

# Market Review

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## Eurozone equity markets: Portugal, Ireland, Italy, Greece and Spain

The European debt crisis has recently dominated the news, causing speculation over whether the common currency will disintegrate or certain developed Eurozone nations will be downgraded to emerging markets status. The developed Eurozone nations that are most affected are Portugal, Ireland, Italy, Greece and Spain, which are often dubbed the “PIIGS” (or “GIIPS” or “GIPSI”).<sup>2</sup> They have had in common high levels of government debt, high public-sector spending, recently low GDP, high labor costs, high unemployment, banking sector problems and, most importantly, the inability to inflate their way out of debt.<sup>3</sup> Despite recent positive economic indicators in parts of the Eurozone periphery,<sup>4</sup> the PIIGS remain a matter of concern and interest among observers around the world.

In this analysis, we examine the PIIGS equity markets as represented by the Russell Portugal Index, Russell Ireland Index, Russell Italy Index, Russell Greece Index and Russell Spain Index, and we compare them to the Russell Global Index (RGI) and the Russell Developed Eurozone Index<sup>5</sup> (RDEZ). We find that although the PIIGS have generally experienced elevated risk and reduced return, they vary widely in terms of

<sup>1</sup> The author would like to thank Mary Fjelstad, Sarah Orzell and Mat Lystra for their contributions to this research.

<sup>2</sup> The acronym “PIGS” appears to have been first used in 1997 by Daniel Vernet in an article in *Le Monde* to describe Portugal, Italy, Greece and Spain. The term only came into wide usage during the global financial crisis, at which point Ireland was added, making the acronym “PIIGS”.

<sup>3</sup> Normally, a country can “inflate its way out of debt” by printing money and decreasing the real value of its debts. This strategy is not available to the PIIGS, however, because of their participation in the common currency they do not have independent monetary policies.

<sup>4</sup> Fiscal Monitor Update, June 2011. IMF. June 17, 2011. Available at [www.imf.org](http://www.imf.org).

<sup>5</sup> The constituents of the Russell Developed Eurozone Index as of June 29, 2011 are Austria, Belgium, Germany, Spain, Finland, France, Greece, Ireland, Italy, Luxembourg, the Netherlands, and Portugal.

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characteristics such as size, style and sector weights. In addition, individual PIIGS' equity markets have varied in both their riskiness and their performance.

Our paper is organized as follows. First we examine the characteristics of the PIIGS' equity markets – total returns, cap size distribution, style, market size and sector weights – as represented by Russell country-level indexes. Next we examine correlations between the PIIGS' equity markets and global and regional markets. Finally, we look at the PIIGS' risk and return, delving into the PIIGS' cumulative performance, risk (as interpreted by an analysis of risk/return profiles) and Sharpe ratios.

We find that:

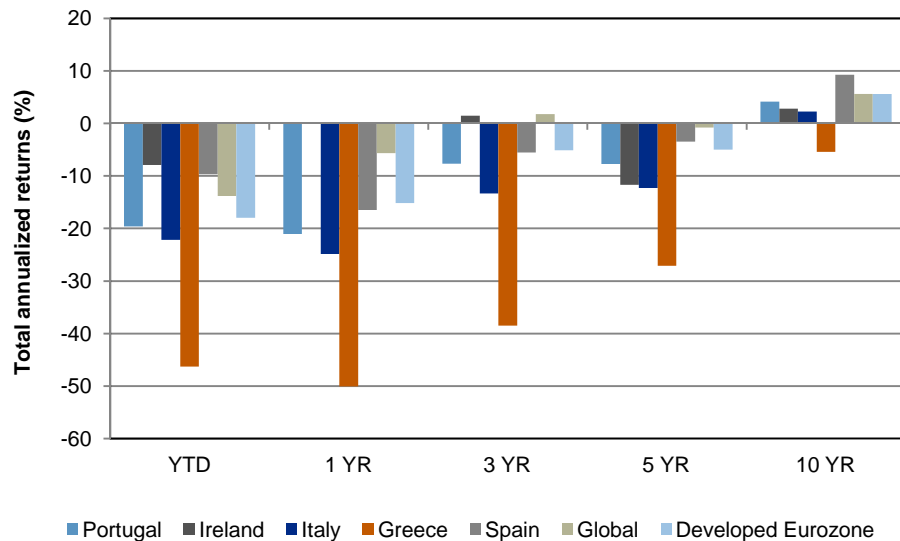
- Although the PIIGS have experienced similar economic conditions and financial problems, their equity markets are distinct, as evidenced by their varied cap and style distributions. The PIIGS markets as a group have collectively lost weight, as measured by float-adjusted market capitalization (market cap), in the developed Eurozone.
- Sector weights in the PIIGS markets have undergone some shifts over the past year, but many sectors continue to be a drag on performance, as several of the PIIGS markets were overweight to sectors that underperformed relative to the Russell Global Index.
- Returns correlations among the PIIGS markets were perhaps not as high as observers may have expected a priori, suggesting that the “PIIGS” label has not necessarily induced high returns correlations among the PIIGS markets. We find that the markets of geographically proximate countries in the developed Eurozone have tended to have more highly correlated returns.
- The PIIGS' cumulative performance remained low relative to global and Eurozone comparisons, but the Russell Spain Index has outperformed other Eurozone and global indexes in most periods over the last 10 years.
- All of the PIIGS markets except Spain presented lower returns and higher or comparable risk than their comparison indexes. A graphical analysis shows that the PIIGS have not compensated investors well for risk.
- The PIIGS' Sharpe ratios confirm that over the last year, five years and 10 years, the PIIGS have compensated investors poorly for risk by producing either low or negative ratios.

## The PIIGS: signs of a crisis

For investors and managers who do not have extensive exposure to the European debt crisis, it may seem that the PIIGS crisis has no relevance to their portfolios and strategies. However, the fate of the PIIGS' economies could have far-reaching effects. Since April 2011, the risk of the crisis spreading to other Eurozone countries has increased; and if the worst-case scenario were to come to pass, world markets could be affected. Corporations and advanced nations could experience decreased funding, while emerging markets could experience a notable decrease in capital flows.<sup>6</sup>

As Figure 1 shows, all is not well in the Eurozone. We see that for the year to date, all of the PIIGS markets and the RDEZ and RGI indexes have yielded negative total returns. Greece has delivered the worst negative performance this year at -46.30%, and Ireland has presented the least negative returns at -7.91%. Additionally, we see that the Russell Greece Index is the only index depicted in Figure 1 to have delivered negative returns for every period considered. Over the last 10 years, all indexes except Greece have produced positive returns. Over the past one, three and five years, Greece has had negative returns exceeding -27% (hitting -50.06% over the last year), representing the worst performance of the group. We see that the PIIGS markets began to experience negative returns even before the onset of the financial crisis (four years ago), and that this negative performance has continued through the end of the financial crisis (two years ago).

**Figure 1 / PIIGS total annualized returns in USD over time compared to the RGI and RDEZ as of 9/30/11**



Source: Russell Indexes

<sup>6</sup> "World Economic Outlook Update: An update of the key WEO projections." IMF. June 17, 2011. Available at [www.imf.org](http://www.imf.org).

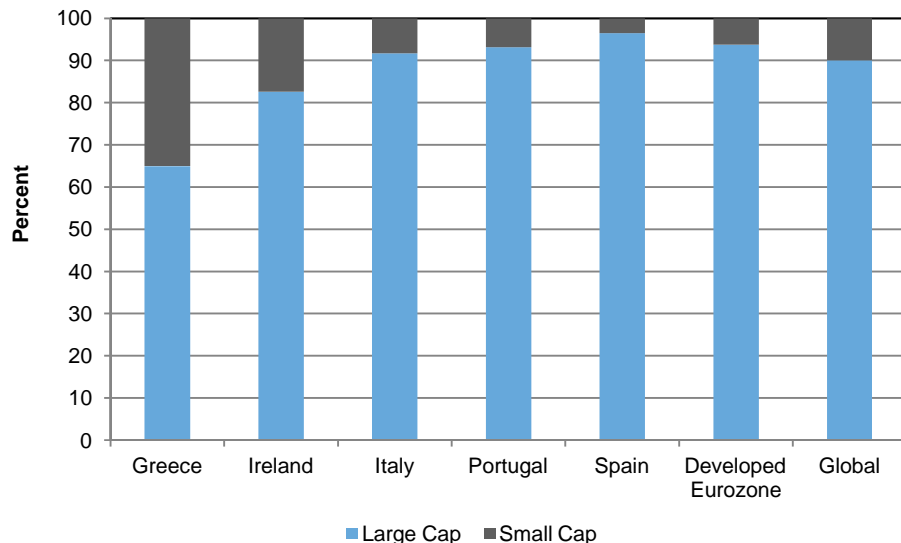
## Country profiles

By analyzing the PIIGS equity markets' characteristics in terms of style, cap size, sector weights, country weights in Developed Eurozone, performance and riskiness, we find that the PIIGS are rather dissimilar bedfellows.

### Company size distribution

Figure 2 illustrates how the PIIGS markets compare to each other and to Russell's Global and Eurozone comparison indexes in terms of cap size distribution. As of September 30, 2011, the global average for capitalization distribution was approximately 10% small cap/90% large cap,<sup>7</sup> while the Developed Eurozone Index's cap distribution was approximately 6% small cap/94% large cap. Greece was much more tilted toward small cap than were the Global or Developed Eurozone indexes or any of the other PIIGS, with 35.05% small cap (64.95% large cap) as of September 30, 2011. Ireland was the next-most small cap-tilted, at 17.36% small cap (82.64% large cap) as of September 30, 2011. Spain was tilted toward large cap stocks, with a small cap percentage of only 3.51% (96.49% large cap). Portugal's and Italy's tilts were comparable to that of the Developed Eurozone as of September 30, 2011.

**Figure 2 / PIIGS cap distribution as compared to the RGI and RDEZ as of 9/30/11**



Source: Russell Indexes

<sup>7</sup> As a result of its research into the global cap-size effect, Russell implemented a global-relative methodology when constructing its Global Large Cap, Global Mid Cap and Global Small Cap indexes, beginning with the June 2007 reconstitution. This approach differs fundamentally from the current industry practice of determining cap size on a country-by-country basis, where companies with very different market capitalizations may be classified in the same cap-size index, or, alternatively, where companies with similar market capitalizations may be classified in different cap-size indexes simply because they are located in different countries or regions. Cap-size indexes constructed by use of country-relative distinctions can generate substantial overlap when combined into broader indexes, reducing their ability to accurately represent what they originally intended to measure.

All of the PIIGS except Portugal and Spain shifted toward small cap stocks between September 2010 and September 2011 (see Table 1). Greece experienced the largest shift, becoming approximately 6.82 percentage points (pp) more oriented toward small cap. Italy became 1.22pp more oriented toward small cap. Portugal, Ireland and Spain experienced almost negligible shifts – Portugal and Spain toward large cap, Ireland toward small cap – of less than 1pp.

**Table 1 / Change in small cap tilt between 9/30/10 and 9/30/11**

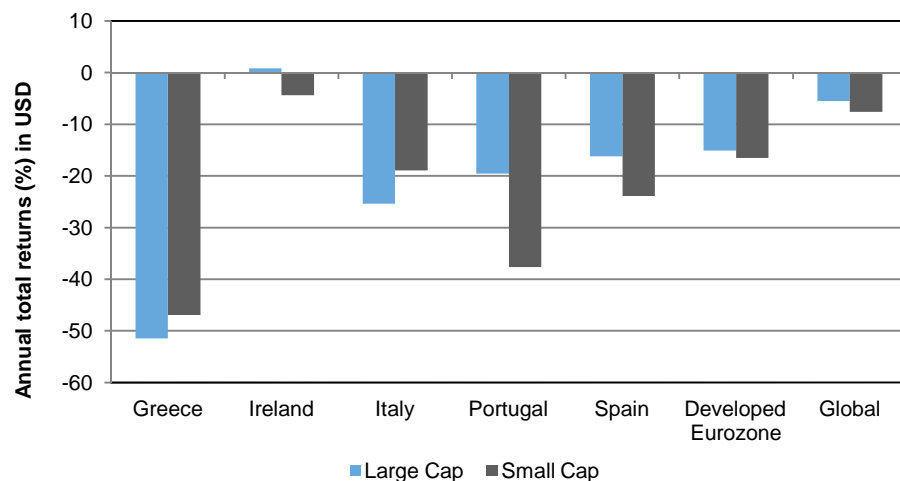
	Difference (pp)
Greece	6.82
Ireland	0.06
Italy	1.22
Portugal	-0.53
Spain	-0.03
Developed Eurozone	-0.03
Global	-0.42

Source: Russell Indexes

In Figure 3 we see how the PIIGS' large and small cap indexes performed over the 12 months between the end of September 2010 and the end of September 2011. Globally in the RGI and regionally in the RDEZ, small cap stocks underperformed large cap stocks. Italy, Portugal and Spain followed this trend, with small caps underperforming large caps. In Greece and Italy however, the small cap premium was positive over this 12-month period.

For the RGI and RDEZ and for all of the PIIGS except Ireland, both large and small cap stocks delivered negative returns. In Ireland, large cap stocks achieved a barely positive performance with an annual return of +0.86%. As Figure 2 shows, Greece was the PIIGS country with the highest proportion of small cap stocks, which may have helped its annual returns, since Greek small cap outperformed Greek large cap (returns in Greece to both large and small cap were strongly negative, however).

**Figure 3 / One-year annual returns by cap size as of 9/30/11**



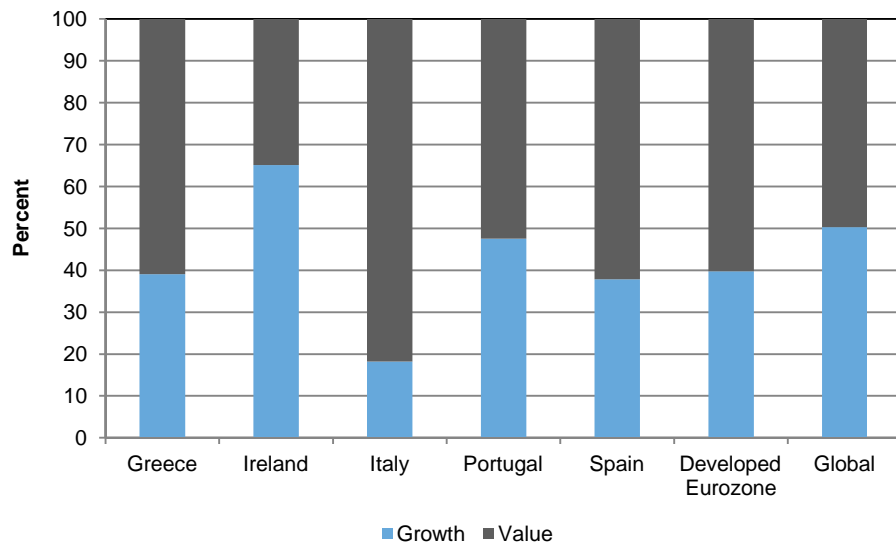
Source: Russell Indexes

### Style distribution: growth and value

Figure 4 shows the PIIGS' tilts toward growth and value as compared to global and Eurozone style comparison indexes. As of September 30, 2011, the global norm as measured by the RGI for style distribution was an approximately 50%/50% split between growth and value, and the Developed Eurozone Index was approximately 60% value/ 40% growth (see Figure 4).

As of September 30, 2011, all of the PIIGS except Ireland were more than 50% tilted toward value, which is unsurprising, considering that the Developed Eurozone as a whole was more than 50% tilted toward value. Ireland had the highest tilt toward growth, at 65.12% (34.88% value). Portugal was the closest to the global distribution of 50% growth/50% value. Spain and Greece were the most closely aligned with the RDEZ, with value tilts within 2pp of the RDEZ's value tilt. Italy had highest value tilt, at 81.83%.

**Figure 4 / PIIGS style distribution as compared to the RGI and RDEZ as of 9/30/11**



Source: Russell Indexes

Between September 30, 2010 and September 30, 2011, several of the PIIGS experienced large shifts in their style distributions (see Table 2). Three of the PIIGS – Spain, Greece, and Portugal – became less tilted toward value over the last year (as did the Developed Eurozone). Spain had the largest change in terms of magnitude, becoming almost 15pp less tilted toward value between September 30, 2010 and September 30, 2011. Greece featured the second-largest change by magnitude, becoming 7.4pp less tilted toward value. Of all of the PIIGS, Ireland had the smallest change in its style distribution, becoming 1.04pp less tilted toward growth.

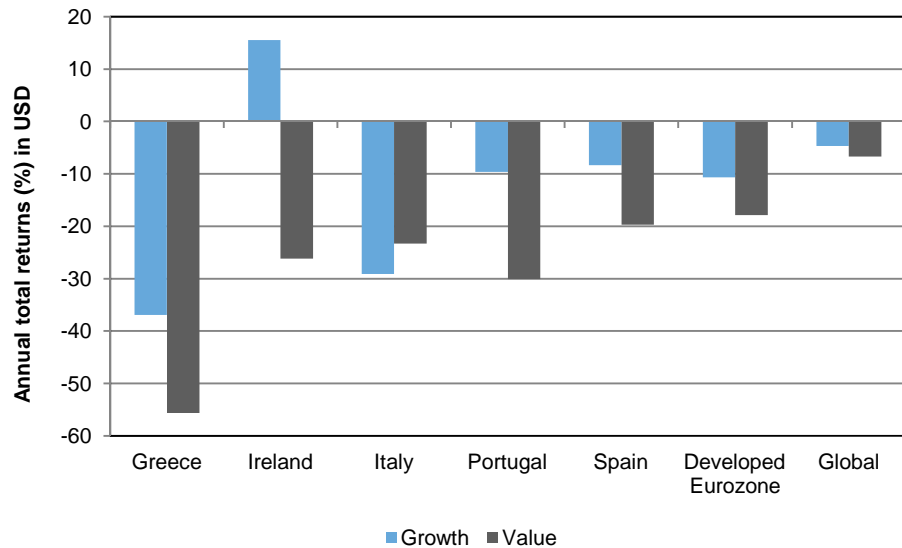
**Table 2 / Change in value tilt between 9/30/10 and 9/30/11**

	Difference (pp)
Greece	-7.38
Ireland	1.04
Italy	7.26
Portugal	-2.12
Spain	-14.96
Developed Eurozone	-3.51
Global	0.54

Source: Russell Indexes

In Figure 5 we compare one-year returns by style. In all of the PIIGS markets except Italy, growth outperformed value. In Italy, value outperformed growth. In Ireland and Portugal especially, growth notably outperformed value. Both styles were strongly negative in Greece, which is consistent with Greece's low overall performance. In both of the comparison indexes – the RGI and RDEZ – growth outperformed value, and both styles delivered negative returns over our period of analysis.

**Figure 5 / One-year annual returns by style as of 9/30/11**

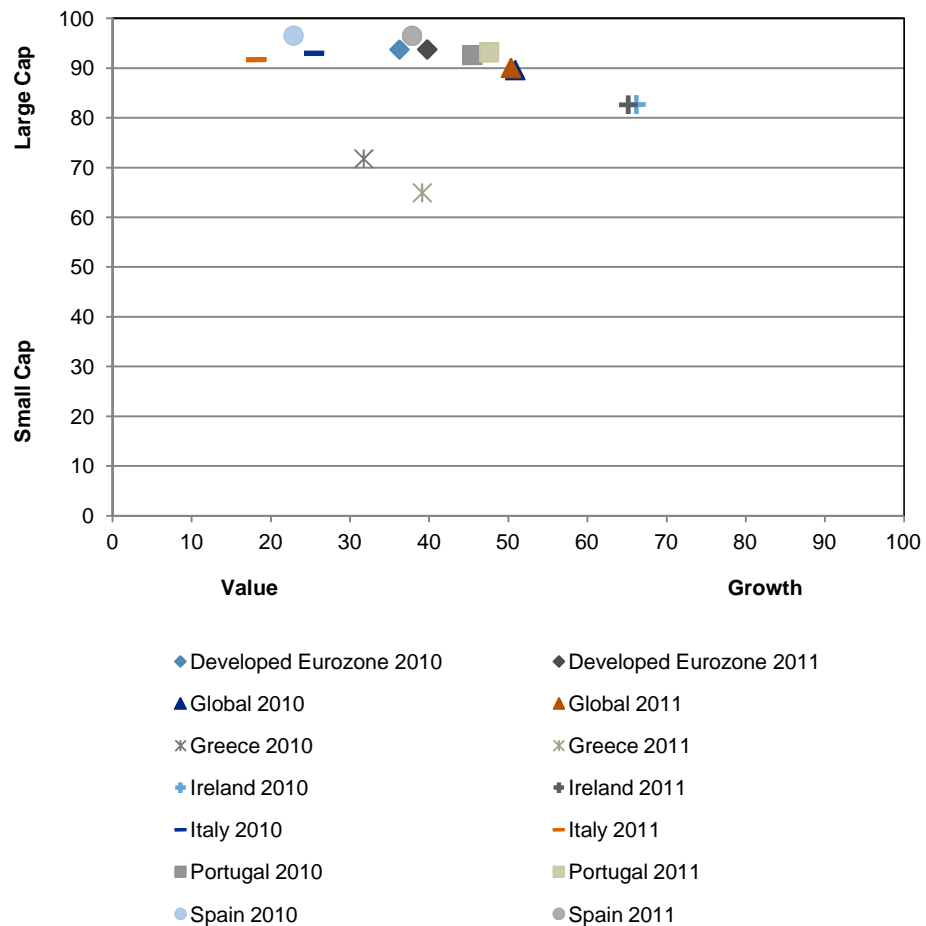


Source: Russell Indexes

### Cap and style distribution combined

Figure 6 illustrates the PIIGS' cap and style distributions relative to each other as of September 30, 2010 and September 30, 2011. This style map summarizes our findings from the previous sections. The PIIGS were strongly tilted towards large cap value stocks (with the exception of Ireland, which was tilted toward large cap and growth in both 2010 and 2011). Greece has experienced a remarkable shift between September 2010 and September 2011, becoming notably more growth-oriented as well as more tilted toward small cap. Spain also presented a large shift toward growth between September 2010 and September 2011, but its large cap/small cap proportions remained approximately the same. Portugal and Ireland remained very similar in terms of size and style between September 2010 and September 2011, and Italy showed only a moderate shift toward value.

**Figure 6 / Style map: style and size comparison as of 9/30/10 and 9/30/11**



Source: Russell Indexes

## Region profile

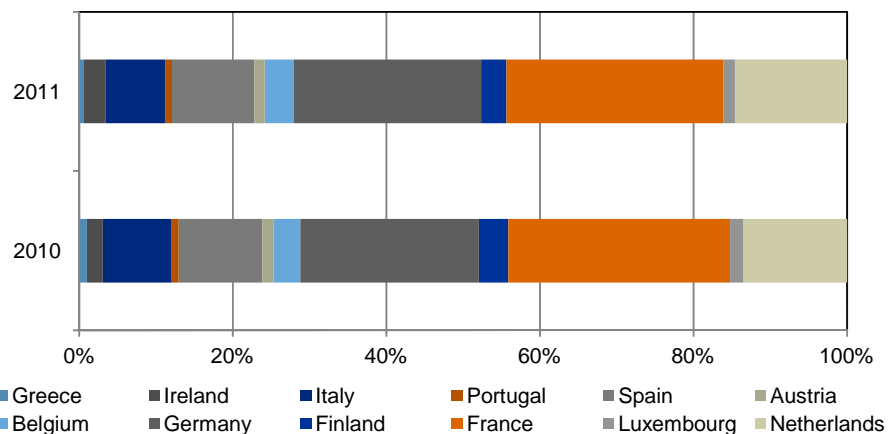
In this section we examine the country weights of the developed Eurozone equity market as a whole, as represented by the Russell Developed Eurozone Index. In Figure 7 we see that the country weights in the Developed Eurozone changed only slightly between September 2010 and September 2011. Germany was the biggest “winner,” gaining approximately 1.20pp, followed by the Netherlands, which gained approximately 1.13pp. Italy was the biggest “loser,” losing approximately 1.12pp. We note that all of these changes are minor.

We see in Figure 7 that some of the PIIGS’ equity markets are comparatively small by market cap<sup>8</sup> relative to other Eurozone countries; Greece was the smallest constituent of the Russell Developed Eurozone Index in 2011, at 0.65%. Greece and Portugal each represented less than 1%, while Ireland represented less than 3% of the Developed Eurozone Index.

Despite three of the PIIGS’ small sizes relative to Developed Eurozone peers, the PIIGS as a group accounted for almost a quarter of the RDEZ in September 2011 (see Figure 8). Spain and Italy were the largest PIIGS countries in the Developed Eurozone Index, at 10.69% and 7.83%, respectively. As of September 30, 2011, Spain was the fourth-largest country in the Russell Developed Eurozone Index, and Italy was the fifth largest, exceeded only by France, Germany and the Netherlands (see Figure 7). While some of the most infamous PIIGS’ equity markets are actually quite small relative to the RDEZ, other PIIGS are in fact noteworthy equity markets within the developed Eurozone. Germany’s market cap alone, however, exceeded the PIIGS’ collective market cap. In other words, the PIIGS were noteworthy in size as of September 2011, but they have not been the only force influencing developed Eurozone equity markets.

We also see that between September 2010 and September 2011 the PIIGS as a whole lost approximately –1.07pp in market cap. Most of this loss can be accounted for by Italy’s –1.12pp loss; however, Spain, Greece and Portugal also lost weight. Ireland was the only PIIGS member with increased index weight between September 2010 and September 2011, gaining 0.69pp.

**Figure 7 / The RDEZ country weights by market cap as of 9/30/10 and 9/30/11**



Source: Russell Indexes

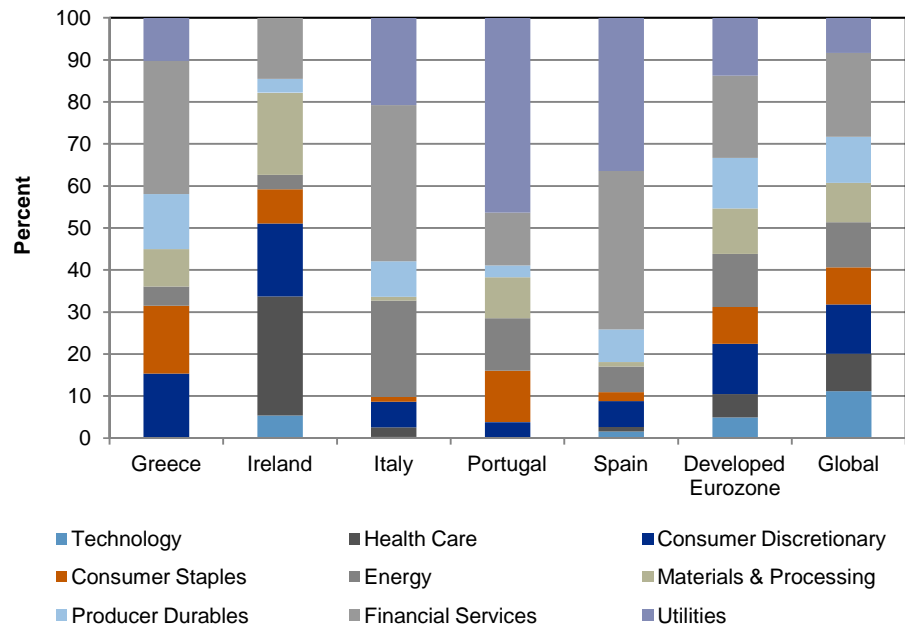
<sup>8</sup> All cap measures are float-adjusted unless otherwise noted.

## Sector profile

We now turn to a comparison of the PIIGS' sector weights to the Russell Global and Developed Eurozone indexes as of September 30, 2011. We analyze changes in the PIIGS' sector weights over time (between September 2010 and September 2011).

In Figure 8 we observe that for some of the PIIGS, in some sectors no companies fit the criteria for inclusion in the RGI as of September 30, 2011; thus, some of the PIIGS appear to be "missing" some sectors. Ireland was missing Utilities, and Greece and Portugal were missing Technology and Health Care. For five of the seven indexes (including Global and the Developed Eurozone), the Financial Services sector was the largest by weight. For Ireland, the Health Care sector was the largest and in Portugal the Utilities sector was the largest, but Financial Services remained an important sector in both countries with a weight of approximately 14.50% for Ireland and 12.61% for Portugal. Although Financial Services was an important sector for all of the PIIGS, the PIIGS' sector weights were far from identical.

**Figure 8 / PIIGS sector weights compared to RGI and RDEZ as of 9/30/11**



Source: Russell Indexes

In contrast to the Global sector weights, which hardly changed between September 2010 and September 2011, the PIIGS' sector weights experienced notable changes, with large weight losses concentrated in Financial Services (see Table 3). Greece's Financial Services sector had the largest weight loss of all of the PIIGS' sectors, losing -12.58pp. In fact, each of the PIIGS' Financial Services sectors lost more than -4pp between September 2010 and September 2011: Developed Eurozone Financial Services lost -3.63pp, while Global Financial Services lost only -1.87pp. Financial Services lost approximately -6.37pp in Ireland and approximately -4.86pp in Italy. Of the PIIGS, only Ireland (14.50%) and Portugal (12.61%) had lower Financial Services weights than the Global Financial Services weight of 19.96%, making all other PIIGS overweight to Financial Services relative to the RGI.

Gains were spread out over the remaining sectors. The sector with the largest gain was Ireland's Health Care, which gained approximately 6.25pp. Ireland went from having an almost nonexistent Technology sector in September 2010 to becoming overweight Technology relative to the Developed Eurozone Index, with a gain of approximately 5.12pp. Notable gains in other sectors were all less than 3pp, with the exceptions of a 4.72pp gain in Portugal's Consumer Staples sector and the aforementioned 5.12pp gain in Ireland's Technology sector.

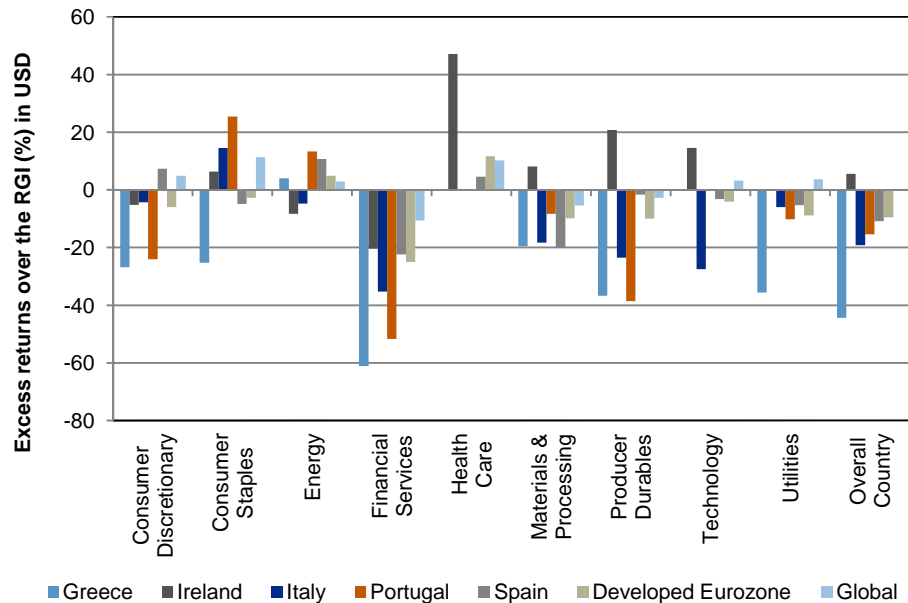
**Table 3 / Changes in sector weights between 9/30/10 and 9/30/11 in pp**

	Technology	Health Care	Consumer Discretionary	Consumer Staples	Energy	Materials & Processing	Producer Durables	Financial Services	Utilities
Greece	0.00	-1.33	2.49	4.84	1.82	2.52	1.73	-12.58	0.50
Ireland	5.12	6.25	-4.56	-0.75	2.48	0.68	0.03	-6.37	-2.89
Italy	0.09	0.50	-2.31	-0.62	1.90	0.02	2.86	-4.86	2.42
Portugal	0.00	0.00	-0.55	4.72	2.80	2.91	-1.75	-5.76	-2.37
Spain	0.38	0.27	1.31	0.75	0.67	0.01	0.02	-4.12	0.71
Developed Eurozone	0.64	1.01	0.24	0.90	1.32	0.07	0.11	-3.63	-0.67
Global	-0.08	0.68	0.45	0.66	0.58	-0.57	-0.33	-1.87	0.48

Source: Russell Indexes

In Figure 8 we saw that relative to the RGI, the PIIGS as a group were heavily slanted toward Financial Services over the year between September 2010 and September 2011. In Figure 9 we see that Global Financial Services underperformed relative to RGI over the last year, as did the Financial Services sectors for each of the PIIGS nations.

**Figure 9 / Excess returns to RGI over the last year by sector as of 9/30/11**



Source: Russell Indexes

## Correlation

What relationships exist among the PIIGS? Do their equity markets tend to move as one group, or do they move with the equity markets of other Eurozone nations? Table 4 shows the PIIGS' correlations with each other, France, Germany and the Eurozone in general. We see that correlations range from 0.74 to 0.99. For the purposes of this analysis, we consider correlations of 0.89 and below to be "low" and correlations of 0.90 and above to be "high."

In Table 4 we see that PIIGS performances were more correlated with certain countries than with others, but that in general they were less correlated with each other. For example, Greece and Ireland had the lowest correlation, of 0.74. Greece and Ireland are geographically far apart and, according to current economic theory, less likely to trade with each other.<sup>9</sup> Spain and Portugal, however, which share a border, had a correlation of 0.90, and Spain and Italy, which are also neighbors, had a correlation of 0.93. Despite these high correlations between Spain and Italy and Spain and Portugal, the correlations of the returns of Ireland and Portugal, Greece and Portugal, and Ireland and Spain, among other combinations, were relatively low over the sample period.

Some of the bigger economies' returns were closely correlated with the Developed Eurozone Index's returns, which intuitively makes sense, given that a high weight in terms of market cap is an important factor in determining return contribution. France, for example, which Figure 5 shows to be the largest Developed Eurozone constituent country (at approximately 30% of the RDEZ as of September 30, 2011), had a correlation of 0.99 with the Developed Eurozone, the highest correlation on the table. Germany, which Figure 5 shows to have the second-highest-weight in the Developed Euro Zone (24.4%) as of September 30, 2011, had a correlation of 0.98 with the Developed Eurozone.

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<sup>9</sup> The gravity model holds that countries that are geographically close to each other trade more than distant countries. Specifically, it holds that the volume of trade between two countries decreases as the distance between them (and barriers to trade) increase(s).

See Brun, Jean-François, Céline Carrère, Patrick Guillaumont and Jaime de Melo (2005): "Has Distance Died? Evidence from a Panel Gravity Model." *World Bank Economic Review* 19(1): 99–120.

Are the PIIGS' returns highly correlated with other key Eurozone countries? We see in Table 4 that France's returns had a correlation of 0.92 with Portugal, 0.83 with Ireland, 0.97 with Italy, 0.92 with Spain and only 0.85 with Greece. It is worth noting that France is geographically close to Spain, Italy and Portugal. Germany's returns were less than 90% correlated with all PIIGS countries – except Italy, with which it shared a correlation of 0.94. This result is upheld by empirical trading statistics; the IMF finds that northern European nations have tended not to have strong trade ties with the PIIGS.<sup>10</sup> For example, Germany, Sweden and Switzerland sell less than 6% of their collective total exports to Greece, Ireland, Portugal and Spain combined – this figure is two to three times *less* than the share of Germany's, Sweden's and Switzerland's exports to regions such as central Europe, eastern Europe or even emerging Asia.<sup>11</sup>

**Table 4 / Five-year correlations (October 2006–September 2011) – PIIGS plus representative countries, based on monthly returns**

	Developed								
	Portugal	Ireland	Italy	Greece	Spain	Global	Eurozone	France	Germany
Portugal	1.00	0.77	0.91	0.84	0.90	0.86	0.92	0.92	0.86
Ireland	0.77	1.00	0.84	0.74	0.75	0.89	0.86	0.83	0.82
Italy	0.91	0.84	1.00	0.89	0.94	0.92	0.98	0.97	0.94
Greece	0.84	0.74	0.89	1.00	0.86	0.84	0.88	0.85	0.83
Spain	0.90	0.75	0.94	0.86	1.00	0.85	0.93	0.92	0.88
Global	0.86	0.89	0.92	0.84	0.85	1.00	0.96	0.94	0.95
Developed Eurozone	0.92	0.86	0.98	0.88	0.93	0.96	1.00	0.99	0.98
France	0.92	0.83	0.97	0.85	0.92	0.94	0.99	1.00	0.96
Germany	0.86	0.82	0.94	0.83	0.88	0.95	0.98	0.96	1.00

Source: Russell Indexes. Created with MPI Stylus™

<sup>10</sup> World Economic and Financial Surveys, Regional Economic Outlook: Europe Strengthening the Recovery. IMF. May 2011. Available at [www.imf.org](http://www.imf.org).

<sup>11</sup> Ibid.

## Risk/return profile

In this section we analyze the PIIGS markets' returns relative to global and Eurozone comparison markets, focusing on their risk/return profiles (standard deviation compared to returns) and Sharpe ratios.

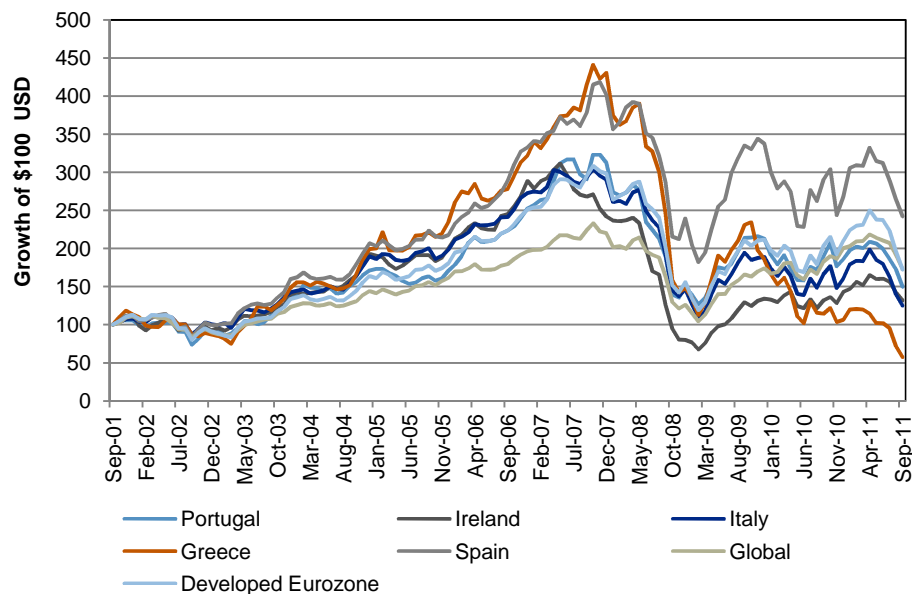
### Return – performance

A priori, based on the extensive media attention emphasizing the PIIGS' insolvency and economic woes, one might expect to find that the PIIGS have demonstrated severe underperformance relative to other markets and to our comparison indexes. We find, however, that the PIIGS' returns vary from country to country. In Figure 10 we compare the PIIGS' returns to both the Russell Developed Eurozone Index and the Russell Global Index. We look at the PIIGS' cumulative returns using a base value of 100.00 in USD as of September 30, 2011.

We see that after an initial dip in cumulative returns, all markets experienced growth until approximately December 2007, at which point their returns dropped off – dramatically, in some cases. Between first quarter 2009 and fourth quarter 2009, performances rallied, only to fall again. Ireland was the exception; it rallied starting in March 2009 and has continued on an upward trend since then.

By the end of August 2009, the Russell Spain Index had begun to outperform the other PIIGS indexes on a cumulative basis; Spain continued to outperform as of September 2011. Until May 2008, the RGI was the worst performer of the group of indexes, but starting in July 2008 Ireland became the lowest performer. In May 2010, Greece surpassed Ireland as the lowest performer. Since April 2011, the indexes in Figure 10 have been on a downward trend, with Greece falling below the \$100 base level to end the third quarter of 2011 with a cumulative return of \$57.24. Interestingly, Greece was the top performer between November 2005 and August 2006 and between April 2007 and January 2008.

**Figure 10 / PIIGS performance – cumulative returns, 9/30/2001 to 9/30/11**



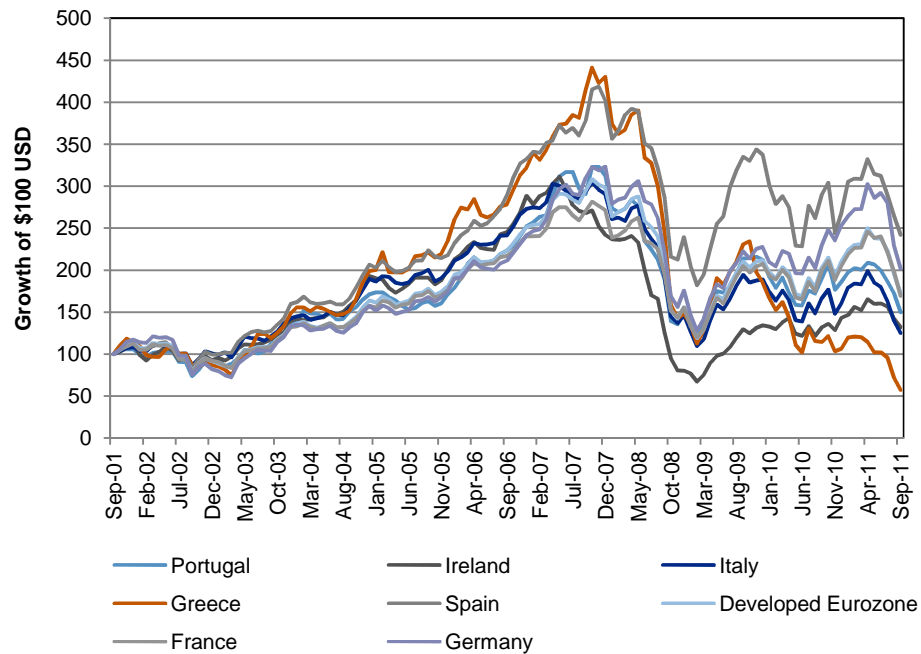
Source: Russell Indexes

In Figure 11 we expand our analysis of the PIIGS' performance by comparing them to two other Eurozone countries: France and Germany. We analyze the PIIGS relative to these two countries because France and Germany are both important members of the Eurozone not only in terms of equity market size but also in terms of their political clout. Germany represents a relatively "safe" developed Eurozone nation; France is the largest Developed Eurozone Index member by market cap, but its banks have ties to PIIGS countries, making some analysts worry that France could be the next country to be affected.

We find that including Germany and France does not change the top or bottom rankings over the period of analysis; as of September 30, 2011, Spain was the highest performer on a cumulative basis, even when stacked up against Germany and France. However, Germany was the second-highest performer as of September 30, 2011. France also outperformed all of the PIIGS except Spain as of September 30, 2011. The Figure 10 indexes have been on a downward trend on a cumulative basis since April 2011. In Figure 11 we find that Germany and France are no exceptions; after the uncertainty and fears of the spring and summer, France and Germany's cumulative performances have also been decreasing since April 2011.

Interestingly, in Figure 11 we also see that the Russell Developed Eurozone Index's performance has closely matched France's performance since September 2001. The only notable difference in their cumulative returns occurred between January 2007 and August 2008, when the Developed Eurozone outperformed France on a cumulative basis by over \$13 each month. But outside of this period between January 2007 and August 2008, the Developed Eurozone has mimicked France's cumulative performance remarkably closely.

**Figure 11 / Eurozone performance – cumulative returns as of 9/30/11<sup>12</sup>**



Source: Russell Indexes

<sup>12</sup> The RGI is omitted from this chart for simplification reasons.

### Risk – analysis of risk compensation

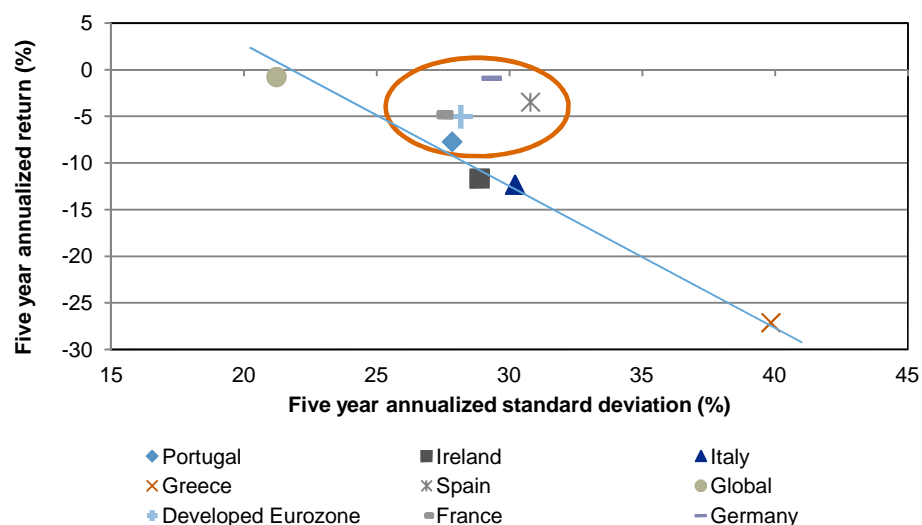
In this section, we analyze the PIIGS markets' riskiness relative to each other and to Eurozone and global equity markets. Figure 12 compares the risk and the returns of the PIIGS' five-year performance ending September 30, 2011, with Germany (a relatively "safe" developed Eurozone nation) and with France (an important but potentially troubled developed Eurozone nation). We also include the RDEZ and RGI as regional and global comparison indexes.

The RGI had the second-highest annualized return of the indexes in Figure 12 but the lowest risk. We see that most of the indexes were clustered around  $-5.0\%$  annualized return and  $29.0\%$  annualized standard deviation, or risk, over the past five years (the orange circle in Figure 12). In this circle we see Germany, with the highest return of the group but higher risk than the RGI; Portugal, with the lowest return of the circled group and one of the higher risk measurements; the RDEZ; France; and Spain. Spain had the highest risk of the circled group, with  $30.78\%$  annualized standard deviation. Despite recent press that emphasizes uncertainty regarding France's financial stability, its risk/return profile remains within the same group as Germany and the RDEZ.

There were several outliers from this circled group. Ireland and Italy remained outside the cluster with  $28.87\%$  and  $30.20\%$  annualized standard deviation, respectively, and with  $-11.66\%$  and  $-12.31\%$  annualized return, respectively. However, the most striking story was Greece. At  $-27.11\%$  annualized return and  $39.83\%$  annualized standard deviation, the Russell Greece Index represented the PIIGS market with the highest risk as well as the lowest return.

Portugal, Italy, Ireland and Greece fell on the same negative trend line (the left-to-right diagonal line in Figure 12), which indicates both increasing risk and decreasing returns. Portugal had the lowest risk and the highest return, and Greece had the highest risk and the lowest return. Of the five PIIGS, Spain was the outlier of this line, with approximately the same risk as Italy and Ireland but a much higher return. Interestingly, France was close to lying on the same risk/return line. The Russell Global and Developed Eurozone indexes were also fairly close to the line, with only Spain and Germany deviating substantially.

**Figure 12 / Risk/return profile from 10/31/06 to 9/30/11 (USD)**



Source: Russell Indexes. Created with MPI Stylus™

The risk/return scatter plot in Figure 12 is one approach for assessing the relationship between risk and return. In Table 5 we present a second measure, the Sharpe ratio<sup>13</sup>, to quantitatively measure how investors have been compensated for risk. We measure the PIIGS' Sharpe ratios over the one-, five and 10-year periods ending September 30, 2011.

Over the last year, which has been characterized by poor performance by Greece and Italy but positive performance by Spain, Ireland and Portugal, all indexes in Table 5, except Ireland, negatively compensated investors for risk (i.e., had negative Sharpe ratios). Over the last five years – the same time period as that in Figure 12 – all of the indexes except for the Russell Germany Index negatively compensated investors for risk. However, the only index to negatively compensate investors for risk over the past 10 years was Greece. This result makes sense in the context of the relatively favorable global economy prior to the financial crisis; as Figure 1 shows, over the last 10 years, all of the indexes except the Russell Greece Index, the Russell Developed Eurozone Index and the Russell Global Index posted positive returns. The Russell Greece Index was the only index to have a negative Sharpe ratio over all three time periods.

**Table 5 / Sharpe ratios: risk-adjusted return in USD as of 9/30/11**

	Sharpe ratio past year	Sharpe ratio past 5 years	Sharpe ratio past 10 years
Portugal	-0.75	-0.21	0.21
Ireland	0.09	-0.34	0.16
Italy	-0.70	-0.34	0.13
Greece	-1.58	-0.62	-0.06
Spain	-0.39	-0.02	0.40
Global	-0.27	-0.01	0.29
Developed Eurozone	-0.48	-0.10	0.27
France	-0.46	-0.10	0.26
Germany	-0.30	0.06	0.33

Source: Russell Indexes. Calculated using MPI Stylus™

<sup>13</sup> The Sharpe ratio is defined as portfolio return minus the return of a risk free asset, divided by the standard deviation of the portfolio excess return over the risk free asset. Here the risk-free asset is defined as the return of the Merrill Lynch 3-Month T-Bill Total Return Index.

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## Conclusion

This analysis has found that the PIIGS' equity markets have generally presented signs of elevated riskiness and of poor returns, but that their risk, return and other characteristics, including size, style and sector weights, have varied widely from each other. In other words, the PIIGS have not been a unified group; rather, they have shared economic woes, but their situations are distinct. All five PIIGS have suffered from the fallout of the financial crisis, but their experiences have been very different. Portugal, for example, did not suffer a housing bubble. However, due to similar problems – high public-sector spending, high unemployment and banking sector issues – Portugal, Ireland, Italy, Greece and Spain have been grouped together as if similar political and economic conditions indicate that the PIIGS are identical in all ways.

Throughout this analysis, we have seen that Spain's equity market has demonstrated relatively high returns and an acceptable risk/return profile compared to those of the other PIIGS markets. However, although Spain's situation has demonstrated some positive characteristics per this analysis, the outlook for some of the other PIIGS, including Greece and Portugal, has not looked as positive. We have found that Greece has delivered particularly low total returns, low risk-adjusted returns and a poor risk/return profile. This analysis has found that, in general, the equity markets of Portugal, Ireland, Italy, Greece and Spain have presented higher risk and lower returns than their Eurozone peers.



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