MSCI Barra
RESEARCH BULLETIN

What Drives Long-Term Equity Returns? | January 2010

Introduction

In this Research Bulletin, we analyze long run returns of international equity markets using historical data spanning the 1975 - 2009 period. We decompose these returns into components and analyze their evolution over time.

This topic has been studied in the past. For example, Ibbotson and Chen (2003) provide a good overview of various decomposition methods and apply them to the US market. However, in our study we use a similar method and present the results using an international view.

Decomposition of the MSCI World Index

We decompose the equity total return (geometric average) into inflation, dividends, and real capital gain. The real capital gain is further broken down into real book value (r.BV) growth and growth in the price to book (PB) ratio. By using book value rather than earnings, we avoid periods with negative earnings where decomposition would not be meaningful. This method is summarized by the following formula:

$$TotalReturn = Inflation + g(PB) + g(r.BV) + DivIncome + Res$$

Residual interactions (*Res*) account for the geometric interaction between the various components when they are compounded over several periods. This term is small compared to the other four. For simplicity, this study ignores the effect of the exchange rates.

First, we decompose the MSCI World Index gross returns from the viewpoint of a US-based investor. The performance is expressed in US Dollars and we measure inflation by US domestic inflation. The results are presented in Exhibit 1.

Exhibit 1: Components of the MSCI World Index gross returns and their volatilities, 1975-2009 and subperiods

Period	1975 - 2009	1975 - 1979	1980 - 1989	1990 - 1999	2000 - 2009	volatility 1975 - 2009
Gross Index Return (USD)	11.1%	16.0%	19.9%	12.0%	-0.2%	14.9%
Inflation (USD)	4.2%	8.1%	5.1%	2.9%	2.6%	1.3%
Price to Book Growth	1.5%	2.3%	8.0%	5.0%	-8.3%	14.0%
Real Book Value Growth	2.1%	0.2%	2.1%	1.4%	3.8%	5.6%
Dividend Income	2.9%	4.6%	3.6%	2.1%	2.2%	0.4%
Residual Interactions	0.4%	0.7%	1.2%	0.5%	-0.5%	0.3%

Source: MSCI Barra and OECD (inflation data); annualized values. Data as of September 30, 2009.

The MSCI World Index annualized gross index return for the total 35-year time span was 11.0%. The biggest component of this return was inflation at 4.2%, contributing more than one third of the total return. Other important components were dividend income (2.9%), emphasizing the importance of dividend reinvestment in long-term investing, and real book value growth (2.0%). Price to book growth contributed the least (1.5%).

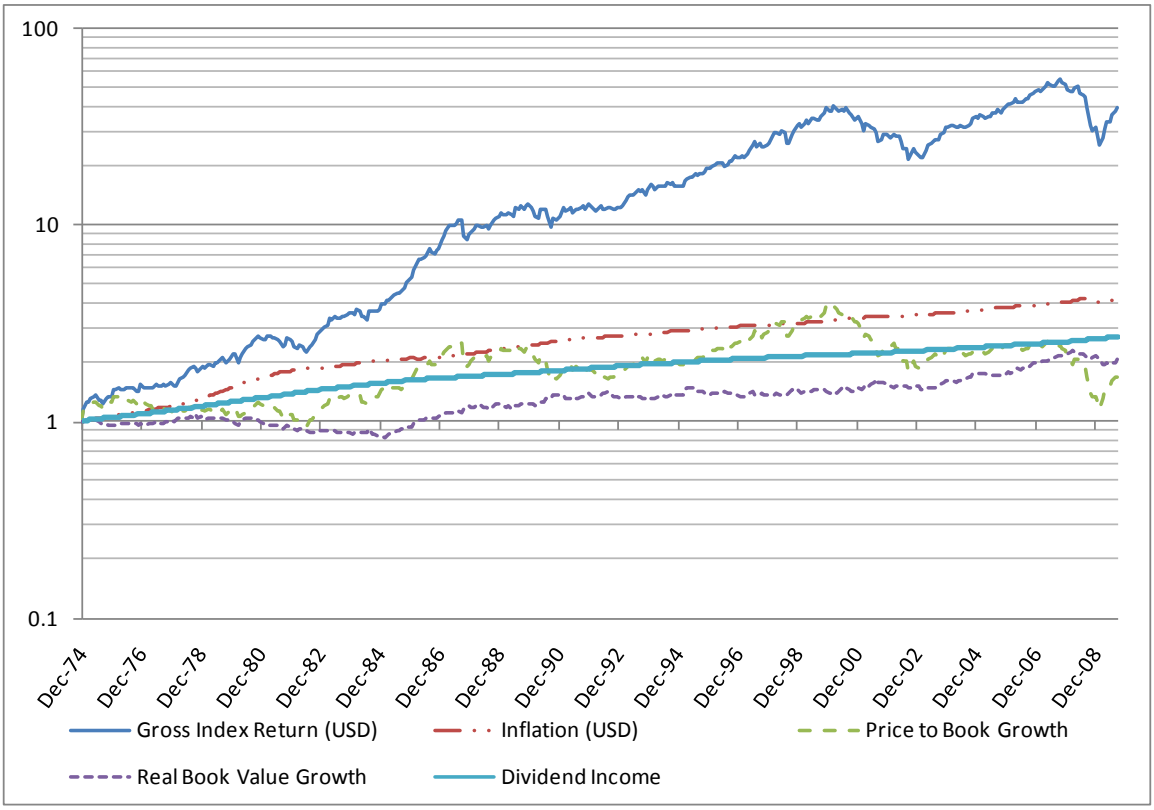
When looking at the sub-period breakdown of the return components, interesting patterns emerge. Dividend income was on a downward trend, declining from 4.6% in the 1970s to 2.2% in the current decade. The relatively small effect of the valuation (PB) change in the long run hides a

very volatile history: in the last three decades, it was the most important component of equity returns, expanding annually by 8% in the 80s, 5.0% in the 1990s and shrinking by 8.4% in the last decade.

This behavior can also be seen in Exhibit 2, which shows the cumulative contribution of the different return components over time. While inflation, dividend income, and book value present steady growth (barring a slight decline in real book value growth in the early 1980s), the price to book value component represents the source of volatility in the overall equity return.

This observation is also confirmed by the last column of Exhibit 1, where we see the annualized volatilities of the different return components for the complete period. Indeed, the volatility of the PB growth component is 14.0%, just slightly below the overall volatility of 14.9%.

Exhibit 2: Cumulative return of the components of the MSCI World Index (gross), 1975-2009



Source: MSCI Barra and OECD (inflation data). Data as of September 30, 2009.

Decomposition of regional returns

We now apply the same decomposition method to the gross returns of five regional and country indices, expressed in their home currency[1]: MSCI USA, MSCI Japan, MSCI Europe, MSCI Australia, and MSCI UK. The results are presented in Exhibit 3.

[1] Before the inception of Euro in 1999, we use DEM and German inflation for Europe.

Exhibit 3: Components of regional gross index returns and their volatilities, 1975-2009 and sub-periods

	Period	1975 - 2009	1975 - 1979	1980 - 1989	1990 - 1999	2000 - 2009	volatility 1975 - 2009
MSCI USA	Gross Index Return (USD)	**11.4%**	**13.3%**	**17.1%**	**19.0%**	**-1.9%**	**15.4%**
	Inflation (USD)	4.2%	8.1%	5.1%	2.9%	2.6%	1.3%
	Price to Book Growth	1.7%	0.7%	6.0%	10.4%	-9.9%	15.6%
	Real Book Value Growth	1.8%	-0.7%	0.6%	2.2%	4.2%	4.5%
	Dividend Income	3.2%	4.8%	4.6%	2.5%	1.8%	0.4%
	Residual Interactions	0.5%	0.4%	0.9%	1.0%	-0.6%	0.4%
MSCI Europe	Gross Index Return (EUR/DEM)	**10.7%**	**11.2%**	**18.3%**	**16.1%**	**-2.0%**	**16.6%**
	Inflation (EUR/DEM)	2.7%	4.1%	2.8%	2.6%	2.1%	1.0%
	Price to Book Growth	2.3%	3.2%	7.9%	8.2%	-9.2%	16.1%
	Real Book Value Growth	1.7%	-1.7%	2.3%	2.0%	2.6%	5.7%
	Dividend Income	3.6%	5.4%	4.2%	2.7%	3.0%	0.6%
	Residual Interactions	0.4%	0.3%	1.0%	0.8%	-0.5%	0.3%
MSCI Japan	Gross Index Return (JPY)	**5.2%**	**13.5%**	**22.3%**	**-4.0%**	**-4.7%**	**18.3%**
	Inflation (JPY)	1.8%	6.6%	2.3%	1.1%	-0.2%	1.9%
	Price to Book Growth	-0.8%	3.6%	9.7%	-6.6%	-6.9%	18.9%
	Real Book Value Growth	2.9%	0.4%	7.7%	0.9%	1.4%	5.2%
	Dividend Income	1.3%	2.4%	1.2%	0.8%	1.3%	0.4%
	Residual Interactions	0.1%	0.5%	1.4%	-0.2%	-0.2%	0.4%
MSCI Australia	Gross Index Return (AUD)	**14.3%**	**25.8%**	**17.8%**	**10.6%**	**9.1%**	**18.4%**
	Inflation (AUD)	5.5%	11.1%	8.3%	2.3%	3.2%	1.3%
	Price to Book Growth	2.7%	10.5%	1.0%	5.3%	-2.0%	19.6%
	Real Book Value Growth	1.2%	-2.6%	3.2%	-1.2%	3.7%	5.9%
	Dividend Income	4.3%	5.2%	4.4%	4.0%	4.1%	0.6%
	Residual Interactions	0.7%	1.6%	0.9%	0.3%	0.2%	0.8%
MSCI UK	Gross Index Return (GBP)	**15.4%**	**34.6%**	**23.2%**	**14.2%**	**0.8%**	**19.9%**
	Inflation (GBP)	5.4%	15.4%	6.5%	3.1%	1.9%	2.3%
	Price to Book Growth	4.2%	14.6%	8.2%	7.7%	-7.5%	20.4%
	Real Book Value Growth	0.8%	-3.9%	2.1%	-0.4%	3.4%	7.3%
	Dividend Income	4.1%	5.8%	4.8%	3.3%	3.5%	0.5%
	Residual Interactions	0.8%	2.6%	1.7%	0.5%	-0.4%	1.2%

Source: MSCI Barra, OECD (inflation). AUD inflation is based on Australian Bureau of Statistics data[2]. Data as of September 30, 2009.

We observe similar trends for the US and Europe: the first three periods saw high total returns whereas the last decade had a decline. Valuation ratios showed considerable growth in the 1980s and 1990s for both regions, and inflation was lower in Europe than in the US.

These dynamics were significantly different in Japan. First, during this 35-year period, the annualized performance of the MSCI Japan Index was approximately half that of the other two regions, even after accounting for inflation. Notably, the last two decades in Japan were marked by a continued underperformance, mainly due to the shrinking valuation ratios after the burst of the Japanese bubble. Second, dividend income was less than half of that in the other regions and was not the most important component of the total return after inflation.

Australia and the UK generally outperformed the other regions during the 1975-2009 period in local currency terms. This outperformance is mainly due to their higher inflation rates and dividend yield. The first five-year subperiod (1975-1979) saw exceptional gross returns in both countries (25.8% for the MSCI Australia Index and 34.8% for the MSCI UK Index) due to annual inflation and PB growth rates above 10%. It is also interesting to note that Australia had a positive

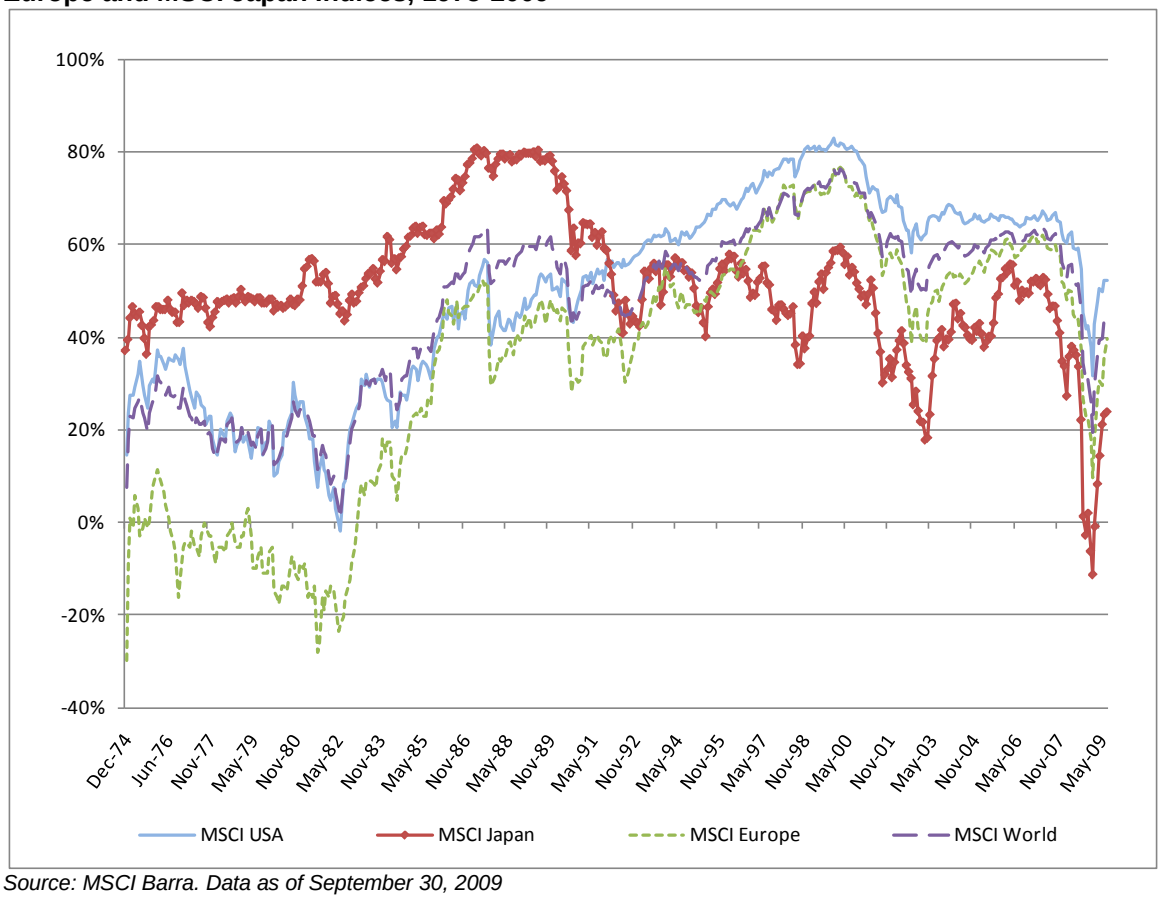
[2] ABS publishes quarterly CPI data. We used linear interpolation to generate monthly series. Note that this process also lowers the volatility of the inflation component.

annualized gross performance of 9.1% in the last decade, due to a relatively high dividend income and a relatively small decline in the PB ratio.

Decomposing price into book value and expectations of excess returns

Next, we take a closer look at the evolution of the price component of the regional indices. To do this, we decompose the price index level. We look at the book value per share, which we assume to be the liquidation value of the companies represented by the index. We also look at the difference between the price and the book value per share, which we attribute to expectations of future excess returns (returns above the return on equity— see Ohlson 1995 for the derivation of this result)[3]. Mathematically, the fraction of the book value component in the price is simply 1/PB, whereas the remaining fraction, 1-1/PB, represents the expectations of excess returns. Exhibit 4 shows the evolution of the latter for the MSCI World, MSCI USA, MSCI Europe and MSCI Japan price indices.

Exhibit 4: Fraction of expectations of excess returns in the MSCI World, MSCI USA, MSCI Europe and MSCI Japan Indices, 1975-2009



Source: MSCI Barra. Data as of September 30, 2009

We observe similar trends throughout the history for the MSCI World, MSCI USA, and to a lesser extent MSCI Europe Indices. From the mid 1970s, expectations of excess returns have been on an increasing trend. They stabilized in the 1980s at around 40-50%. Extreme events (for example, the dot-com bubble and the latest financial crisis) caused expectations of excess

[3] Note that one limitation of this analysis is its reliance on an accounting (as opposed to economic) measure to derive expectations of excess returns.

returns to drop to very low, even negative values, but these recovered to the pre-crisis levels relatively quickly.

These dynamics are again different in Japan. In Japan, expectations of excess returns started off at a higher level in the mid 1970s and reached a peak earlier than the other regions, at the top of the asset bubble of the 1980s. Afterwards, expectations were on a downward trend, and generally stayed below the levels of the other regions. After the dot-com bubble, Japan started to move in parallel with the other regions.

We can infer from this graph that over time, differences in expectations of excess returns have shrunk significantly among the different regions.

Conclusions

We decomposed long run returns of major equity markets into several components. The analysis showed that after inflation, dividend income was the most important part of equity returns for the majority of markets. Growth in real book value had a low, but steady contribution to performance. Changes in valuation tended to smooth out in the long run, but had important implications to equity investing in the short run.

We also analyzed how expectations of future excess returns – directly related to the price to book ratio - have evolved over time for different regions. After the continuing expansion in the 1980s and 1990s, these expectations have stabilized at historically high levels, quickly recovering from their lows in the 2009 due to the financial crisis. At the same time, differences in expectations of excess returns have shrunk significantly among the different regions.

References

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