends were paid than in months in which they were not.

Another factor that has to be considered is inflation. Some countries, especially in Latin America, have suffered from high rates of inflation in the double-digit or even triple-digit level over a period of years. This includes Argentina, Brazil, Chile, Colombia, Israel, Peru, Mexico and Venezuela among others. These countries have a higher average return and the months with the highest returns occur during the inflationary periods in those countries.

Just using Brazil as an example, the month with the highest return was April 1990 when the stock market rose 114.25%. There were 26 months in which the stock market rose by more than 50% and 109 months in which the stock market rose by over 20%. On the other hand, the worst performing month in Brazilian history was March 1990 during which the market fell 56.17%. However, there were only 14 months during which the market fell by more than 20%. Contrast this with Switzerland which has only had two months with declines over 20% and only two months with increases over 20% in the past 100 years. Consequently, the years of inflation in Brazil create a very strong bias in favor of the inflationary years.

We eliminated countries that either have a short stock market history and/or are probably excluded from international portfolios because they were small. This left us with 40 countries and 3 regions to analyze. A list of the current indices that are used for each country is provided below:

<b>Country</b>	<b>Index</b>	<b>Begins</b>
Argentina	Buenos Aires SE General Index (IVBNG)	1947
Australia	Australia ASX All-Ordinaries	1840
Austria	Austria Wiener Boerse kammer Share Index (WBKI)	1922
Belgium	Brussels All-Share Price Index	1926
Brazil	GFD Indices Brazil IBV Index	1850
Canada	Canada S&P/TSX 300 Composite	1833
Chile	Santiago SE S&P CLX IGPA	1927
China	Shanghai SE "A" Shares	1990
Colombia	Colombia Colcap Index (with GFD Extension)	1929
Denmark	OMX Copenhagen All-Share Price Index	1873
Finland	OMX Helsinki All-Share Price Index	1912
France	France CAC All-Tradable Index	1801
Germany	Germany CDAX Composite Index	1835
Hong Kong	Hong Kong Hang Seng Composite Index	1964
India	Bombay SE Sensitive Index	1693
Indonesia	Jakarta SE Composite Index	1983
Ireland	Ireland ISEQ All-Share Price Index	1830
Israel	Tel Aviv SE 125 Broad Index	1949
Italy	FTSE Italia All-Share Index	1905
Japan	Tokyo SE Price Index (TOPIX)	1914
Malaysia	Malaysia KLSE Composite	1972
Mexico	Mexico SE Indice de Precios y Cotizaciones (IPC)	1930
Netherlands	Netherlands All-Share Price Index	1919
New Zealand	New Zealand SE All-Share Capital Index	1862
Norway	Oslo SE OBX-25 Stock Index	1914
Peru	Lima S&P/BVL Peru General Index	1933
Philippines	Manila SE Composite Index	1952
Portugal	Oporto PSI-20 Index	1934

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Russia	Russia Moscow Index (MOEX) Composite	1993
Singapore	Singapore FTSE All-Share Index	1965
South Africa	FTSE/JSE All-Share Index	1862
South Korea	Korea SE Stock Price Index (KOSPI)	1962
Spain	Madrid SE General Index	1918
Sweden	OMX Stockholm All-Share Price Index	1901
Switzerland	Switzerland Price Index	1921
Taiwan	Taiwan SE Capitalization Weighted Index	1967
Thailand	Thailand SET General Index	1975
Turkey	Istanbul SE IMKB-100 Price Index	1986
United Kingdom	GFD Indices UK Top 100 Price Index	1692
United States	GFD Indices USA Top 100 Price Index	1792
World	GFD Indices Developed World Price Index	1692
World x/USA	GFD Indices Developed World x/USA Price Index	1792
Europe	GFD Indices Developed World Europe Price Index	1792

With the exception of some of the emerging market countries that just introduced stock market indices recently, virtually all of the indices are combinations of different indices that have been calculated over time. Few of the indices that are used for each country existed over the entire period of time. We had to chain-link different historical indices in order to provide long-term calculations. In many cases, GFD had to calculate indices using data that are included in the Global Financial Database because no one had calculated an index for that country during that period of time. There was insufficient historical data to provide indices back to the 1800s or before unless GFD calculated indices using data on individual stocks. This included Australia, Canada, Denmark, France, Germany, India, Ireland, New Zealand, South Africa, the United Kingdom and the United States. All other countries rely upon indices that were calculated contemporaneously. The indices for the World, World x/USA and Europe were calculated by GFD using data from the indices for each country.

With this data, we provide an analysis by month and by country. The monthly analysis looks at the returns by month in each of the 40 countries and 3 regions, comparing the returns in that month to the average return and to other months. We also provide quarterly analysis to look at the returns over three-month periods of time, for example, between November and January. This enables us to determine which were the best three months and worst three months to invest in each country. We look at

1. Percentage returns by month,
2. Number of months moving up and down
3. Percentage of up and down months

4. Years with the maximum return by month
5. Years with the minimum return by month

For quarterly returns, we look at the first three measures, percentage returns by quarter, number of quarters moving up and down and percentage of up and down quarters, but we do not look at the best and worst quarters.

For each month we provide a “scorecard” which delineates whether that month provided the best or worst performance during the year for any particular country. For example, in January, Denmark, Finland, Germany, Ireland, Italy, Japan, Netherlands, Norway, Spain, Sweden, and Switzerland provided their best returns of any month in the year. Denmark in January 1925, Japan in January 1949 and the World x/USA Index in January 1975 had their best performance of any single month in history. Austria had its worst month in history in January 1938. The United Kingdom in January 1975 and Europe in January 1975 had their best performance of any single month since 1900. Both of those indices had provided higher returns during the South Sea stock market bubble. The Scorecard provides a quick guide to the best and worst performances in any month by country.

If you want to analyze the performance of all of the countries in any given month, you can review the six tables that we provide for that month. We have marked the best returns for any category in green and the worst returns for any category in red. Data calculations go through June 2020.

If you want to analyze returns for a particular country, we provide a similar set of tables for 40 countries and 3 global indices by month. For each country, we first provide a long-term graph of the performance of stocks in that country. We then record which months had the best and worst performance for each category. This analysis includes:

1. Highest and Lowest Monthly Average Increase
2. Greatest Single Monthly Increase and Decrease
3. Highest and Lowest Quarterly Average Increase
4. Highest and Lowest Monthly Average Increase Since 1900
5. Greatest Single monthly Increase and Decrease since 1900
6. Highest and Lowest Quarterly Average Increase Since 1900

This will allow you to quickly find the best and worst performing months for each country and

compare the results with other countries. Between the analysis by month and the analysis by country you will have a complete picture of global monthly and quarterly returns in the past. But as the saying goes, “past performance is no guarantee of future returns.” Nevertheless, this information can aid investors in their investment decisions and give them a better understanding of seasonal patterns in stock market behavior.

Although there is a strong correlation in the relative performance of different stock markets, there are differences because the stocks that trade on each exchange vary. The United States, whose stock market is heavily influenced by technology stocks will perform differently from South African stocks which is weighted toward natural resources.

What we found in our overall analysis of the world’s stock markets was that the international results were similar to the results in the United States and the United Kingdom. What worked in the United States and the United Kingdom generally worked in other countries as well. However, there are subtle differences in the returns. Although a month like October 1987 has more record declines than any other month in history and March 2020 registered a number of record declines for the month of March, there were many other countries where this wasn’t true.

There is enough data on the pages that follow to last a lifetime. There are many ways in which you can use the information in this book. Perhaps you want to move your money around to different ETFs to exploit the seasonal patterns you discover. All of the original data is available from GFD, so if you want to analyze the patterns yourself in detail, feel free to join us.