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The Impact of the Global Economy on the S&P 500[®]

SUMMARY

In this paper, we examine the geographic revenue distribution of the [S&P 500](#) and see what, if any, impact foreign economies and geographically driven market events may have on overall index performance.

We examine a recent market event, the 2016 U.S. election, as a case study. To aid in the analysis, we use two stylized portfolios based on geographic revenue data. The time period studied is from Election Day (Nov. 8, 2016) to year-end 2017, a period of robust performance and record highs for the S&P 500.

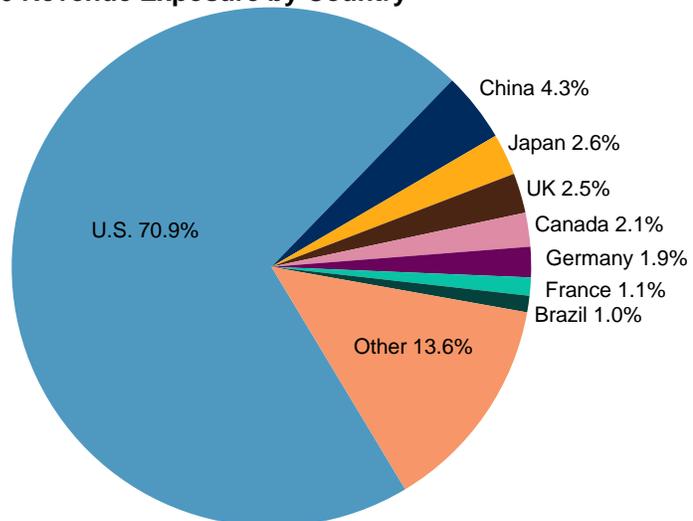
We review the performance of companies in the index through the lens of geographic revenue information. To decompose the performance, we first investigate the potential impact that currency movements may have using the U.S. Dollar Index performance and the Northfield U.S. Macroeconomic Risk Model. We then take a closer look at the individual GICS[®] sectors and run sector-driven performance attributions of the stylized portfolios.

INTRODUCTION – THE S&P 500 HAS GLOBAL EXPOSURE

The S&P 500 is widely considered to be one of the best single gauges for the U.S. equity market. Composed of 500 companies that are domiciled in the U.S., the index captures approximately 82%¹ of the total U.S. equity market value. An index of U.S. companies may lead one to initially assume that the index is exclusively dependent on the health of the U.S. economy. In reality, the index is more global than one may think. Many U.S. corporations have a global presence, with assets and revenues in or from foreign countries. Therefore, certain global events can have a material effect on S&P 500 companies and overall index performance.

To better understand where S&P 500 companies' revenues are coming from, the FactSet Geographic Revenue Exposure (GeoRevTM) dataset was used.² This dataset gives a geographic breakdown of revenues for all companies with available data. This data showed that nearly 71%³ of S&P 500 revenues came from the U.S., while the remaining came from foreign markets. Internationally, the largest individual countries by total revenue percentage included China (4.3%), Japan (2.6%), and the UK (2.5%).

Exhibit 1: S&P 500 Revenue Exposure by Country



Source: S&P Dow Jones Indices LLC and FactSet. Data as of Dec. 29, 2017. Companies without any available geographic data and partial revenues assigned to Unknown/No Operations regions are excluded from the chart. Chart is provided for illustrative purposes.

71% of S&P 500 revenues came from the U.S., while the remaining came from foreign markets.

Given the data shown in Exhibit 1, it is evident that the [S&P 500](#) has material exposures to foreign economies. As such, domestic and global events or policies that change the dynamic between the U.S. and foreign markets can potentially have an effect on the performance of the S&P 500. In the next section, we investigate how the global market exposure of the S&P 500 has affected index performance.

A CASE STUDY OF GEOGRAPHIC EXPOSURE: THE 2016 U.S. ELECTION

A recent event that had a material market impact was the result of the 2016 U.S. presidential election. The election of Donald Trump led many market participants to believe that his proposed economic policies, referred to as Trumponomics, would be swiftly implemented after he took office. During his campaign run, Trump called for tax cuts for individuals and corporations, reduced corporate regulations, increased foreign trade tariffs, and increased defense and infrastructure spending.⁴ These proposals led the market to expect a boon to the overall U.S. economy in the short term; sectors and industries most closely tied to the U.S. economy would especially benefit.^{5,6}

The potential impact that the proposed policies could have on the U.S. economy and foreign trade agreements makes this event a prime example to examine. To test if, in fact, geographic distribution of revenues can affect index performance, we looked at a period from Election Day (Nov. 8, 2016) through year-end 2017. In addition to looking at S&P 500 performance, two subindices of the S&P 500, which sit on opposite ends of the geographic revenue exposure spectrum, are used as additional examples. The first index, the [S&P 500 Focused Foreign Revenue](#)

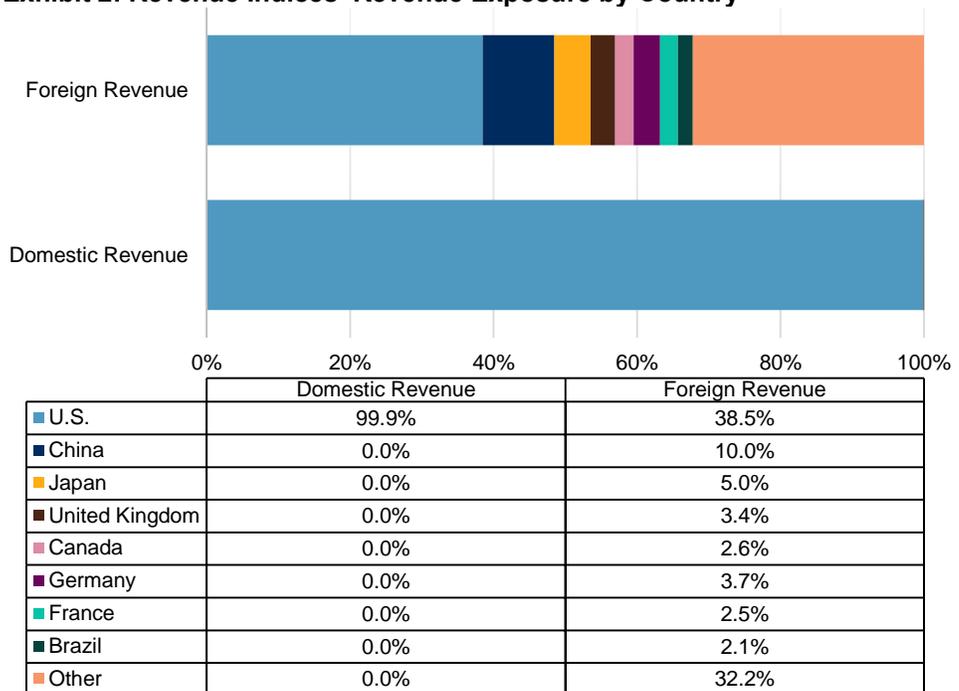
[Exposure Index](#) (referred to as “foreign revenue” and “foreign” in this paper), seeks to measure the top quartile of companies most exposed to foreign markets based on the percentage of total revenue. The second index, the [S&P 500 Focused U.S. Revenue Exposure Index](#) (referred to as “domestic revenue” and “domestic” in this paper), seeks to track the top quartile of companies most exposed to the U.S.

Companies with only domestic revenues would be less affected by international trade agreements and foreign economies compared with multinational corporations. If the proposed policies to be implemented would benefit domestic companies the most, the expectation would be that the domestic index would outperform its foreign counterpart.

While Exhibit 1 shows the aggregate revenue by country of the [S&P 500](#), the distribution for individual companies varies significantly. To illustrate this, the country-level revenue exposures of the two revenue indices were determined. The resulting country exposures for each index shows how different companies on opposite ends of the geographic revenue spectrum actually are (see Exhibit 2). In the foreign index, while the U.S. was still the largest country by geographic source of revenue (38%), it was no longer an overall majority. Approximately 62% of total revenue came from foreign countries, with a notable increase to China (10%). In contrast, the domestic index exposure to the U.S. stayed true to the name; nearly all of the revenue comes from U.S. (99.9%).

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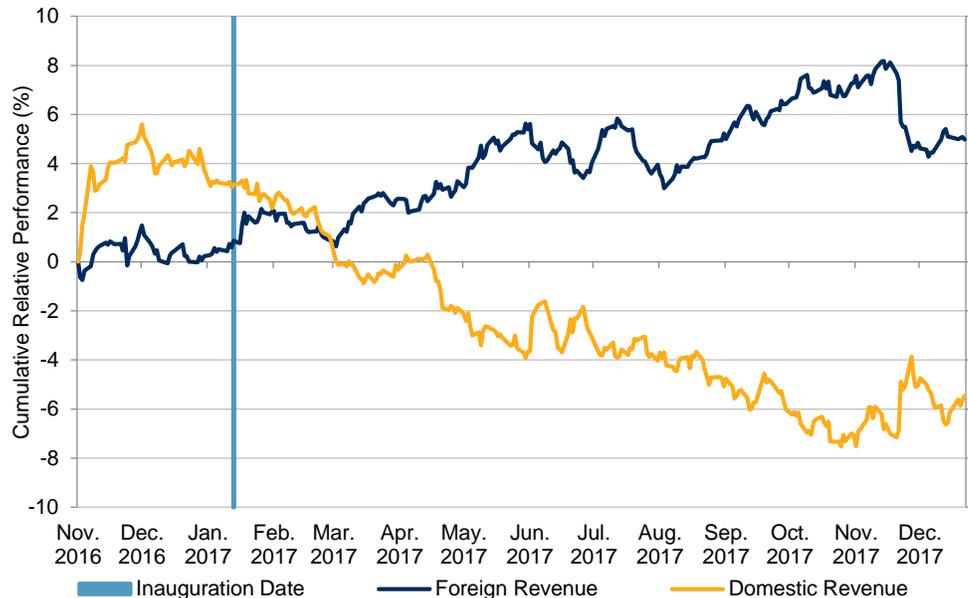
Exhibit 2: Revenue Indices’ Revenue Exposure by Country



Source: S&P Dow Jones Indices LLC and FactSet. Data as of Dec. 29, 2017. Companies without any available geographic data and partial revenues assigned to Unknown/No Operations regions are excluded from the chart. Chart is provided for illustrative purposes.

To understand how the two indices fared compared with the overall [S&P 500](#), the cumulative relative performance of the indices were obtained for the period studied. As anticipated, the domestic index outperformed the foreign index and the S&P 500 by meaningful margins for the immediate months following the election. However, as spring approached in 2017, a reversal occurred, and the foreign index began to outperform the domestic index—a trend that continued through the end of 2017. The domestic index also trailed the S&P 500, falling as much as 7.53% behind the benchmark.⁷ The domestic index rebounded slightly at the end of November 2017, but the portfolio had a cumulative underperformance of 5.47% versus the S&P 500 at year-end 2017. Conversely, the foreign portfolio had an excess return of 4.98% versus the S&P 500—a total performance difference of 10.45% versus the domestic index (see Exhibit 3).

Exhibit 3: Excess Performance Versus the S&P 500 Since the U.S. Election



In a period when the S&P 500 returned 27.9%, an index with the majority of revenue coming from overseas outperformed a U.S.-centric index.

Source: S&P Dow Jones Indices LLC. Data from Nov. 8, 2016, to Dec. 29, 2017. Index performance based on total return in USD. Past performance is no guarantee of future results. Chart is provided for illustrative purposes and reflects hypothetical historical performance. Please see the Performance Disclosure at the end of this document for more information regarding the inherent limitations associated with back-tested performance.

The results may come as a surprise; in a period when the S&P 500 returned 27.9%,⁸ an index with the majority of revenue coming from overseas outperformed a U.S.-centric index.

To decompose the returns of the S&P 500 based on companies’ U.S. revenue exposure, a contribution to return analysis was performed by grouping companies in the S&P 500 into quintiles based on U.S. revenue exposure. The universe was restricted to companies that were in the S&P 500 for the entire period and had available geographic data; companies removed due to one of the above restrictions were placed into the “Other” group and reported separately. Quintile 1 represents the companies with the highest revenue exposure to the U.S., while Quintile 5 represents the companies with the lowest revenue exposure to the U.S. The quintiles

were formed so that each group had a total relative market-cap weight within the eligible universe as close to 20% as possible, as of the period start date. Because the groups were formed so that each had approximately the same total market-cap weight at the start of the period, the security counts for each group differed.

Exhibit 4: Contribution to Return of Securities in the S&P 500

QUINTILE	NUMBER OF SECURITIES	U.S. REVENUE EXPOSURE RANGE (%)	BEGINNING WEIGHT (%)	TOTAL RETURN (%)	CONTRIBUTION TO RETURN (%)
Quintile 1	139	93.7-100.0	20.00	23.40	4.67
Quintile 2	108	70.1-93.5	19.96	31.18	6.15
Quintile 3	103	50.9-70.0	20.10	27.58	5.34
Quintile 4	52	41.1-50.7	19.49	23.99	4.61
Quintile 5	72	0.0-41.0	20.45	33.29	6.65
Total	474	-	100	27.90	27.41
Other	71	-	-	-	0.49
Combined Total	545	-	-	-	27.90

Source: S&P Dow Jones Indices LLC and FactSet. Data from Nov. 8, 2016, to Dec. 29, 2017. Index performance based on total return in USD. Past performance is no guarantee of future results. Table is provided for illustrative purposes and reflects hypothetical historical performance. Please see the Performance Disclosure at the end of this document for more information regarding the inherent limitations associated with back-tested performance.

Companies that had lower exposure to domestic revenues performed better than those with higher domestic revenues.

As shown in Exhibit 4, for the nearly 14-month period, Quintile 1 returned 23.4%, which was the lowest of all groups. The best-performing group during the period was Quintile 5, which contained the securities most exposed to foreign markets. Consequently, the group also contributed the most (6.65%) to the overall [S&P 500](#) total return. Based on the results, companies that had lower exposure to domestic revenues performed better than those with higher domestic revenues. Given the significance of the time period that the study was conducted in, the results merit further investigation. In the following sections, we investigate several potential reasons why companies most exposed to international markets performed the best during the period.

CURRENCY EXPOSURE OF U.S. COMPANIES

Given the country exposures seen in Exhibits 1 and 2, companies with foreign revenues, the vast majority of which use currencies other than the U.S. dollar, may transact in foreign currency for buying or selling goods and services. Conversely, companies with only domestic revenue would have little to no foreign currency exposure.

Companies with foreign sales are naturally exposed to foreign currency risk. Since companies need to translate revenues in foreign currency back to the U.S. dollar for financial reporting, they are exposed to movements in the value of foreign currencies relative to the U.S. dollar, known as translation risk. If the value of the U.S. dollar increases versus a foreign currency, revenues in that foreign currency would be worth less when

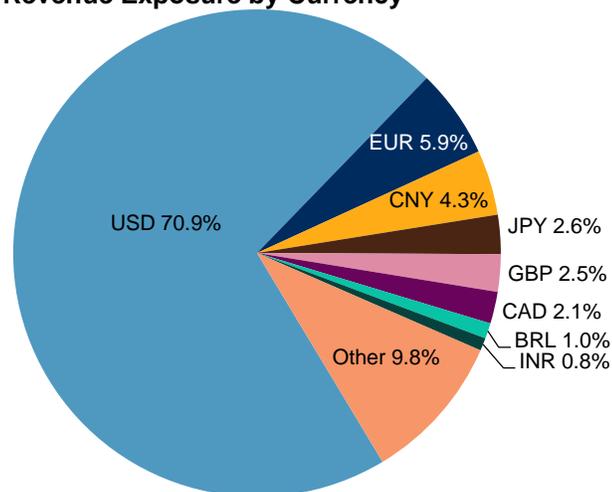
translated back to U.S. dollars. This could potentially lead to a decrease in total sales from expectations for a company. On the other hand, if the U.S. dollar decreases in value relative to a foreign currency, revenues in that currency would be worth more in U.S. dollars, and thus potentially benefit total sales of a company in U.S. dollar terms.

Companies can attempt to mitigate foreign currency risk via currency hedging practices, but hedging isn't perfect. Hedging typically comes with transaction costs, relying on currency movement forecasts and the potential errors that come along with that, and it becomes increasingly complex the more global a company is. A study conducted in 2012 of non-financial, publicly listed U.S. companies with foreign currency revenues showed that about half of firms hedged currency risk.⁹ Some companies may hedge only a portion of their foreign revenues, due to preference or the inability to properly hedge a specific currency.

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Given the diverse mix of countries, it is important to examine the potential foreign currency exposure of the [S&P 500](#), which we determined by mapping the currency used in each country (see Exhibit 5). Several additional observations can be made from the currency-based revenue chart. First, it shows that the euro is the foreign currency the S&P 500 has the most exposure to, coming in at 6%. Second, the chart shows the number and the mix of currencies the S&P 500 has exposure to—six foreign currencies with a total exposure of 1% or more, and 19 currencies coming in at a minimum of 0.25%.

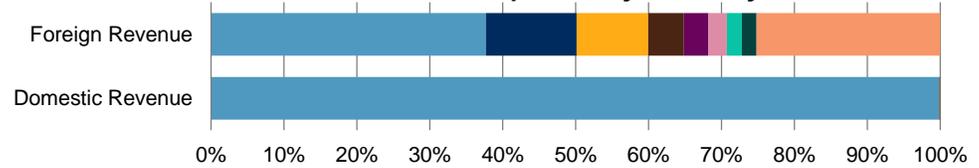
Exhibit 5: S&P 500 Revenue Exposure by Currency



Source: S&P Dow Jones Indices LLC and FactSet. Data as of Dec. 29, 2017. Companies without any available geographic data and partial revenues assigned to Unknown/No Operations regions are excluded from the chart. Chart is provided for illustrative purposes.

The same breakdown was performed for the revenue-based indices (see Exhibit 6). This revealed the significant increase in foreign currency exposure for the foreign index. In fact, just over one-third of total revenues were sourced from countries using the U.S. dollar, while the rest were from markets that use other currencies.

Exhibit 6: Revenue Indices' Revenue Exposure by Currency



	Domestic Revenue	Foreign Revenue
USD	99.9%	38.5%
EUR	0.0%	12.7%
CNY	0.0%	10.0%
JPY	0.0%	5.0%
GBP	0.0%	3.4%
CAD	0.0%	2.6%
BRL	0.0%	2.1%
INR	0.0%	2.0%
Other	0.0%	25.7%

Source: S&P Dow Jones Indices LLC and FactSet. Data as of Dec. 29, 2017. Companies without any available geographic data and partial revenues assigned to Unknown/No Operations regions are excluded from the chart. Chart is provided for illustrative purposes.

We looked at the comparative performance of the revenue indices to the U.S. Dollar Index

To see if the differences in currency exposure had an effect on performance during the period, we performed additional analysis. First, we looked at the comparative performance of the revenue indices to the U.S. Dollar Index. Second, we used a macroeconomic risk model to see the macro factor exposures of the indices, of which one factor was the relative value of the U.S. dollar to other major currencies.

The U.S. Dollar Index, designed to track the relative value of the U.S. dollar to a basket of other major world currencies, was overlaid (plotted on the secondary vertical axis) on the relative performance chart from Exhibit 3 (see Exhibit 7). An increase in index value indicates an increase in the relative value of the U.S. dollar compared with the other major currencies, while a decrease in index value represents a decline in the U.S. dollar.

Exhibit 7: Relative Performance Versus the S&P 500 and the U.S. Dollar Index



Source: S&P Dow Jones Indices LLC and FactSet. Data from Nov. 8, 2016, to Dec. 29, 2017. Index performance based on total return in USD. Past performance is no guarantee of future results. Chart is provided for illustrative purposes and reflects hypothetical historical performance. Please see the Performance Disclosure at the end of this document for more information regarding the inherent limitations associated with back-tested performance.

The results potentially indicate a positive relationship between the domestic revenue index and U.S. Dollar Index, and a negative relationship between the foreign revenue index and U.S. Dollar Index.

Perhaps a reflection of the bullish views of the expected future growth of the U.S. economy, the U.S. Dollar Index rose by 4% in less than two months from Election Day to year-end 2016. However, by early 2017, the index started to decline and trended downward through the end of 2017. In fact, the upward movement at the beginning and subsequent decline through 2017 were similar in magnitude and direction as the relative performance changes of the domestic index. The foreign index however, saw relative performance versus the [S&P 500](#) increase, as the U.S. dollar dropped in value. The results, therefore, potentially indicate a positive relationship between the domestic revenue index and U.S. Dollar Index, and a negative relationship between the foreign revenue index and U.S. Dollar Index.

To better understand the currency risk of the indices beyond tracking their relative performance and currency movements, we used the Northfield U.S. Macroeconomic Equity Risk Model to analyze total portfolio risk. The model makes it possible to understand the macroeconomic risk variables exposures of a portfolio, including a currency factor based on changes in the value of the U.S. dollar. Exhibit 8 breaks down the total risk of the two revenue indices between stock-specific risk and systematic (factor) risk using the S&P 500 as the benchmark. The risk decomposition was run on a monthly basis from November 2016 to December 2017, with the averages of monthly risk statistics shown.

Exhibit 8: Risk Summary of Revenue Indices Versus the S&P 500¹⁰		
RISK FACTOR	FOREIGN REVENUE	DOMESTIC REVENUE
Average Stock-Specific Risk (%)	39.96	25.80
Average Factor Risk (%)	60.04	74.20
AVERAGE FACTOR RISK CONTRIBUTION TO TOTAL RISK (%)		
Credit Risk Premium	0.90	-0.03
Exchange Rate USD	9.32	1.52
Housing Starts	0.46	0.45
Industrial Production	0.04	0.91
Oil Price	4.61	-0.82
Residual Market	1.46	-0.24
Slope Term Structure	4.28	19.33
Unexpected Inflation	3.59	2.25
Blind Factor 2	20.70	5.57
Blind Factor 3	3.02	1.10
Blind Factor 4	7.05	35.34
Blind Factor 5	4.62	8.81

Source: S&P Dow Jones Indices LLC and Northfield Information Services. Data from Oct. 31, 2016, to Dec. 29, 2017. Past performance is no guarantee of future results. Table is provided for illustrative purposes and reflects hypothetical historical performance. Please see the Performance Disclosure at the end of this document for more information regarding the inherent limitations associated with back-tested performance.

The foreign index had a particularly higher stock-specific risk than the domestic index. This indicates that the percentage of total risk that can be explained by the U.S.-based macroeconomic factors in the model was lower. The highlighted factor in Exhibit 8, Exchange Rate USD, shows how much of the expected total portfolio risk was caused by changes in the U.S. dollar value relative to other major world trade currencies.

The results show that the currency risk of the foreign index (9.32%) was considerably higher than the domestic index (1.52%). Thus, changes in the U.S. dollar would have a higher impact on the foreign index than the domestic index. In other words, the foreign index was more sensitive to the strengthening and weakening of the U.S. dollar than the domestic index.

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Next, we reviewed the coefficients to the risk factors for each portfolio. Exhibit 9 reports the average monthly factor returns, average monthly active factor exposures, and resulting contribution to active total returns of the revenue indices relative to the [S&P 500](#).

Exhibit 9: Factor Exposure and Factor Impact¹¹

FACTOR	AVERAGE FACTOR RETURN (%)	FOREIGN REVENUE PORTFOLIO		DOMESTIC REVENUE PORTFOLIO	
		AVERAGE ACTIVE FACTOR EXPOSURE	COMPOUNDED FACTOR IMPACT (%)	AVERAGE ACTIVE FACTOR EXPOSURE	COMPOUNDED FACTOR IMPACT (%)
Credit Risk Premium	0.00	-0.35	0.10	-0.40	-0.04
Exchange Rate USD	-0.42	-0.09	0.30	0.05	-0.23
Housing Starts	2.09	0.01	0.36	-0.02	-0.54
Industrial Production	0.14	0.09	0.11	0.27	0.60
Oil Price	1.99	0.03	0.91	0.00	0.12
Residual Market	0.54	0.10	0.86	-0.08	-0.63
Slope Term Structure	-0.06	1.27	-1.12	-2.90	3.18
Unexpected Inflation	-0.18	0.01	-0.12	0.05	-0.30
Blind Factor 2	0.44	0.16	3.27	-0.17	-3.02
Blind Factor 3	0.04	0.39	0.05	-0.18	-0.05
Blind Factor 4	-0.18	0.17	0.69	-0.76	2.16
Blind Factor 5	-0.04	0.00	0.22	0.23	-0.84

Source: S&P Dow Jones Indices LLC and Northfield Information Services. Data from Oct. 31, 2016, to Dec. 29, 2017. Past performance is no guarantee of future results. Table is provided for illustrative purposes and reflects hypothetical historical performance. Please see the Performance Disclosure at the end of this document for more information regarding the inherent limitations associated with back-tested performance. Average Factor Return and Average Active Factor Exposure is monthly data, while Compounded Factor Impact is the compounded effect of the multiplication of monthly factor returns and factor exposures.

For the 14-month period, the average monthly return for the Exchange Rate USD factor was -0.42%, meaning that holding the U.S. dollar versus holding other currencies would have resulted in negative returns. Relative to the S&P 500, the foreign index had negative active exposure to the

currency factor, while the domestic revenue index had positive active exposure.

Together with the negative return for the U.S. dollar factor during the analysis period, the active exposures of the indices imply that the foreign index, on average, would have had positive returns, with the opposite occurring for the domestic index. The compounded factor impact for each index shows the cumulative effect of the factor exposures on total returns. As expected, the negative exposure of the foreign index to the Exchange Rate USD factor led to a positive contribution to excess returns, while the positive exposure of the domestic index led to a negative contribution to excess returns.

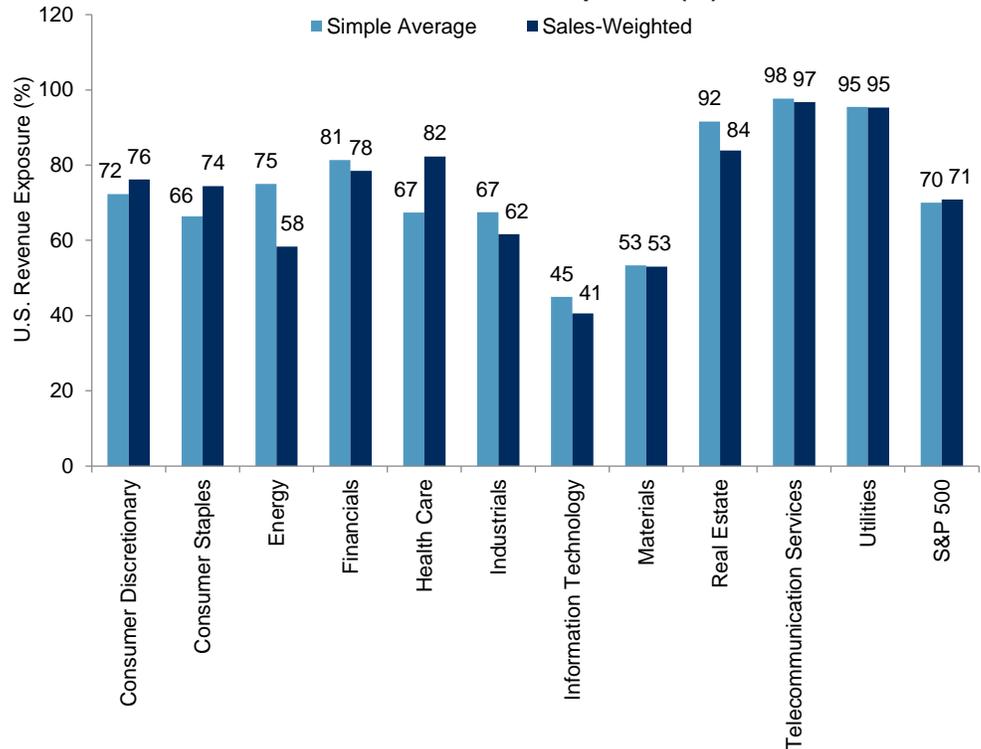
S&P 500 SECTOR ANALYSIS

As mentioned previously, industries and sectors most tied to the U.S. economy were anticipated to be the largest benefactors of the proposed economic policies. Given that each sector is involved in different areas of the U.S. economy, it is of interest to see how each sector differed in terms of geographical revenue exposure. In this section, we first review the revenue exposures of the sectors in the [S&P 500](#) and how they performed during the period, followed by the performance impact sectors had on the revenue indices.

The negative exposure of the foreign index to the Exchange Rate USD factor led to a positive contribution to excess returns.

Sectors with high exposure to the U.S. included real estate, telecommunication services, and utilities, while the information technology and materials sectors were the most exposed to global markets. Exhibit 10 shows the U.S. revenue exposures of each sector computed two ways; the first method is a simple average of the exposures of each stock in the sector, while the second method is the sales-weighted average of the exposures. The second method follows the calculation method used for Exhibit 1.

Exhibit 10: S&P 500 Sectors' U.S. Revenue Exposure (%)



Source: S&P Dow Jones Indices LLC and FactSet. Data as of Dec. 29, 2017. Companies without any available geographic data and partial revenues assigned to Unknown/No Operations regions are excluded from the chart. Chart is provided for illustrative purposes.

The three largest energy companies contributed a large portion of total sales in the sector.

For the most part, the two methods of computing the sector exposures resulted in similar numbers. The energy sector showed the largest difference between the two methods; the three largest energy companies contributed a large portion of total sales in the sector¹² and had relatively lower exposure to the U.S., thereby reducing the sales-weighted sector exposure compared with the simple average. The energy sector appeared to have a higher than average (ranked 5th of 11) exposure to the U.S. by simple average, but in terms of sales-weighted exposure, the sector was lower than average (ranked 9th of 11). The distinction between the two numbers is important in understanding how different sectors affected portfolio performance (more relevant is sales-weighted exposure) compared to from where the average company in each sector obtained revenue geographically (more relevant is simple average exposure).

Given the sector exposures, the S&P 500 Sector Indices were used to determine cumulative performance for each sector throughout the period studied. These slice the [S&P 500](#) into separate sector indices, maintaining the market-cap weighting mechanism. If the proposed economic policies come to fruition, or if there were high confidence in them being implemented in the future, it would be reasonable to expect relatively high performance for the real estate, telecommunication services, and utilities sectors.

The proposed economic policies did not directly translate to outperformance of the sectors most tied to the U.S. economy.

The actual performance of the sectors during the period (see Exhibit 11) demonstrate that in general, the reverse occurred. The three sectors with the highest domestic revenue exposure (highlighted) all trailed the [S&P 500](#) by a meaningful margin. On the other hand, the two sectors most exposed to international markets—information technology and materials—were respectively the second- and third-best-performing sectors. Thus, the proposed economic policies did not directly translate to outperformance of the sectors most tied to the U.S. economy.

Exhibit 11: S&P 500 Sector Performance

SECTOR	TOTAL RETURN (%)	U.S. REVENUE EXPOSURE RANK (SALES-WEIGHTED)	U.S. REVENUE EXPOSURE RANK (SIMPLE AVERAGE)
Financials	42.70	5	4
Information Technology	40.53	11	11
Materials	31.10	10	10
Industrials	30.09	8	7
S&P 500	27.90	--	--
Consumer Discretionary	27.70	6	6
Health Care	23.59	4	8
Real Estate	13.07	3	3
Consumer Staples	12.16	7	9
Utilities	11.86	2	2
Telecommunication Services	11.49	1	1
Energy	7.88	9	5

Source: S&P Dow Jones Indices LLC. Data from Nov. 8, 2016, to Dec. 29, 2017. Index performance based on total return in USD. Past performance is no guarantee of future results. Table is provided for illustrative purposes and reflects hypothetical historical performance. Please see the Performance Disclosure at the end of this document for more information regarding the inherent limitations associated with back-tested performance.

Now, turning to the foreign and domestic revenue indices—since U.S. revenue exposure is used as the basis for constituent selection, an expectation might be that the active sector weights of each revenue index would be in alignment with the average sector revenues in Exhibit 10. Observing the sector weights of the foreign revenue and domestic revenue indices compared with the S&P 500 on Election Day confirmed this (see Exhibit 12). For example, the information technology sector had 42% exposure to the U.S., much lower than the overall S&P 500 (63%). Not surprisingly, there was a large overweight to the sector in the foreign index (15.12% over in active weight), while the domestic index had minimal exposure to the sector (-19.76% active weight).

Exhibit 12: Sector Weights of Revenue Indices on Election Day

SECTOR	FOREIGN REVENUE			DOMESTIC REVENUE		
	PORTFOLIO WEIGHT (%)	S&P 500 WEIGHT (%)	DIFFERENCE (%)	PORTFOLIO WEIGHT (%)	S&P 500 WEIGHT (%)	DIFFERENCE (%)
Consumer Discretionary	11.2	12.22	-1.02	14.58	12.22	2.36
Consumer Staples	8.88	9.98	-1.1	2.19	9.98	-7.79
Energy	9.41	7.24	2.17	9.42	7.24	2.18
Financials	5.29	13.4	-8.11	22.75	13.4	9.35
Health Care	8.24	14.09	-5.85	7.19	14.09	-6.9
Industrials	8.83	10.07	-1.24	5.36	10.07	-4.71
Information Technology	36.6	21.48	15.12	1.71	21.48	-19.76
Materials	10.56	2.83	7.73	1.71	2.83	-1.12
Real Estate	0	2.89	-2.89	13.99	2.89	11.1
Telecommunication Services	0	2.46	-2.46	2.03	2.46	-0.43
Utilities	0.99	3.34	-2.35	19.06	3.34	15.72

Source: S&P Dow Jones Indices LLC. Data as of Nov. 8, 2016. Table is provided for illustrative purposes and reflects hypothetical historical performance. Please see the Performance Disclosure at the end of this document for more information regarding the inherent limitations associated with back-tested performance.

The allocation effect showed the impact of the active sector tilts in each portfolio, while the selection effect demonstrated the impact of security selection within each sector.

Considering their significant differences in sector weights, we investigated whether the performance differential between the two revenue indices was merely a matter of sector tilting. To test this, we conducted a sector-grouped Brinson performance attribution for the study period. Performance attribution is a powerful tool, as it segments out the performance differences between the portfolios and the [S&P 500](#) into an allocation effect and a selection effect. The allocation effect showed the impact of the active sector tilts in each portfolio, while the selection effect demonstrated the impact of security selection within each sector.

Exhibit 13: Sector Attribution Versus the S&P 500

SECTOR	FOREIGN REVENUE				DOMESTIC REVENUE			
	AVERAGE WEIGHT DIFFERENCE (%)	ALLOCATION EFFECT (%)	SELECTION EFFECT (%)	TOTAL EFFECT (%)	AVERAGE WEIGHT DIFFERENCE (%)	ALLOCATION EFFECT (%)	SELECTION EFFECT (%)	TOTAL EFFECT (%)
Consumer Discretionary	-0.54	0	1.21	1.21	2.43	-0.02	-0.77	-0.79
Consumer Staples	0.51	0.13	-0.09	0.04	-6.6	1.03	-0.26	0.77
Energy	0.49	-0.12	-0.26	-0.38	1.62	-0.26	-0.21	-0.47
Financials	-10	-1.26	-0.56	-1.82	7.89	1.16	0.67	1.83
Health Care	-2.44	0.11	0.57	0.68	-6.38	0.2	0.49	0.68
Industrials	-1.61	-0.03	0.36	0.33	-5.7	-0.18	0.45	0.28
Information Technology	11.34	1.11	2.07	3.18	-20.93	-2.24	-0.25	-2.49
Materials	9.28	0.34	0.57	0.91	-1.38	-0.09	-0.31	-0.4
Real Estate	-2.53	0.38	0.02	0.41	12.61	-1.77	-1.06	-2.83
Telecommunication Services	-2.25	0.37	0	0.37	-0.44	0.04	-0.65	-0.61
Utilities	-2.26	0.35	-0.2	0.15	16.87	-2.22	0.73	-1.49
TOTAL	-	1.38	3.7	5.08¹³	-	-4.36	-1.17	-5.52¹⁵

Source: S&P Dow Jones Indices LLC. Data from Nov. 8, 2016, to Dec. 29, 2017. Table is provided for illustrative purposes and reflects hypothetical historical performance. Please see the Performance Disclosure at the end of this document for more information regarding the inherent limitations associated with back-tested performance.

We can make several conclusions from the sector performance attribution. First, the foreign revenue index benefited from sector tilts and security selection. However, the majority of the excess return versus the [S&P 500](#) came from the selection effect. Second, the underperformance of the domestic revenue index stemmed from the attribution and selection effects, in near equal proportion. The results give a clear picture that the performance differences were not just due to over- and under-weighting sectors in the S&P 500. Rather, both active sector weights and security selection based on revenue exposure data contributed to the results.

CONCLUSION

Despite being a barometer of the domestic equity market, the S&P 500 has more exposure to the global economy than one may initially expect. Thus, market events both domestic and abroad can have an effect on the companies in the index.

We used the 2016 U.S Election and the subsequent months to demonstrate the impact of revenue exposure on companies that derive their sales from abroad. The market event studied in this paper demonstrated that allocating to the sectors or industries based on the expectations of benefiting the most from the economic policies proposed by Trump would not have been rewarding in relative performance terms. In fact, the opposite would have been true. In a period of strong returns and numerous record highs for the S&P 500, some of the main contributors were the companies and sectors most exposed to foreign economies.

Despite being a barometer of the domestic equity market, the S&P 500 has more exposure to the global economy than one may initially expect.

Therefore, geographic revenue data can aid in understanding potential unintended country or currency exposures of a portfolio. The difference in performance of the foreign and domestic revenue indices demonstrated that incorporating geographic revenue data in the investment process can have a material impact. Additionally, from a portfolio construction standpoint, if an investor has a particular view of an economy and wants to translate that view into a portfolio, a “purer” market portfolio could be constructed by using the revenue data in allocations or security selection.

Geographic revenue data can aid in understanding potential unintended country or currency exposures of a portfolio.

ENDNOTES

- 1 Source: S&P Dow Jones Indices LLC. Calculation as of Dec. 29, 2017.
- 2 More information on the dataset can be found at https://www.factset.com/data/company_data/geo_revenue.
- 3 Source: FactSet, as of Dec. 29, 2017. Done on a simple average basis, another common approach to compute geographic revenue exposure of a portfolio, total exposure to the U.S. was approximately 70%.
- 4 Source: Irwin, Neil and Rappeport, Alan. "[Donald Trump Adopts G.O.P. Tax Cuts, but Balks at Trade Pacts](#)." Aug. 8, 2016.
- 5 Source: "[A Shifting Global Economic Landscape](#)." *World Economic Outlook Update*. January 2017.
- 6 Source: Thomas Jr., Landon. "[Why Stock Markets, Initially Shaken, Went Up After Trump's Victory](#)." Nov. 8, 2016.
- 7 Source: S&P Dow Jones Indices LLC. The date of maximum underperformance was Nov. 1, 2017.
- 8 Source: S&P Dow Jones Indices LLC. Data from Nov. 8, 2016, to Dec. 29, 2017. Performance based on total return in USD.
- 9 Source: Ryan, Vincent. "[Only Half of Companies Hedging Currency and Other Risks](#)." Oct. 17, 2013.
- 10 The model provides a monthly based analysis; therefore, the start date is Oct. 31, 2016, as opposed to Nov. 8, 2016.
- 11 The model provides a monthly based analysis; therefore, the start date is Oct. 31, 2016, as opposed to Nov. 8, 2016.
- 12 As of Dec. 29, 2017, the three largest companies in the energy sector made up approximately 47% of total global sales of the sector and had an average revenue exposure to the U.S. of 32%.
- 13 Due to slight differences in calculation mechanisms, the total effect, which in turn was the excess return of each portfolio versus the benchmark, did not exactly match the returns shown in Exhibit 13.

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PERFORMANCE DISCLOSURE

The S&P 500 Focused Foreign Revenue Exposure Index and the S&P 500 Focused U.S. Revenue Exposure Index were launched on Aug. 31, 2017. All information presented prior to an index's Launch Date is hypothetical (back-tested), not actual performance. The back-test calculations are based on the same methodology that was in effect on the index Launch Date. Complete index methodology details are available at www.spdji.com.

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Past performance of the Index is not an indication of future results. Prospective application of the methodology used to construct the Index may not result in performance commensurate with the back-test returns shown. The back-test period does not necessarily correspond to the entire available history of the Index. Please refer to the methodology paper for the Index, available at www.spdji.com for more details about the index, including the manner in which it is rebalanced, the timing of such rebalancing, criteria for additions and deletions, as well as all index calculations.

Another limitation of using back-tested information is that the back-tested calculation is generally prepared with the benefit of hindsight. Back-tested information reflects the application of the index methodology and selection of index constituents in hindsight. No hypothetical record can completely account for the impact of financial risk in actual trading. For example, there are numerous factors related to the equities, fixed income, or commodities markets in general which cannot be, and have not been accounted for in the preparation of the index information set forth, all of which can affect actual performance.

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