

Size matters when investing in global equities

When investing globally a number of factors are at play. **PHILLIP DOLAN** and **SERENA YU** explain the impact of country and global sector factors on large and small international equities.

A number of recent studies have examined the extent to which global sector factors are becoming of greater importance, relative to country-level factors, in determining the relative returns of equities¹.

One rationale for this work has been the desire to determine to what extent, if any, globalisation has led to an increase in the influence on stock returns of global sector factors, at the expense of country-level market returns.

This paper examines this question, but draws a distinction between large and small capitalisation stocks. This distinction is important because, if it is the case that the growing influence of sectors has been limited to larger firms, there will be implications for investment management and portfolio design within the small capitalisation sector.

In particular, while the increased influence of global sector factors on large capitalisation stocks may imply that a global approach to stock selection is now to be preferred for these bigger stocks, a country level approach may still be preferred for small capitalisation portfolio construction, if country—or regional-level factors—are still by far the dominant influences on such stocks.

We found that while global sector factors are becoming increasingly important for both large and small capitalisation stocks in developed markets, with the average correlation of stocks with global sector factors increasing from 0.55 to 0.64 for large cap stocks, and from 0.48 to 0.54 for small cap stocks over the last eight years, this trend has

been less pronounced for small capitalisation stocks.

Across a range of sectors and countries, we find that the returns to small cap stocks are still primarily driven by country-level factors. On average, the impact of country-level factors (measured in terms of relative correlations) on small stock returns is about 10% higher than the impact of global sector-level factors.

This compares with the situation for large cap stocks, where sector-level factors have, on average, a 14% higher impact on stock returns, and where the impact of global sector factors relative to country factors continue to increase steadily.

This suggests that successful small cap managers are more likely to be those that take account of country—or regional-level factors—in selecting stocks, and that a strong knowledge of local factors will be important in seeking to add value; whereas for large cap managers, a sector-level focus is an increasingly important issue, possibly in addition to a country-level view.

The data used consisted of sector and country returns in \$US, for large and small cap firms, over the period 1990 to 2001. These were sourced from Salomon Smith Barney's (SSB's) Broad Market Index (BMI), Primary Market Index (PMI) and Extended Market Index (EMI) series, representing All Cap (ie, large and small) stocks, large cap stocks only and small cap stocks only, respectively². The countries used are shown in Table 1.1. The sectors are as shown in Table 1.2.

Earlier studies

A number of other studies have

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TABLE 1.1 COUNTRIES IN SSB INDICES

Australia
Canada
France
Germany
Hong Kong
Italy
Japan
United Kingdom
United States

TABLE 1.2 SECTORS IN SSB INDICES

Basic materials
Consumer cyclicals
Industrial goods and services
Technology
Transport
Consumer non-cyclicals
Energy
Healthcare
Telecommunications
Utilities

examined the question of the extent to which global factors are becoming more influential in determining asset prices. This growing influence is perceived to be coming at the expense of local factors. The global and local factors in question have been examined at either (i) the market wide level (see, for example, Diermeier and Solnick (2001)), or (ii) at the sector/industry

group level (see, for example, Barnes, Bercel and Rothmann (2001)).

These studies find that the impact of global factors has increased relative to local factors in recent years. This is attributed to the growing spread of “globalisation”, broadly defined. The increase in cross-border investment and M&A activity, increasing global trade, growing synchronisation of world economic cycles, deregulation of financial markets, and the rise of the multinational corporation are all seen as contributing factors to this trend. To date, most of these studies have not drawn a distinction between large and small firms³.

To the extent that globalisation has been a driving force in the results referred to above, it raises the question as to which kind(s) of stocks are most likely to have been affected in this way. Intuition, and prior research, suggests that those firms that are most active globally are most likely to fall into this category.

For example, Diermeier and Solnick (2001) note: “A large number of companies are still primarily domestic in their activities, but as their international involvement expands, country factors should become increasingly correlated and their importance should diminish relative to ‘real’ factors, such as industry factors” (pg 44). To the extent that firm size is positively correlated with degree of “international involvement”,

one would thus expect to see that the effect documented above is more pronounced for larger companies than for smaller ones.

Thus, for example, a large cap global equity manager analysing (say) General Motors must increasingly be aware of that firm’s attractiveness relative to (say) Toyota, and the influence of the global macroeconomic and auto cycles on its business. The fact that GM is notionally a US firm and Toyota a Japanese one increasingly matters less than the fact that both are auto manufacturers. On the other hand, small cap managers, analysing firms that primarily compete domestically, need to be more aware of the local factors that determine relative firm performance.

Our results

In an extension of the above studies, we seek to establish the relative importance of country and global sector factors for large cap and small cap stocks separately. To accomplish this objective, 3 year rolling correlation series were calculated for each country and each sector, separately for large and small cap stocks.

For example, we measured the correlation between Australian small cap industrial goods and services stocks versus the Australian country benchmark index (country BMI), as well as against a global sector benchmark index (global sector BMI). We then compared this correlation with the equivalent measure for large cap stocks (ie, the correlations of large cap Australian industrial goods and services stocks with the local country index and with the global sector index).

As well, we looked at changes in these various correlations over time to see if the previously identified trend towards greater sector influences was primarily affecting large cap stocks, as opposed to small cap ones. Figure 3.1 illustrates the results for the Australian Industrial Goods and Services sector.

The figure 3.1 shows that for small caps in this particular sector and country, country level factors are clearly the stronger driver of stock returns, relative to the sector effect. The same is true here for large cap companies, however for these stocks, sector factors

FIGURE 3.1 AUSTRALIAN INDUSTRIAL GOODS AND SERVICES

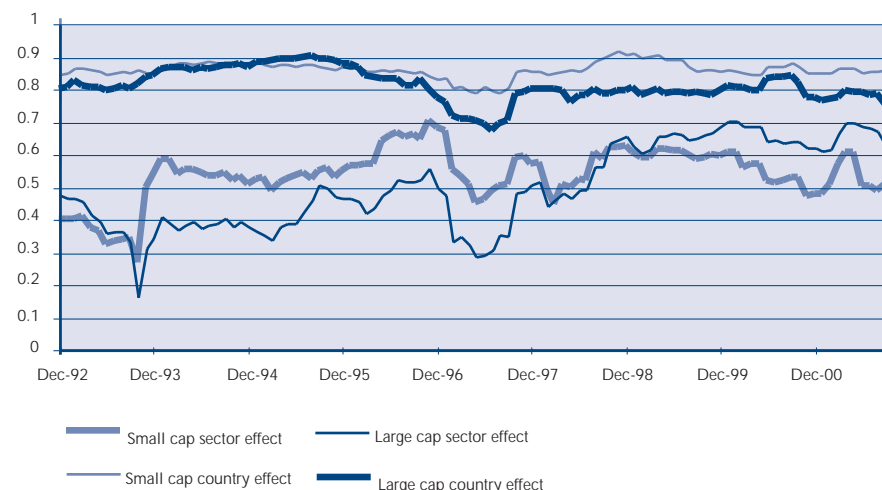


FIGURE 3.2 COUNTRY FACTOR CORRELATIONS TO SEPTEMBER 2001, BY SECTOR

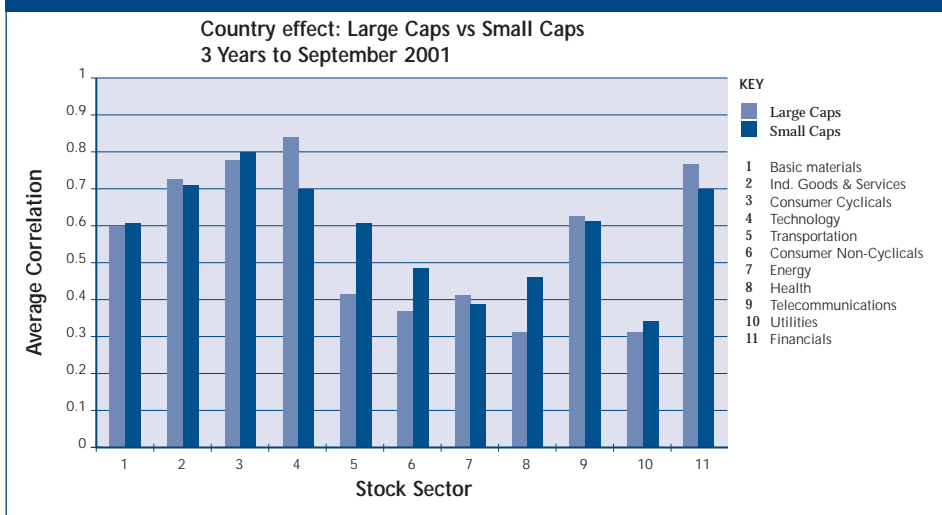


FIGURE 3.3 COUNTRY FACTOR CORRELATIONS TO SEPTEMBER 1993, BY SECTOR

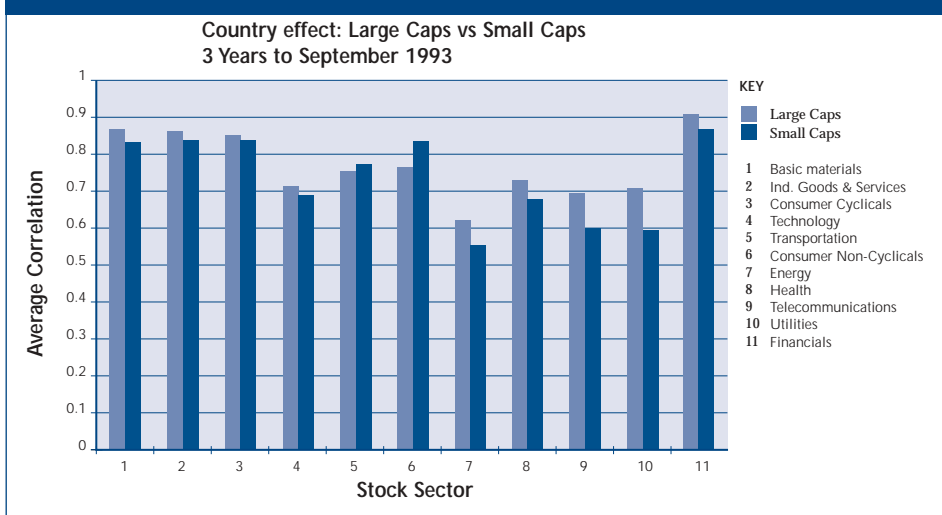
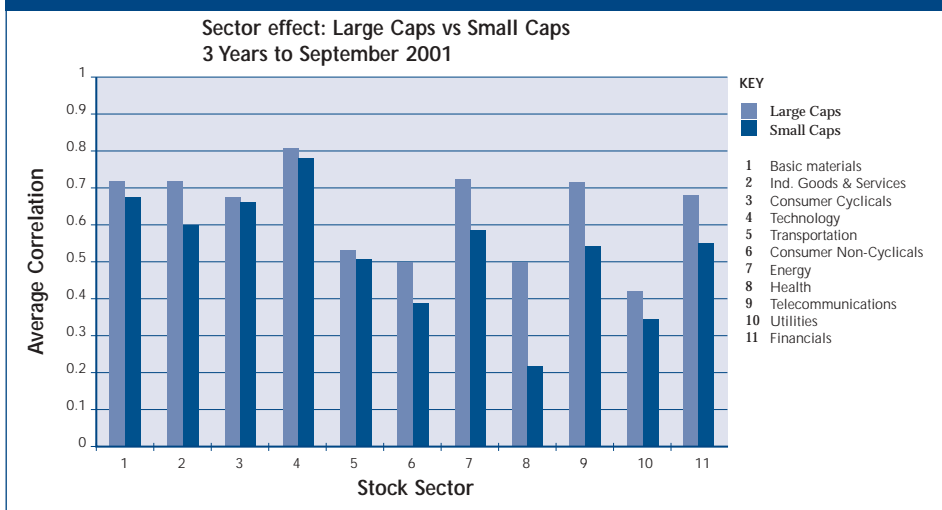


FIGURE 3.4 SECTOR CORRELATIONS TO SEPTEMBER 2001, BY SECTOR



have been rising in importance and are approaching the same level of importance as country factors.

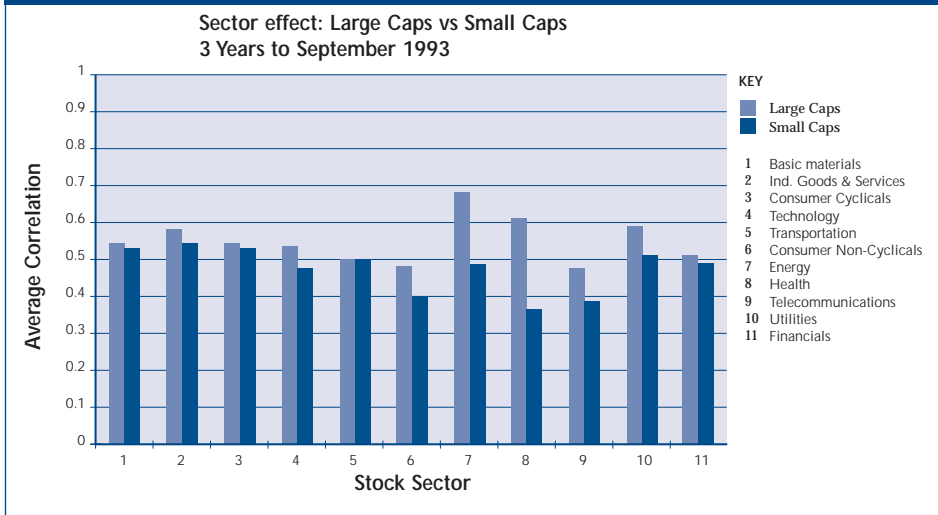
In order to provide general results for the influence of country and sector effects across a range of sectors and markets, the correlation coefficients were averaged at different points in time. These snapshots provide a measure of how correlations between stock returns and their country and sector factors have changed over time. The results have been classified by both sector and country in order to isolate any phenomena particular to any sector or country. Further results are shown in tables in the Appendix.

Figures 3.2 and 3.3 show correlations between stock returns and country return benchmarks for the three years to September 2001 and the corresponding period eight years ago. We can see that across almost all sectors, for both large and small cap stocks, country factors have fallen in significance since 1993. While country factors were formerly a strong driver for large cap stock returns, this prominence has been substantially diminished over time. On the other hand, the decline in the importance of country factors has been less pronounced for small cap stocks, with a number of sectors now exhibiting a greater weight on local factors for small caps relative to large caps. These sectors included transportation, health and consumer non-cyclical stocks.

By contrast, global sector factors for most stocks, across all sectors, have risen in importance. This can be seen from Figures 3.4 and 3.5. Moreover, the increase has been much greater for large cap stocks, with a noticeable difference between sector factor impact for large versus small cap stocks. Sector factors were most significant for large caps in the technology, telecommunications and energy sectors, ie, those in which globalisation has been most pronounced.

The interaction between these two drivers of asset returns consolidates the above results. In general, we have seen that global sector factors have risen in importance at the expense of country factors. This is true for both small cap and large cap stocks. However, by

FIGURE 3.5 SECTOR CORRELATIONS TO SEPTEMBER 1993, BY SECTOR



comparing Figures 3.2 and 3.4, we can see that country factors generally remain at least as important as global sector considerations for small cap stocks. Contrarily, the opposite is true for large cap stocks—the prominence of global sector issues is clear, particularly for the energy, health, and transportation sectors.

We can assess the same information in a different light by categorising by country. Figures 3.6 to 3.9 exhibit this information. In Figures 3.6 and 3.7, we consider the country factors. Again, the country effects have diminished over time. As in Figures 3.2 and 3.3, the decline is less marked for small cap stocks. The countries with the strongest country factor effects are those with smaller, less diversified markets, such as Australia, Hong Kong, Italy and Japan (which has historically exhibited unique behaviour), with larger, more open, markets generating more modest country factor correlations.

The rising prominence of sector factors, as previously illustrated, is also clear from Figures 3.8 and 3.9. However, we gain additional insight from the classification by country—the most significant sector factors were generated in the larger markets, such as the US and the UK—economies which, by their sheer size and presence of multinational companies, contribute substantially to global sector movements.

The implications for portfolio management are clear. Previous studies, and the above results, imply that the risk reduction benefits associated with diversification are enhanced through diversification across sectors as well as countries.

However, the relative importance of these factors depends on the capitalisation profile of companies in the portfolio. For small cap managers, although sector factors have risen in influence, local factors remain the major drivers for stock returns for most sectors. This is illustrated in Figure 3.10. For large cap managers, the traditional focus on local issues is becoming less important as sector considerations gain momentum.

Nevertheless, while substantial political, legislative, cultural and business practice differences persist

FIGURE 3.6 COUNTRY CORRELATIONS TO SEPTEMBER 2001, BY COUNTRY

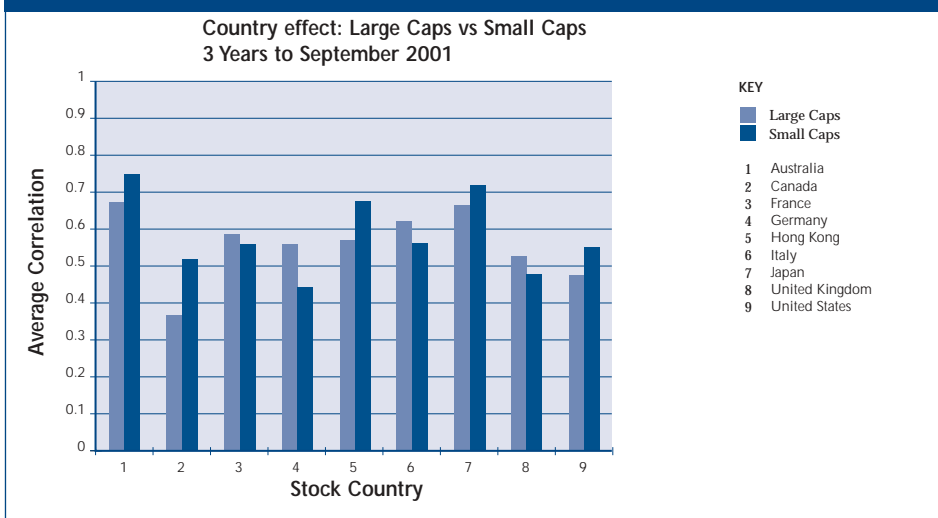


FIGURE 3.7 COUNTRY CORRELATIONS TO SEPTEMBER 1993, BY COUNTRY

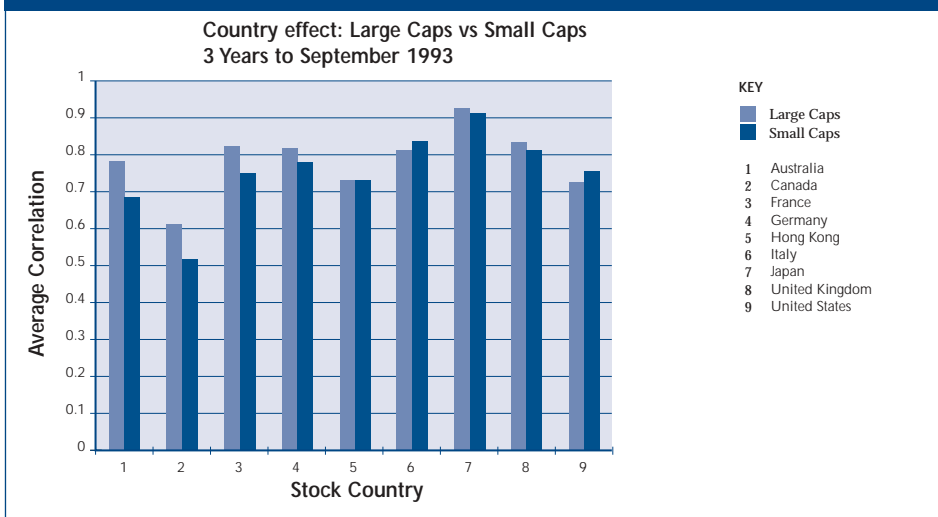
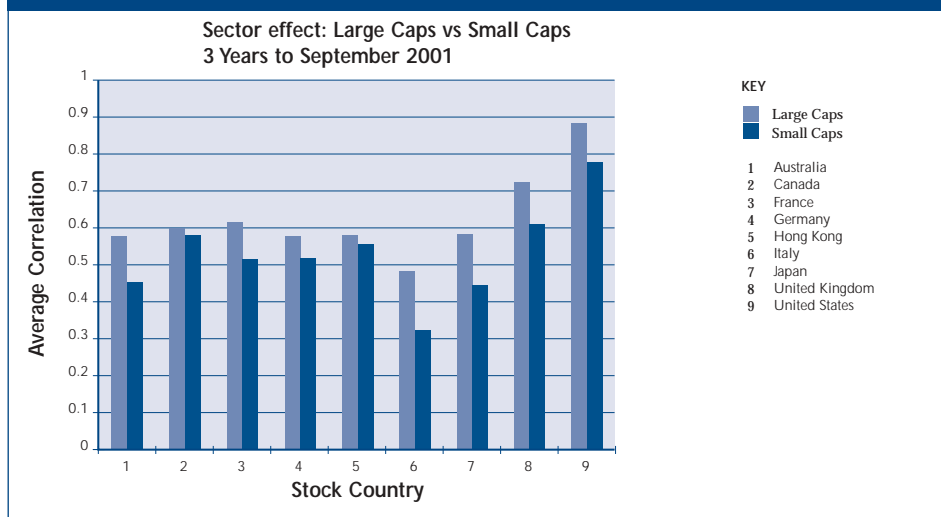


FIGURE 3.8 SECTOR CORRELATIONS TO SEPTEMBER 2001, BY COUNTRY



between countries, local factors will still contribute significantly to stock returns. This contribution is still the major influence on small cap stock returns. This suggests that small cap managers need a strong regional focus to their activities, and that any global small cap fund should specifically consider the regional implications inherent in investing in such stocks.

Conclusion

Like predecessor studies, we have shown that, when predicting stock price movements, sector level factors are gaining momentum at the expense of country level factors. Further to this, we have distinguished the relative importance of sector and country level factors for large and small cap stocks.

For large cap stocks, sector level factors are increasingly significant in determining stock returns, generally dominating the weight of country level factors. We predict that country level effects will continue to diminish as globalisation continues to manifest itself in the form of growing multinational companies and more integrated world financial markets.

The large cap sectors which saw the highest correlation with sector returns included the technology, telecommunications and energy sectors, sectors which have experienced globalisation most strongly. The countries in which large caps had the greatest correlation with sector returns included the US and the UK.

For small cap stocks, we have seen that sector level factors are also becoming a stronger driver of stock returns. Unlike large cap stocks, however, country level factors persist in generally having the strongest impact on stock returns.

The countries which experienced the highest correlation with country index returns included Hong Kong, Italy and Australia—economies which, because of their size, are less diversified and are described by more country-specific factors.

Accordingly, we recommend that for global large cap managers, global sector considerations should at least be on an equal footing to country level issues when designing and managing a portfolio. Contrarily, global small cap

FIGURE 3.9 SECTOR CORRELATIONS TO SEPTEMBER 1993, BY COUNTRY

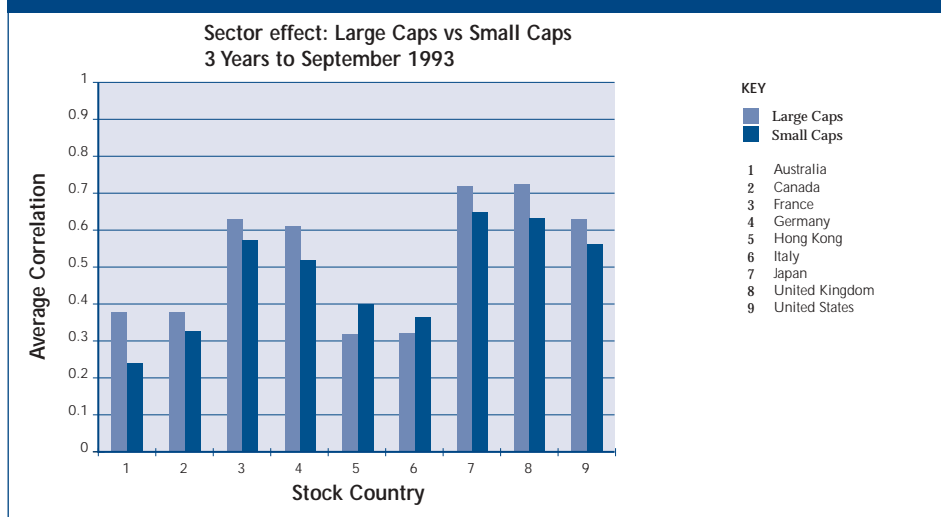


FIGURE 3.10 COUNTRY VS SECTOR FACTORS FOR SMALL CAP STOCKS, TO SEPTEMBER 2001

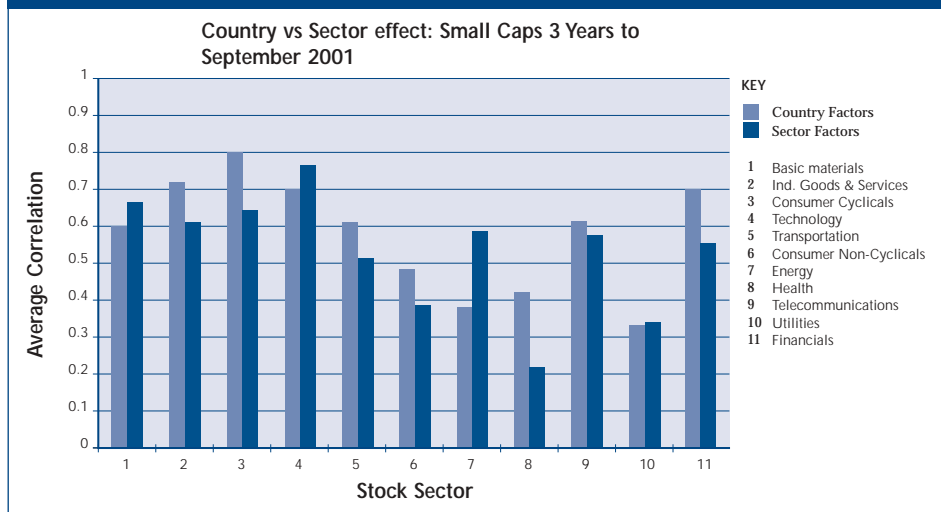


TABLE 1 SMALL CAPS 3 YEAR CORRELATION WITH COUNTRY BENCHMARK, TO SEPTEMBER 2001

Country	Sector											
	1	2	3	4	5	6	7	8	9	10	11	12
Australia	0.7987	0.8621	0.8574		0.5292	0.7896	0.6570	0.6434		0.7435	0.8887	0.7522
Canada	0.3014	0.7369	0.7000	0.7444	0.5114	0.1578	0.3642	0.5893	0.6925	0.1562	0.6170	0.5065
France	0.5801	0.8436	0.8289	0.7343	0.6242	0.3106	0.3663	0.4409		0.2563	0.5977	0.5583
Germany	0.5696	0.6480	0.7450	0.6584		0.2371	0.0811	0.2504		0.1327	0.5514	0.4304
Hong Kong	0.6245	0.5527	0.8323	0.6589	0.7380	0.6613	0.4305		0.7431	0.6046	0.8338	0.6680
Italy	0.6134	0.5895	0.8800	0.7156		0.8193	0.2242	0.1523	0.2871	0.5396	0.8919	0.5713
Japan	0.7282	0.8259	0.8802	0.7612	0.6028	0.7723	0.4932	0.7566	0.7155	0.5923	0.7678	0.7178
UK	0.6933	0.7667	0.6831	0.5316	0.5490	0.0912	0.4326	0.3503	0.4750	-0.0830	0.7159	0.4733
US	0.5253	0.7689	0.7920	0.7893	0.6759	0.4294	0.4583	0.4430	0.7960	0.1621	0.4194	0.5691
Average	0.6038	0.7327	0.7999	0.6992	0.6044	0.4743	0.3897	0.4533	0.6182	0.3449	0.6982	

KEY

1 Basic Materials 2 Industrial Goods & Services 3 Consumer Cyclical 4 Technology 5 Transportation 6 Consumer Non-Cyclical 7 Energy 8 Healthcare 9 Telecommunications 10 Utilities 11 Financials 12 Average

TABLE 2 LARGE CAPS 3 YEAR CORRELATION WITH COUNTRY BENCHMARK, TO SEPTEMBER 2001

Country	Sector											
	1	2	3	4	5	6	7	8	9	10	11	12
Australia	0.8296	0.7538	0.6784		0.5751	0.6576	0.6314		0.5519	0.4451	0.8704	0.6659
Canada	0.4067	0.6788	0.6000	0.8223	0.2141	-0.2119	0.2783	0.3892	0.5657	-0.1789	0.4986	0.3694
France	0.4363	0.7253	0.8708	0.8547		0.7634	0.2507	0.2900	0.6041	0.3781	0.7761	0.5949
Germany	0.7381		0.7635	0.8681	0.3610			0.3052	0.4227	0.2979	0.8521	0.5761
Hong Kong	0.3727				0.4350				0.6792	0.4826	0.9013	0.5742
Italy			0.8554				0.2587		0.7733	0.4696	0.8016	0.6317
Japan	0.7523	0.9175	0.8051	0.8015	0.5798	0.6389	0.5306	0.5301	0.7214	0.4170	0.7931	0.6807
UK	0.7756	0.7977	0.7468		0.4755	0.1941	0.5775	0.1882	0.6068	0.2698	0.8336	0.5466
US	0.4518	0.5920	0.8097	0.8756	0.2988	0.1261	0.4327	0.2149	0.6455	0.2014	0.5979	0.4769
Average	0.5954	0.7442	0.7662	0.8444	0.4199	0.3614	0.4228	0.3196	0.6190	0.3092	0.7694	

KEY

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managers should pursue sources of value-add at a regional level, with some consideration given to sector level exposure. In constructing a global small cap portfolio, doing so along regional lines is more likely to allow managers to focus on those factors that most influence relative returns, and so is more likely to produce added value.

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Hopkins, P., and C. Miller, Country, sector and company factors in global equity portfolios, AIMR Research Foundation, August 2001.

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NOTES

1 See, for example, Barnes, et al (2001), Hopkins et. al. (2001) or Williams et. al.

(2001). As well, Diermeier and Solnick (2001) examine the extent to which global market, as opposed to sector, factors are increasing in importance relative to country-level effects.

2 The BMI consists of stocks with a market capitalisation of greater than or equal to US\$100 million, spanning 22 countries. The BMI consists of over 95% of total worldwide market value. The PMI is defined by the top 80% of stocks in the BMI, ranked by available capital within each country, with the remaining 20%

TABLE 3 SMALL CAPS 3 YEAR CORRELATION WITH SECTOR BENCHMARK, TO SEPTEMBER 2001

Country	Sector											
	1	2	3	4	5	6	7	8	9	10	11	12
Australia	0.6655	0.5080	0.6322		0.3287	0.4040	0.5168	0.4144		0.1879	0.3988	0.4507
Canada	0.5882	0.6484	0.6708	0.8735	0.1009	0.5369	0.8118	0.1821	0.7323	0.5377	0.7034	0.5805
France	0.8132	0.5763	0.7609	0.7525	0.5124	0.3864	0.5771	0.0594		0.2712	0.5266	0.5236
Germany	0.6807	0.6459	0.5426	0.7016		0.2189	0.4256	0.5369		0.3210	0.5750	0.5165
Hong Kong	0.5781	0.4784	0.6147	0.6592	0.6425	0.3770	0.4005		0.5859	0.3712	0.6472	0.5355
Italy	0.4677	0.4260	0.5340	0.7128		0.0875	0.6790	-0.1850	0.3022	0.0358	0.2332	0.3293
Japan	0.4430	0.5751	0.5048	0.7170	0.6708	0.4582	0.3785	0.3298	0.1000	0.2980	0.5024	0.4525
UK	0.8784	0.7587	0.6807	0.7729	0.6995	0.4750	0.6308	0.1951	0.7754	0.2685	0.6296	0.6150
US	0.8892	0.8907	0.8777	0.9451	0.7249	0.5721	0.8416	0.3103	0.8768	0.9084	0.6967	0.7758
Average	0.6671	0.6119	0.6465	0.7668	0.5257	0.3907	0.5846	0.2304	0.5621	0.3555	0.5459	

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 1 Basic Materials 2 Industrial Goods & Services 3 Consumer Cyclical 4 Technology 5 Transportation 6 Consumer Non-Cyclical 7 Energy
 8 Healthcare 9 Telecommunications 10 Utilities 11 Financials 12 Average

TABLE 4 LARGE CAPS 3 YEAR CORRELATION WITH SECTOR BENCHMARK, TO SEPTEMBER 2001

Country	Sector											
	1	2	3	4	5	6	7	8	9	10	11	12
Australia	0.8463	0.6265	0.5880		0.4588	0.4613	0.6358		0.6591	0.4362	0.5200	0.5813
Canada	0.7289	0.6318	0.4363	0.8358	0.6524	0.1242	0.8479	0.3126	0.6814	0.5587	0.7768	0.5988
France	0.6747	0.6773	0.6696	0.5617		0.5992	0.7690	0.3725	0.7384	0.3929	0.5750	0.6030
Germany	0.7491		0.7200	0.7136	0.3661			0.3625	0.7389	0.2814	0.5842	0.5645
Hong Kong	0.5695				0.5219				0.6332	0.4302	0.6708	0.5651
Italy			0.4735				0.5620		0.7115	0.2302	0.5077	0.4970
Japan	0.5223	0.6575	0.7834	0.7929	0.6449	0.4146	0.4692	0.4586	0.6326	0.3509	0.6460	0.5794
UK	0.8895	0.7830	0.7210		0.6215	0.6033	0.9079	0.5896	0.8498	0.5179	0.8724	0.7356
US	0.9078	0.8574	0.9309	0.9793	0.6675	0.9270	0.9233	0.9419	0.7576	0.8519	0.8857	0.8755
Average	0.7360	0.7056	0.6654	0.7767	0.5619	0.5216	0.7307	0.5063	0.7114	0.4500	0.6710	

KEY
 1 Basic Materials 2 Industrial Goods & Services 3 Consumer Cyclical 4 Technology 5 Transportation 6 Consumer Non-Cyclical 7 Energy
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from each country forming the EMI. We have selected the largest economies for analysis.

3 An exception is Barnes et. al (2001) who conclude, when comparing country and global sector effects, that "As the company size increases, the sector effect gains in importance" (pg. 47).

APPENDIX

The following country/sector pairs contained no data in the SSB indices:

<u>Australia</u>	
Large Caps	Small Caps
Technology	Technology
Healthcare	Telecommunications
<u>France</u>	
Large Caps	Small Caps
Transport	Telecommunications
<u>Germany</u>	
Large Caps	Small Caps
Consumer non-cyclicals	Transportation
Energy	Telecommunications
<u>Hong Kong</u>	
Large Caps	Small Caps
Industrial goods	Healthcare

and services	
Consumer cyclicals	
Technology	
Energy	
Healthcare	
<u>Italy</u>	
Large Caps	Small Caps
Industrial goods	Transport
and services	
Technology	
Transportation	
Healthcare	
<u>United Kingdom</u>	
Large Caps	
Technology	