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CAMBRIDGE ASSOCIATES LLC

GLOBAL MARKET COMMENT: A NOTE ON DIVERSIFICATION

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A Note on Diversification

In recent years correlations among global equities have increased, in some cases to unprecedented levels. This was exacerbated in September, as a flight to quality sent all but the safest assets and perceived safe havens south. Although most markets have rebounded somewhat from the post-September 11 lows, market shocks serve as a reminder of the benefits of diversification into asset classes with different economic bases of returns. It is especially important that during periods of volatility and uncertainty that portfolios be well-diversified across different assets with different risk exposures.[1]

Diversifying with Equities

Although correlations among global equities are currently high, diversifying geographically can still help to reduce portfolio risk. Table A shows that today's levels of global equity correlations are not unprecedented, having been reached many times over the last three decades. High correlations may be expected to persist across borders within sectors that are increasingly global such as technology, media, and telecoms; however, there is no reason to believe that changes have occurred over the last several years to promote a secular rise in global equity correlations. Therefore, investors should be cautious about assuming that the recent trend represents a permanent, secular shift, as opposed to a temporary, cyclical phenomenon.

In addition, there are some differences among regional correlations, mostly due to the influence of Japanese equities (Table A). Regions with the highest correlations include: U.S./U.K., 0.82; U.K./ Europe ex U.K., 0.77; and U.S./Europe ex U.K., 0.77. However, correlations among other regions are lower: U.S./Japan, 0.55, U.K./Japan, 0.43, and Europe ex U.K./Japan, 0.51. Investors should not assume that correlations among all global equities are equally high and that there are no opportunities for diversification among them.

Diversifying into Asset Classes with Differing Economic Bases of Returns

Many asset classes, such as nominal bonds (particularly high-quality bonds), inflation-linked bonds, and commodities have different fundamental drivers of return and can be expected to provide true diversification benefits, often times even in the midst of a crisis. While some asset classes that have distinct economic bases of returns from equities benefit during periods of rising inflation, signs of which appear to be absent in the present environment, there's certainly a reasonable possibility that central bank

[1] See our 2000 paper, *Diversification: A Warning Note.*

responses to the short-term economic shocks of the terrorist attacks will prove too aggressive, leading to some cyclical rise in inflation. Tables B through D provide correlations of equities with these asset classes.

Diversifying with Bonds

Historically, high-quality bonds have performed well during periods of economic contraction and outright deflation. For example, in the early 1930s, when severe deflation pummeled already depressed stock prices, bonds were the only asset class that offered investors shelter from the storm. Bonds have also performed well during periods of sudden and unexpected financial or economic stress as fearful investors engage in a flight to quality. For example, in September, long-term U.S. Treasury bonds returned 0.2%, while, at the other end of the risk spectrum, U.S. large-cap stocks returned -7.5%, and riskier investments in U.S. small-cap and emerging markets equities returned -13.2% and -15.5%, respectively. Similarly, during the 1998 Asian financial crisis, long-term U.S. Treasury bonds returned 8.0%, while U.S. large-cap stocks returned -19.0%.

Correlations between equities and government bonds have been consistently and significantly lower than correlations among equities only, although they also have fluctuated substantially over the past 14 years (Table B). Since 1986, correlations of MSCI U.S. and the J.P. Morgan U.S. Government Bond Index have dropped dramatically from 0.62 to their present level of -0.18; U.K. equities/U.K. bonds, from 0.73 to 0.08; Europe ex U.K. equities/German bunds, from 0.62 to -0.18; and Japan equities/ Japanese bonds, 0.69 to 0.06.

Diversifying with Inflation-Linked Bonds

Another way to diversify portfolio risk is through inflation-linked bonds (Table C). When inflation is unexpectedly high, we would expect inflation-linked bonds to perform well and conventional bonds to perform poorly, while the reverse would be true during periods of disinflation or deflation. [2] For example in the United States during the period of 1997-98, Treasury Inflation-Protected Securities (TIPS) performed poorly relative to conventional Treasury bonds because inflation was very low, real yields rose, and nominal yields fell. The total return for TIPS over the two-year period was 7.9%, compared to nearly 25% for conventional ten-year Treasuries. However, in 1999, the market environment became more favorable for TIPS than for conventional Treasuries, as economies around the globe sought to reflate after the collapse of emerging markets in the fall of 1998, with ten-year TIPS returning 4.2%, while

[2] However, U.S. TIPS include a principal guarantee that would preserve the value of TIPS during a period of disinflation or deflation, provided that real yields do not rise. See our January 2001 report, *U.S. Treasury Inflation-Protected Securities: Fixed Income Substitute?*

conventional ten-year Treasuries returned -3.4%. In contrast to 1997-98, nominal yields rose faster than real yields and inflation climbed above 2.5%. In September 2001, inflation expectations decreased, as measured by the spread between yields of TIPS and nominal bonds of comparable maturity, while nominal yields fell faster than real yields, resulting in the Lehman Brothers U.S. TIPS Index returning 0.6% and the Lehman Brothers Government Bond Index returning 1.7%.

Correlations between inflation-linked bonds and equities can also be expected to be low on average, but with significant variation over time. The history of inflation-linked bond returns is generally short, so Table C is based on actual returns after the issuance of these bonds in various countries, and simulated returns for earlier years. Correlations between U.S. equities and TIPS are currently -0.03, nearly midway between their historical range of between 0.58 and -0.42; U.K. equities/U.K. inflation-linked bonds correlations are currently 0.26, and they have ranged between 0.67 and -0.18; while those of French equities/French inflation-linked bonds are currently 0.02, with a 0.60 to -0.37 range.

Diversifying with Commodities

Commodity-based investments, such as oil and gas partnerships, can also help to diversify portfolios. Commodity prices are most likely to rise when an economy is running close to capacity, fueling inflationary pressures to the detriment of financial assets. Since corporate profits are pushed down by higher commodity prices and pushed up by lower commodity prices, one would expect commodity prices to move more or less in the opposite direction to the price of industrial and transportation stocks, as indeed is the case. Following September 11, commodities and equities both sold off, which implies that their correlations rise during times of crises. However, the correlation between commodities and financial assets during periods of stress is dependent upon the source of the stress. In the current market environment, with falling capacity utilization and slowing global demand, commodity prices should be expected to fall along with stocks. However, when unexpected inflation precipitates the market downturn, correlations of commodities with stocks and bonds are likely to turn negative.

Table D illustrates the diversification benefits of commodity-based assets, using the GSCI (a diversified basket of long-only, fully collateralized commodity futures) to represent commodity performance. GSCI/MSCI U.K. correlations currently stand at 0.06, modestly above their post-1972 mean of 0.02, while the present level of GSCI/Europe ex U.K. correlations is 0.17, compared with their long-term average of 0.06. GSCI/U.S. correlations are currently 0.07, having risen as high as 0.46 and fallen as low as -0.51 over the past 19 years, and GSCI/Japan currently 0.35, with its historical correlations ranging from 0.64 to -0.51.

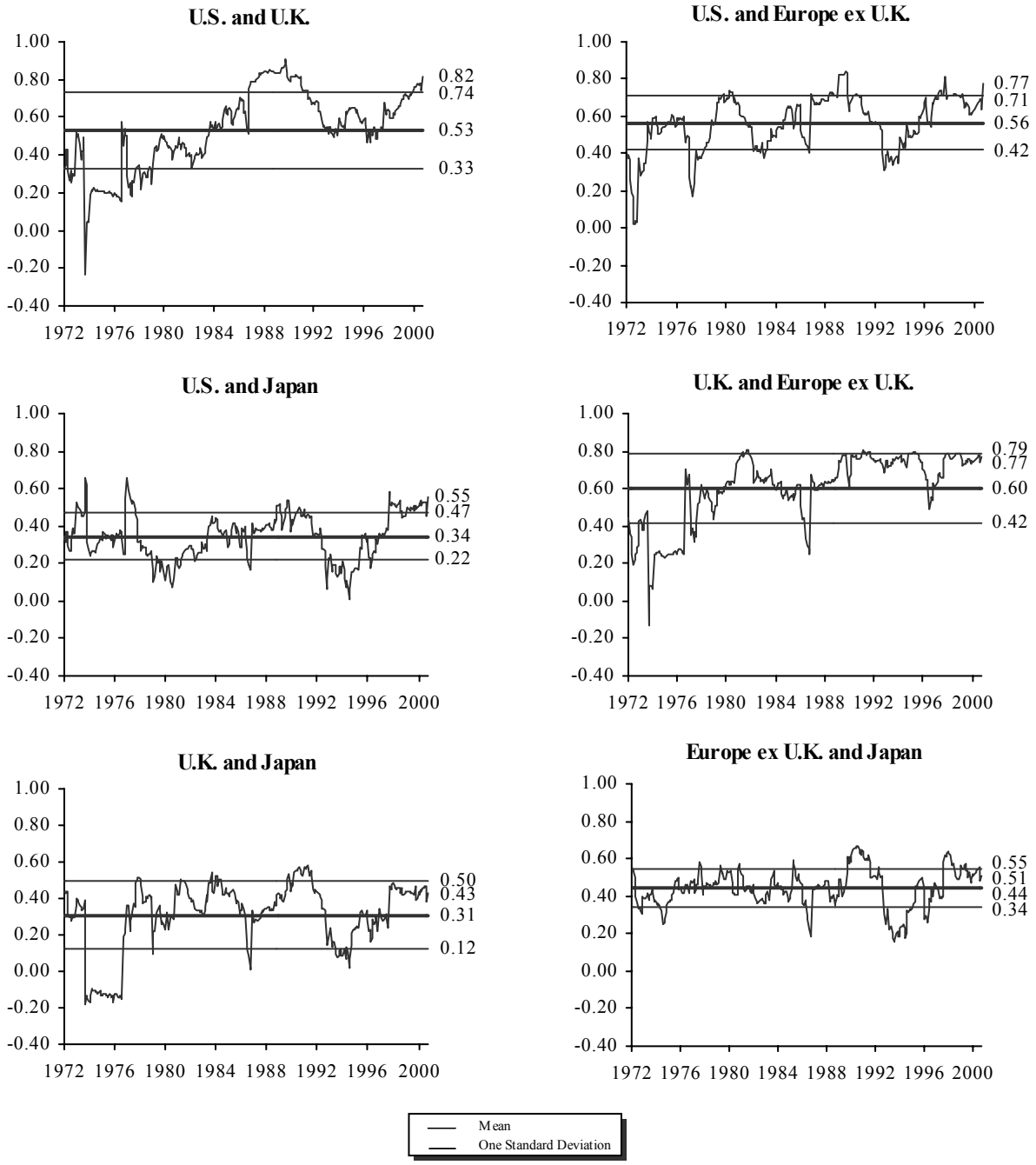
Conclusion

In a risky environment, the importance of spreading investment bets is of the utmost importance. When risks rise, correlations among asset classes that are driven by similar forces tend to rise, minimizing the diversification benefits of investing in various types of equities. However, while correlations among global equities are currently high, they still offer diversification benefits, because any measurement less than 1.0 provides some degree of diversification. Furthermore, there is no reason to expect that today's high levels will persist indefinitely. The highest degree of portfolio diversification can be gained by portfolio allocations to asset classes with different sources of returns. Of course, the benefits of diversification cannot be fully realized without disciplined rebalancing.

Table A

36-MONTH ROLLING CORRELATIONS AMONG VARIOUS MSCI REGIONS IN LOCAL CURRENCY

January 1, 1970 - September 30, 2001

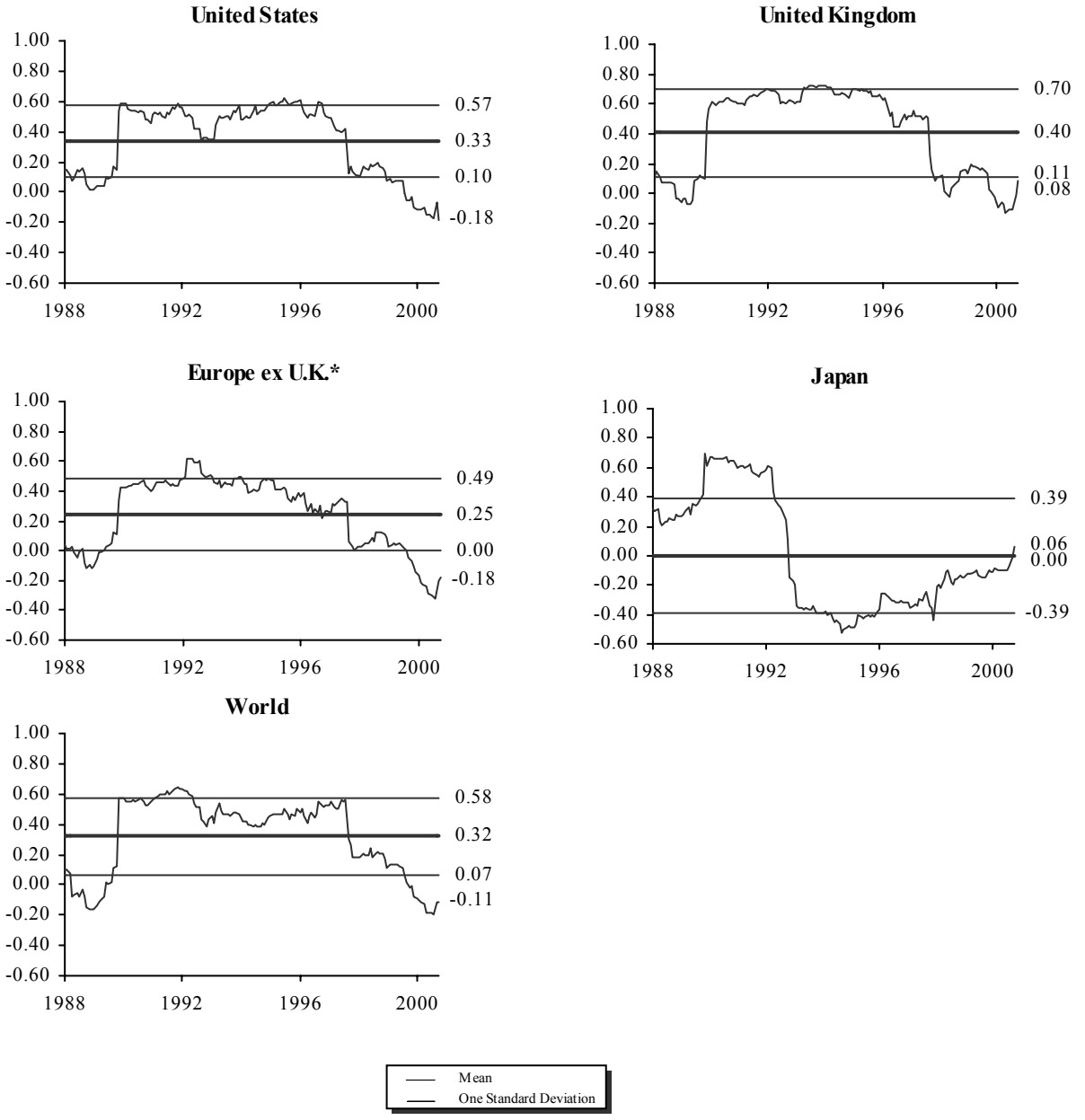


Source: Datastream International. MSCI data are copyrighted by and proprietary to Morgan Stanley Capital International, Inc.

Table B

36-MONTH ROLLING CORRELATIONS AMONG VARIOUS MSCI REGIONS AND J.P. MORGAN GOVERNMENT BOND REGIONS IN LOCAL CURRENCY

January 1, 1986 - September 30, 2001



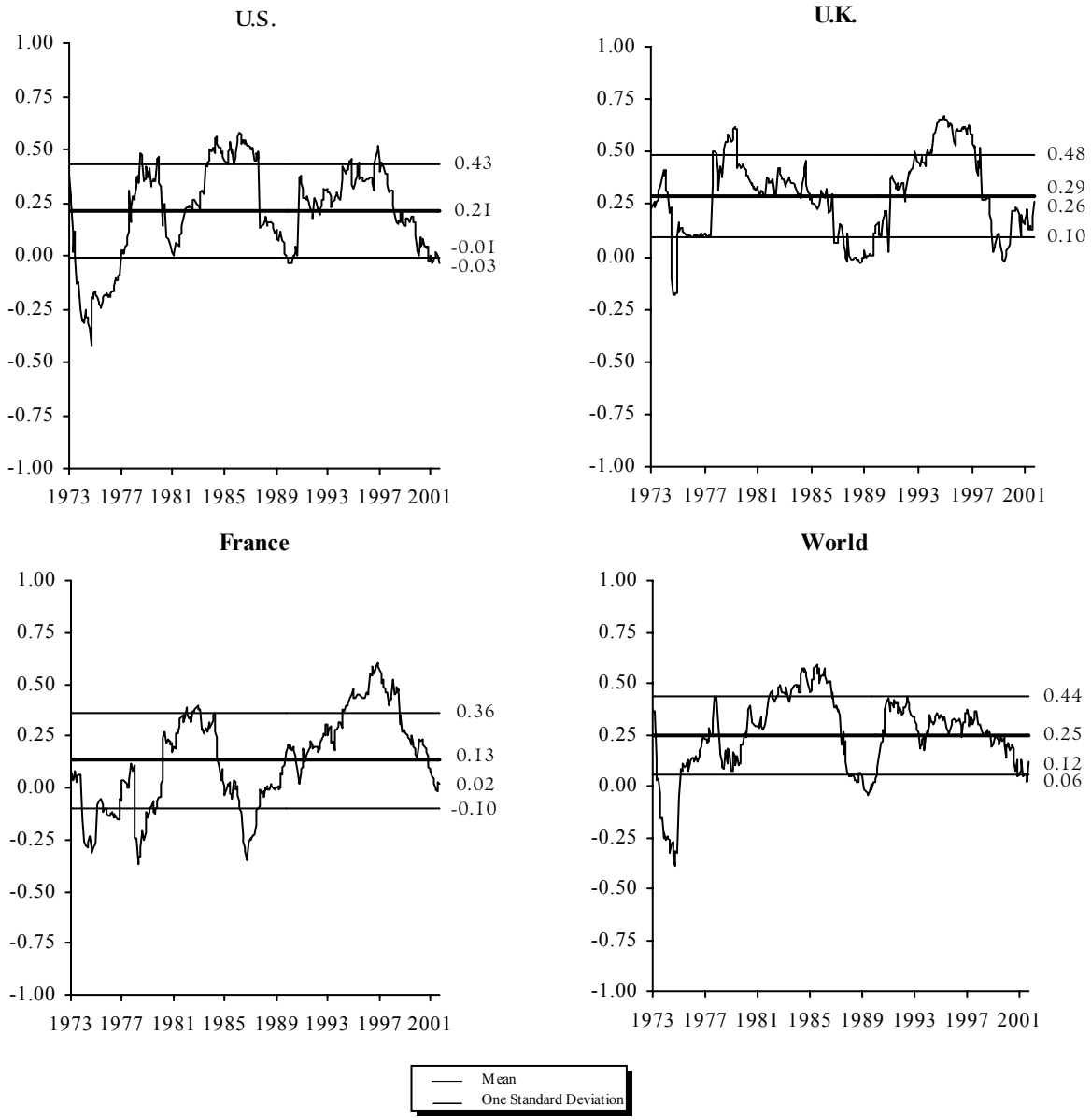
Sources: Datastream International and J.P. Morgan Securities, Inc. MSCI data are copyrighted by and proprietary to Morgan Stanley Capital International, Inc.

* German bonds are used as a proxy for Europe ex U.K. bonds.

Table C

36-MONTH ROLLING CORRELATIONS AMONG VARIOUS MSCI REGIONS AND INFLATION-LINKED BONDS IN LOCAL CURRENCY

February 1, 1970 - September 30, 2001



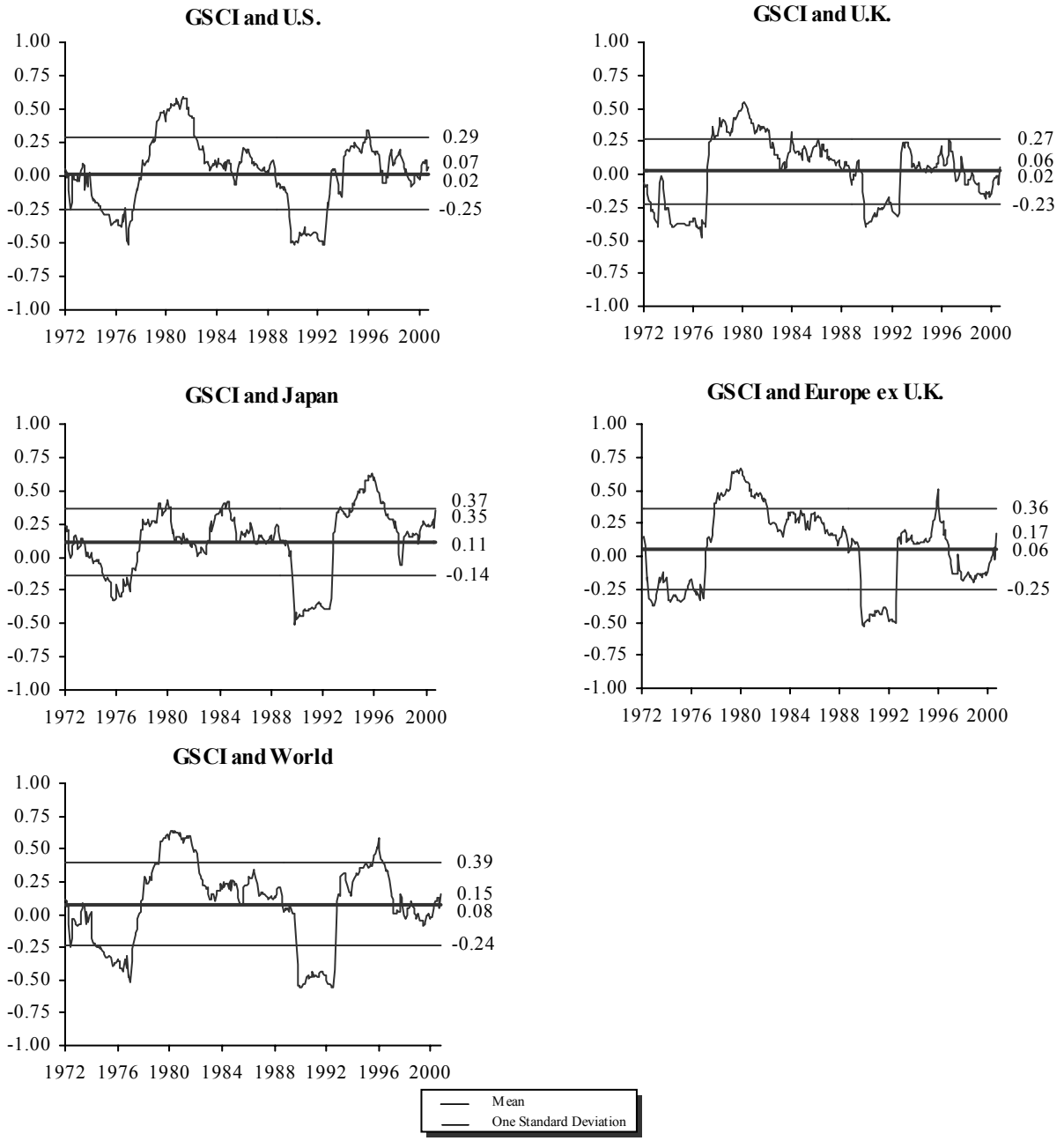
Sources: Bridgewater Associates and Datastream International. MSCI data are copyrighted by and proprietary to Morgan Stanley Capital International, Inc.

Notes: World inflation-linked equities are in US$, and world-inflation linked bonds are hedged in US$. Prior to 1997, inflation-linked bonds data are estimated for all regions by Bridgewater Associates. September 2001 inflation-linked bond returns are estimated by Bridgewater Associates.

Table D

36-MONTH ROLLING CORRELATIONS AMONG VARIOUS MSCI REGIONS AND THE GOLDMAN SACHS COMMODITY INDEX IN LOCAL CURRENCY

January 1, 1970 - September 30, 2001



Source: Datastream International. MSCI data are copyrighted by and proprietary to Morgan Stanley Capital International, Inc.

Note: Goldman Sachs Commodity Index returns are in US$.