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Winner-Loser Reversals in National Stock Market Indices: Can They be Explained?

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ABSTRACT

This article examines possible explanations for "winner-loser reversals" in the national stock market indices of 16 countries. There is no evidence that loser countries are riskier than winner countries either in terms of standard deviations, covariance with the world market or other risk factors, or performance in adverse economic states of the world. While there is evidence that small markets are subject to larger reversals than large markets, perhaps due to some form of market imperfection, the reversals are not only a small-market phenomenon. The apparent anomaly of winner-loser reversals in national market indices therefore remains unresolved.

A NUMBER OF STUDIES, beginning with DeBondt and Thaler (1985), have shown the presence of "winner-loser reversals" in the U.S. stock market: stocks that have been "losers" in a given ranking period are likely subsequently to yield higher returns than the corresponding "winner" stocks. The differences in returns are striking, although the interpretation of these apparently anomalous results is less clear. In particular, it has been argued that the results may be subject to methodological problems and that the return differentials may primarily reflect differences in risk (e.g., Ball, Kothari, and Shanken (1995)).

In a recent article (Richards (1995)), I present preliminary evidence for similar winner-loser reversals in national stock market indices. This article extends and explores that finding, using data for the return indices of 16 national markets for the period 1970–1995. I find that reversals are strongest around the 3-year horizon where test-period return differentials have averaged more than six percent per annum in the period since 1970. This result is clearly related to findings that excess returns on national market indices display negative autocorrelation or can be predicted by dividend yields (e.g., Poterba and Summers (1988), Cutler, Poterba, and Summers (1991)). However, it differs in that winner-loser reversals indicate negative autocorrelation in returns *relative to other markets* and suggest, therefore, that earlier findings of mean-reverting behavior in national markets are unlikely to be due purely to a common mean-reverting world component.

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The primary question that this article addresses is whether or not the findings of large return differentials over periods of several years are compatible with market efficiency. Under the assumption that national markets were sufficiently open in the sample period to allow international investors to remove any incipient mispricing, winner-loser effects would be evidence for market inefficiency, unless they could be explained by differences in risk exposures. It is, of course, debatable whether markets were sufficiently open, because many countries placed controls on foreign exchange transactions and cross-border equity investment in the early part of the sample period.[1] In many cases, however, regulations may not have been binding barriers to international investment, either because they could be evaded or because permission to conduct transactions may have been close to automatic.

Indeed, tests of international asset pricing models provide results that appear to be reasonably consistent with integration of national markets into a world market: Chan, Karolyi, and Stulz (1992, p.138) suggest, for example, that "There is now substantial evidence that stock markets are reasonably well integrated." A number of studies (e.g., Harvey (1991), Ferson and Harvey (1994)) do not reject the hypothesis that the world market is unconditionally mean-variance efficient. And, while Harvey (1991) rejects the conditional efficiency of a world index, he finds that a conditional capital asset pricing model (CAPM) has a significant degree of explanatory power for expected excess returns across most countries. Based on this evidence, this article proceeds, for the most part, on the assumption that these markets were integrated in the sample period. Accordingly, and unlike previous cross-country studies of long-horizon predictability in domestic markets, this article adopts an explicitly international framework with common international risk factors, consistent with some recent studies involving short-horizon returns (e.g., Harvey (1991)). The risk of a contrarian strategy is assessed using two primary methodologies. First, with risk measured in terms of the covariance of returns with the world market return or other potential risk factors, I test for differences in the risk exposures of winner and loser portfolios. Second, I test whether loser portfolios tend to underperform winner portfolios in test periods that represent adverse economic states of the world, as measured either by large declines in the world index or by economic recessions. To foreshadow the results, the tests provide no support for a risk explanation of the winner-loser reversals. There is, however, evidence that reversals are stronger in smaller countries than in larger countries, which may be evidence for larger market imperfections in these countries.

The article is organized as follows. The methodology and data are outlined in Section I. Section II presents the evidence for winner-loser reversals. In Section III, I test for a risk-based explanation for the differences in test-period

[1] In addition, this period was characterized by regulations on brokerage commissions in some countries that increased the costs of trading, and by the absence of index futures contracts that might have effectively prevented short-selling.

returns on winners and losers, and I test in Section IV for other explanations. Section V concludes.

I. Methodology and Data

The methodology used in this article is similar in most respects to that of DeBondt and Thaler (1985). However, in this study, which builds on findings in Richards (1995), the focus is on the return indices for the national stock markets of 16 countries that are treated as 16 different assets. I calculate the returns for each of the 16 countries over a k-month "ranking period" and divide the countries into four portfolios based on total returns in this period. The four countries with the lowest (highest) returns are referred to as the losers (winners) and are placed in portfolio one (four). Based on market capitalization weights at the end of the ranking period, the performance of the four portfolios in the ranking period and in the subsequent k-month "test period" is calculated. Values for k of 3 to 60 months are simulated using data from December 1969 to December 1995. I refer to the simulated returns on the portfolios as "trading rule" outcomes, and I define the return on a "contrarian" (or zero-net-investment) portfolio to be the return on the loser portfolio less the return on the winner portfolio. Under the null hypothesis of no predictability of returns, the performance of the portfolios in the test period should be independent of the ranking-period returns.

This article deviates, however, from DeBondt and Thaler's methodology in four ways. First, returns for each portfolio are buy-and-hold returns over the entire k-month period, rather than the sum of monthly percentage returns. Second, average portfolio returns are calculated using the geometric average of the return relatives of all test outcomes, rather than the arithmetic average of percentage returns: this may be a solution to the problem of skewness in returns identified by Ball *et al.* (1995). Third, given the relatively short data sample, overlapping returns data are used to increase the power of statistical tests. The trading rules are replicated at the end of every quarter in which they are feasible and the mean returns for each horizon are the average of all these replications. Finally, this article uses simulated rather than theoretically derived critical values to assess the statistical significance of the return on the contrarian portfolio. I use the numerical technique of bootstrapping and obtain simulated data series by resampling the innovations in the relevant series (the return indices and market capitalizations, both in logarithms). This methodology will account for the moving-average error in overlapping data. Tests for significance are based on the distribution of the winner-loser return differential under the null hypothesis of no temporal dependence in returns.[2]

The significance tests for the returns on the contrarian portfolio should, of course, be regarded only as illustrative, since alternative techniques would

[2] Monte Carlo simulations indicate that when all countries have similar expected rates of return, the contrarian portfolio has a zero expected return: that is, there is no bias corresponding to the bias in estimated autocorrelations.

yield somewhat different critical values. In addition, it must be acknowledged that the short data set allows only a small number of nonoverlapping tests for the longer horizons—seven in the case of the 3-year horizon that is the focus of much of the analysis. This will, however, be reflected in wide confidence intervals derived from the bootstrapped simulations that use data sets of similar length, and in a correspondingly low likelihood of rejecting the null hypothesis of no temporal dependence in returns. Similarly, in the case of tests for differences in risk exposures, the short data sample will make it difficult to reject the null hypothesis of similar risk exposures.

As in many other studies of international stock pricing, this study uses the Morgan Stanley Capital International (MSCI) indices for total returns (capital gains plus dividends) in U.S. dollars. The indices are composed of high capitalization, heavily traded stocks and are unlikely to be subject to the bid-ask spread biases that may affect winner-loser tests within national markets. End-of-month data from December 1969 to December 1995 for the following sixteen markets are used: Australia, Austria, Canada, Denmark, France, Germany, Hong Kong, Italy, Japan, the Netherlands, Norway, Spain, Sweden, Switzerland, the United Kingdom, and the United States.[3]

II. Evidence for Winner-Loser Effects Across 16 National Markets

Results for the winner-loser tests are shown in Table I. At horizons of one year or less, the test-period returns in Panel B suggest some modest (and statistically insignificant) positive autocorrelation in relative returns, consistent with evidence for U.S. stocks in Jegadeesh and Titman (1993), for international stocks in Rouwenhorst (1997), and for national indices in Asness, Liew, and Stevens (1996). This "momentum" effect is strongest at the six-month horizon where winners continue to outperform losers, by an annualized 3.4 percent.[4]

However, at horizons of more than one year, ranking-period losers begin to outperform ranking-period winners. The 3- and 4-year horizons show the highest returns to the contrarian strategy, with average annual returns of 6.4 and 5.8 percent, significant at the 1.8 and 4.0 percent levels, respectively.[5] These results are due to return reversals in both winners and losers. At the 5-year horizon, returns to the contrarian strategy are initially strongly positive, but the reversals end after three or four years, consistent with the

[3] With the exception of Belgium and Singapore/Malaysia, which were not available, the 16 countries include all those for which the MSCI indices are calculated from December 1969.

[4] Using estimates of gross domestic product (GDP) for the 16 countries, I have examined both the average GDP growth rates of the return-ranked portfolios and the average returns for portfolios formed based on GDP growth rates. The results (available on request) suggest that the short-term momentum in returns is not associated with GDP outcomes. More surprisingly, the ranking period return differentials do not appear to be correlated with GDP growth rates at any horizon, though this result may be due to the poor quality of quarterly GDP data for some of the countries or to the need to decompose GDP changes into expected and unexpected components.

[5] If the Newey-West correction is instead used to estimate significance levels, the significance levels are less than 1 and 2 percent, respectively.

Table I

Testing for Winner-Loser Effects Among National Stock Market Indices: End-of-Quarter Data, December 1969–December 1995

This table summarizes the ex post simulation of a trading rule in which the performance of 16 national stock markets in a k-month ranking period is used to choose portfolios to be held for the subsequent k-month test period. Portfolio 1 (4) comprises the four weakest (strongest) markets in the ranking period, and the contrarian portfolio is long portfolio 1 and short portfolio 4. Market-capitalization weighted portfolios are formed at the end of each quarter and average returns are calculated as the geometric average of all test outcomes. Returns for portfolios 1 to 4 are calculated relative to the return on the world market portfolio. 90 percent confidence intervals are based on 5000 simulations of bootstrapped data under the null hypothesis of no temporal dependence in returns.

Number of Months in Ranking and Test Periods	Portfolio 1 (losers)	Portfolio 2	Portfolio 3	Portfolio 4 (winners)	Contrarian Portfolio
Panel A: Ranking-Period Average Annual Return					
3	−32.7	−9.2	9.5	53.7	−86.4
6	−25.7	−2.0	7.4	36.9	−62.6
12	−19.4	−5.0	6.1	26.8	−46.1
24	−15.4	−3.4	5.2	18.2	−33.6
36	−11.7	−1.9	4.6	15.0	−26.8
48	−9.6	−1.8	3.6	10.3	−19.9
60	−8.1	−1.8	3.2	9.4	−17.5
Panel B: Test-Period Average Annual Return					
3	3.3	−4.6	−2.6	6.4	−3.1
6	−1.9	−2.0	2.6	1.5	−3.4
12	−2.7	2.1	2.6	−0.4	−2.3
24	1.2	2.9	0.0	−4.0	5.2
36	3.2	2.0	−0.2	−3.2	6.4
48	2.7	1.9	0.8	−3.0	5.8
60	1.8	2.4	−1.1	−1.6	3.4
Panel C: Empirical 90 Percent Confidence Interval for Test-Period Return					
3	−4.1, 4.2	−3.6, 3.6	−3.6, 3.6	−4.1, 4.3	−6.1, 6.2
6	−3.5, 3.5	−2.8, 2.8	−2.8, 2.7	−3.5, 3.7	−5.1, 5.1
12	−3.5, 3.3	−2.4, 2.3	−2.3, 2.4	−3.4, 3.5	−5.0, 4.9
24	−3.5, 3.2	−2.4, 2.1	−2.2, 2.3	−3.3, 3.9	−5.4, 5.0
36	−3.8, 3.3	−2.6, 2.2	−2.3, 2.4	−3.5, 4.2	−5.8, 5.3
48	−4.1, 3.5	−2.7, 2.2	−2.4, 2.6	−3.7, 4.4	−6.3, 5.5
60	−4.3, 3.7	−2.9, 2.4	−2.6, 2.8	−3.9, 4.8	−6.6, 5.9

time-decay of return differentials seen in various price-based "anomalies" in the U.S. stock market.

Figure 1 shows the average annual return on the 3-year contrarian portfolio, for each of the 81 end-of-quarter portfolio formation dates from the end of December 1972 to the end of December 1992. The most recent data could provide some evidence that the positive returns to the contrarian strategy may

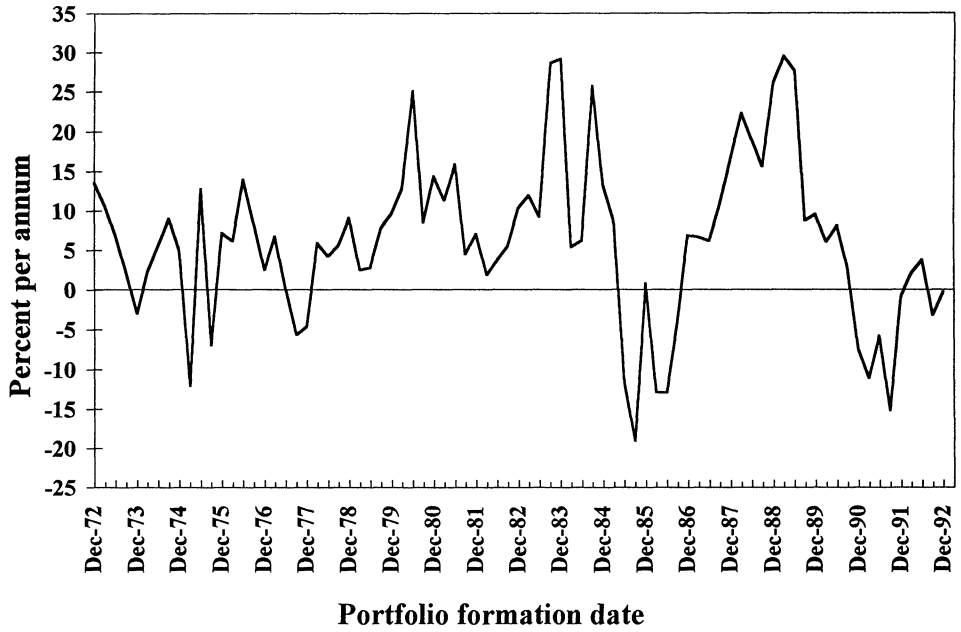

Figure 1. Average annual winner-loser reversal. At the end of each quarter from the end of December 1972 to the end of December 1992, the performance of 16 national stock market indices in the prior 3-year ranking period is used to allocate countries to 4 portfolios, each of 4 countries. The figure shows the simulated average annual percentage return on the contrarian portfolio (which is long the loser portfolio and short the winner portfolio) over the subsequent 3-year test period.

have faded recently: none of the contrarian portfolios formed after June 1990 would have yielded a return that was above the historical average, and in some cases they would have yielded large negative returns. A longer perspective would not, however, suggest that returns have fallen: the average annual return would actually have increased slightly from 6.2 percent in the first half of the sample period to 6.7 percent in the second half. This result suggests that it may be premature to conclude that increases in the volume of international investment in recent years have removed any apparent profits from the strategy, although the most recent results caution against drawing any firm inference from this short sample.

In order to assess whether the winner-loser reversals identified here reflect equity or currency market behavior, in results available upon request, I have divided the returns in Table I into hedged equity returns and currency (plus interest rate) returns. The results indicate that the differences in returns identified in both ranking and test periods are due predominantly to equity market behavior. However, when currency return rankings are used to form currency portfolios, there is also some modest evidence for momentum at short horizons and reversals at longer horizons. That is, the pattern of return autocorrelations appears to be reasonably similar in the equity and currency

markets, and consistent with the general pattern of "speculative dynamics" proposed by Cutler *et al.* (1991).

III. Can Differences in Risk Explain the Winner-Loser Reversals?

A. Simple Measures of Risk

While there is a large body of evidence that the stock markets in this study have been significantly integrated into a world market, the relevant measure of risk in segmented markets would be the standard deviation of returns. When the standard deviations of returns for the 3-year trading rule portfolios are calculated over return horizons of one quarter, one year, and three years, the results (available upon request) indicate that the loser portfolio would have had a lower standard deviation than the winner portfolio at all horizons. That is, the loser portfolio appears to have dominated the winner portfolio in unconditional mean-variance terms, with a higher return and a lower variance over all horizons. There is, therefore, no evidence that loser countries are more prone to greater variance in test-period returns than winner countries.

Another simple "risk" measure might be the average portfolio dividend yield which, according to standard valuation models, can be thought of as determined by required rates of return (and expected dividend growth rates). Indeed, the data reveal large changes in dividend yields during the ranking period. For example, the dividend yield on the 3-year loser portfolio rises from 3.5 percent at the start of the ranking period to 4.4 percent at the end of the ranking period, while the yield on the winner portfolio falls from 3.9 to 3.0 percent. These changes would be consistent with the risk of losers having increased and the risk of winners having fallen in the ranking period. However, an alternative interpretation of the changes in yields is that they are the result of price changes unrelated to risk (or dividends): since prices have typically fallen in loser countries, the dividend/price ratio should, ceteris paribus, have risen. To help distinguish between these two explanations, the following sections present tests for differences in risk in test-period returns.

B. Testing for Differences in Risk Exposures

Ball and Kothari (1989) provide evidence that the market risk of U.S. winners and losers changes during the ranking period and that loser stocks have significantly higher betas than winner stocks in the test period. To examine the possibility of similar effects in national markets, I test in this section for differences between the winner and loser portfolios in their test-period risk exposures to prespecified risk factors. The first risk factor is the excess return on the MSCI World Index; tests of international asset pricing models, both conditional (e.g., Harvey (1991)) and unconditional (e.g., Ferson and Harvey (1994)), invariably suggest that world stock market risk is the most important form of risk for stock portfolios. Second, given that asset pricing theory suggests a role for exchange rate risk (see, e.g., Stulz (1995), I also include the excess dollar return on a trade-weighted portfolio of short-

term assets in 10 foreign countries (the G-10 excluding the United States, plus Switzerland), similar to the measure proposed in Harvey (1995).[6] A one-factor model using only the world market return is first estimated, and this model is then supplemented by the exchange rate factor.[7] To check the robustness of the results from using these prespecified factors, I also present results for a simple alternative model where the factors are based on the first two principal components of ex post quarterly returns in the 16 countries.

Risk exposures are estimated via the following regression,

$$R_{pt} = \alpha_p + \sum_{i=1}^{j} [\beta_{pi} F_{it} + \delta_{pi}(F_{i,t-36} - \bar{F}_i) * F_{it}] + \epsilon_{pt}, \quad (1)$$

where: R_{pt} is the average annual excess U.S. dollar return on portfolio p in the 36 months from period t (the test period); F_{it} is the annualized outcome for factor i for the same period; the term in parentheses is the amount by which the factor outcome in the 36 months before period t (the ranking period) exceeded its long-term average; δ_{pi} is a parameter allowing for the risk exposure of a portfolio to depend on the factor outcome in the ranking period; and ϵ_{pt} is a disturbance term that may not be white-noise due to the use of overlapping data. Three-year returns are used based on evidence that dispersion in CAPM betas increases with the return interval, and log differences rather than percentage changes are used to minimize problems of nonnormality. Following Kothari and Shanken (1992) and Ball *et al.* (1995), I allow for the possibility of nonstationarity of risk exposures by including an interaction term that allows exposures to vary based on the factor outcome in the ranking period. For example, one might expect that in ranking periods in which the overall world market return is unusually high, there will be a tendency for the winner (loser) portfolios to consist mainly of high (low) beta countries, and vice versa when the market return is low. The parameter estimates for the interaction term are not reported but generally are of the expected sign. Overlapping data are again used, and standard errors are estimated using the Newey-West correction to account for the moving average error structure.

The results in Table II show the average risk exposures for the test-period returns and provide no support for the hypothesis that returns on losers were riskier in the sample period than returns on winners. If losers were riskier than winners, the contrarian portfolio should show a positive exposure to risks that carry positive risk premia, and the risk-adjusted constant term should be less than the average unadjusted return. The results indicate, however, that

[6] Dumas and Solnik (1995) and Harvey, Solnik, and Zhou (1994) provide evidence that exchange rate factors affect the pricing of bonds, but perhaps not stocks. Harvey (1995) shows that national stock market returns are typically correlated with a dollar exchange rate variable, though the sign of the risk exposure often depends on the currency of measurement.

[7] To test for possible differences in other risk factors, in other regressions I have included three other risk factors suggested by Harvey, Solnik, and Zhou (1994)—the change in the price of oil, G-7 inflation, and the change in G-7 industrial production—but these are not significant.

Table II

Testing for Differences in Risk Exposures

This table shows estimates of risk exposures in a 3-year test period of portfolios of country indices formed on the basis of performance in the prior 3-year ranking period. The table reports estimates of α (the constant term) and β (the average risk exposures) for the winner and loser portfolios (each of 4 countries), and contrarian portfolio (which is long portfolio 1 and short portfolio 4). Risk exposures are estimated via the following regression,

$$R_{pt} = \alpha_p + \sum_{i=1}^{j} [\beta_{pi} F_{it} + \delta_{pi}(F_{i,t-36} - \bar{F}_i) * F_{it}] + \epsilon_{pt}, \quad (1)$$

where: R_{pt} is the average annual excess U.S. dollar return on portfolio p in the 36 months from period t (the test period); F_{it} is the annualized outcome for factor i for the same period; the term in parentheses is the amount by which the factor outcome in the 36 months before period t (the ranking period) exceeded its long-term average; δ_{pi} is a parameter allowing for the risk exposure of a portfolio to depend on the factor outcome in the ranking period; and ϵ_{pt} is a disturbance term that may not be white-noise due to the use of overlapping data. Returns and factor outcomes are defined as log differences multiplied by 100, so that the constant term corresponds approximately to an annual percentage return. Standard errors are shown in parentheses and are estimated using the Newey-West correction to account for the moving-average error term from the use of overlapping data. The risk factors are: WMR, the excess U.S. dollar return on the Morgan Stanley Capital International (MSCI) World Index; FXR, the excess U.S. dollar return on a portfolio of foreign currency short-term assets in 10 foreign markets; and PC1 and PC2, factors based on the first two principal components of the data for quarterly stock returns in 16 countries. A constant term is included for the principal component regressions, although it is less meaningful because the factors are not traded asset returns.

Risk Factors		Constant Term			Exposure for Factor 1			Exposure for Factor 2		
Factor 1	Factor 2	Loser Portfolio	Winner Portfolio	Contrarian Portfolio	Loser Portfolio	Winner Portfolio	Contrarian Portfolio	Loser Portfolio	Winner Portfolio	Contrarian Portfolio
WMR	–	1.7	−6.2	7.9	1.13	1.28	−0.15	–	–	–
		(1.9)	(2.2)	(3.5)	(0.18)	(0.11)	(0.25)	–	–	–
WMR	FXR	3.4	−5.9	9.3	0.87	1.16	−0.29	0.19	0.40	−0.21
		(1.5)	(2.4)	(3.5)	(0.11)	(0.15)	(0.24)	(0.10)	(0.22)	(0.28)
PC1	PC2	12.5	6.4	6.1	0.09	0.11	−0.02	0.00	0.04	−0.03
		(1.0)	(1.0)	(2.2)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)

the constant term for the contrarian portfolio increases from 6.4 percent to 7.9 and 9.3 percent when regressed on the prespecified factors: the latter are significant at the 3 and 1 percent levels, respectively. And, while not statistically significant, the world return exposure for the contrarian portfolio is estimated to be negative in both cases, suggesting that the loser portfolio might have been less risky than the winner portfolio. There is also no significant difference in the winner and loser portfolios' exposures to the exchange rate factor, but since world market returns are associated positively with this factor, the estimated negative exposure for the contrarian portfolio again suggests that the loser portfolio was not more risky than the winner portfolio. The results for the principal component factors are less easily interpreted because the risk factors are not traded asset returns, but broadly confirm these

results: the contrarian portfolio's constant term is significantly positive and its exposures to both risk factors are estimated to be negative.

The lack of significant differences in risk exposures for the winner and loser portfolios in Table II may be a reflection either of the short data sample or of the true absence of consistent and significant risk differences between winner and loser countries: only a longer sample period will shed further light on this question. However, an alternative possibility is that the observed return differences may reflect time-varying equilibrium expected returns that cannot be captured by regressions using unconditional returns. A test of this possibility is suggested by Ferson and Korajczyk (1995) and involves adding a number of lagged information variables to the equations shown in Table II to allow, in a simple way, for time variation in expected returns. A simple F-test on the inclusion of three instruments that have been used in previous work—the dividend yield on the world market, and a short- and long-term U.S. interest rate—suggests that these instruments have some explanatory power for the return on the contrarian portfolio. While this result may be partly due to the bias in the F-statistic from the use of overlapping data, it could be viewed as evidence that there were differences in the expected rates of return of winner and loser portfolios. However, the most significant correlation with the contrarian return tends to be with the world dividend yield, and is negative in sign. And since tests of short-term predictability (e.g., Solnik (1993)) suggest that expected returns are positively associated with the dividend yield, the negative correlation for the contrarian portfolio would suggest that the loser portfolio may have had a *lower* expected return than the winner portfolio. For the present, therefore, and subject to the uncertainties of the short sample, the results of this section indicate that the loser portfolio does not appear to be more risky than the winner portfolio, and may indeed be less risky.

C. Testing Portfolio Performance in Adverse Economic States

An alternative way to assess the risk of the contrarian strategy is suggested by Lakonishok, Shleifer, and Vishny (1994) who note that losers should be regarded as riskier if they tend to underperform winners in "bad" states of the world in which the marginal utility of wealth or consumption is high. Those authors suggest that "Performance in extreme bad states is often the last refuge of those claiming that a high return strategy *must* be riskier, even when conventional measures of risk such as beta and standard deviation do not show it" (Lakonishok *et al.* (1994) p. 1569, emphasis in original). To address this issue, I assume that states of the world can be classified by the excess return on the world market portfolio or by the growth in industrial production in the G-7 economies, and I analyze the performance of each portfolio in the different states. In the case of the stock market outcomes, this analysis can be viewed as testing whether the contrarian portfolio might have different betas in up- and down-markets.

Table III

Average Performance of Portfolios in Different Economic States

This table shows the average annual percentage return in different "economic states" of portfolios, each consisting of 4 country indices, formed on the basis of returns in 16 countries in the prior 3-year ranking period. Economic states are defined based either on the test-period excess return on the Morgan Stanley Capital International (MSCI) World Index or on the average growth of industrial production in the G-7 countries. Good (bad) states are defined as those where the state variable outcome is above (below) its long-term mean, and very good (very bad) states are defined as the highest (lowest) 10 percent of all outcomes.

	Portfolio 1 (losers)	Portfolio 2	Portfolio 3	Portfolio 4 (winners)
Panel A: State Variable—Quarterly Excess World Market Return				
Very bad states	−10.1	−10.2	−10.9	−13.8
Bad states	−0.1	0.0	−0.5	−1.1
Good states	7.1	6.1	5.8	5.3
Very good states	14.7	15.9	15.1	16.1
Panel B: State Variable—Annual Excess World Market Return				
Very bad states	−12.8	−13.5	−16.3	−22.9
Bad states	3.9	5.2	2.9	−0.2
Good states	23.6	21.0	17.5	16.3
Very good states	60.3	46.7	46.2	46.6
Panel C: State Variable—Annual Change in G-7 Industrial Production				
Very bad states	−1.1	−1.6	−5.3	−12.6
Bad states	18.3	17.8	16.2	9.3
Good states	15.0	13.7	10.2	11.3
Very good states	17.3	11.9	10.0	10.4

Panels *A* and *B* of Table III show the performance of the different portfolios where the world market return is used to classify periods into different states of the world. The data indicate that there is no evidence that the loser portfolio has any greater exposure to downside stock market risk than the winner portfolio over periods of either one quarter or one year. Indeed, the loser portfolio appears to outperform the winner portfolio in almost all states of the world. A similar result is shown in Panel *C* where the annual change in industrial production is the state variable. While there is a tendency for the stock market to perform poorly in the weakest output states, there is again no tendency for test-period losers to have underperformed winners in these adverse economic states; instead, losers appear to outperform winners in all states.

In summary, there is no evidence that returns to the loser portfolio were riskier than returns to the winner portfolio either in terms of standard deviations, covariance with potential risk factors, or performance in adverse states of the world. A simple risk-based explanation for the winner-loser reversals identified in this paper therefore seems unlikely. It is, of course, possible that

other risk factors may have been at work, including the possibility that capital controls or expropriation were judged to be more likely in loser countries, but such "peso problem" explanations are essentially impossible to test.

IV. Other Possible Explanations for Winner-Loser Reversals

Based on evidence that U.S. winner-loser reversals contain a strong January component (see, e.g., Ball *et al.* (1995)), it is worth considering whether this factor also contributes to international reversals. In this case, it seems unlikely, given that the results in Table I are the average of four different (end-of-quarter) portfolio formation dates. Nonetheless, in results available upon request, I have calculated January returns to the 3-year contrarian strategy for all 21 December portfolio formation dates, since end-of-year factors should affect these portfolios most. The average return in the first January, when any biases should be strongest, is 1.8 percent. The average return in the second January is a surprising 3.2 percent, with a zero return in the third January. These results indicate that only a modest proportion of the total 3-year return of 23.1 percent occurs in January. Therefore, unlike in winner-loser studies of U.S. stocks, the reversals in this article do not appear to be primarily a January phenomenon.

More importantly, if the winner-loser reversals identified above are due solely to the behavior of the smaller, less developed, or less open markets, analogous perhaps to the small-firm aspects of U.S. reversals (see, e.g., Ball *et al.* (1995)), there would be less justification for a claim that they represent an anomaly. The possibility of this factor is reduced, however, by the use in this study of capitalization- rather than equally-weighted portfolios. In addition, the data in Panel *A* of Table IV for the average proportion of world market capitalization in each portfolio at the start of the test period imply that there is no marked country-size bias in the portfolio selection process.

Nonetheless, it is possible that instances of large return reversals might tend to occur when the extreme portfolios consist mainly of small countries. To examine this, I divide the time series of returns for each ranked portfolio according to whether the proportion of world market capitalization at each portfolio formation date is below or above the median for that portfolio. The results in Panel *B* of Table IV indicate that winner-loser reversals tend to be larger (8.6 versus 4.1 percent) in those periods when the extreme portfolios contain mainly smaller countries. Thus, there is evidence that small countries contribute disproportionately to the estimated positive return on the contrarian portfolio.

For further evidence on this effect, I conduct winner-loser tests on two separate groups of eight countries, which are allocated to four portfolios of two countries each. The 16 countries are divided based on average market capitalization for the full sample period, with the larger markets (the United States, Japan, the United Kingdom, Canada, Germany, France, Australia, and Switzerland) tending to be those with more developed capital markets and with fewer controls that would have hindered foreign investment during the

Table IV

The Role of Country Size in Winner-Loser Reversals

This table examines the role of country size in the 3-year test-period performance of portfolios of country indices, formed based on returns in 16 countries in the prior 3-year ranking period. Panel A shows the average share of total market capitalization that the markets in each portfolio represent at the end of the ranking period (or start of the test period). Panel B shows the average test-period returns where the time series for the test-period return on each portfolio is divided based on whether the share of total market capitalization at the start of the test period is above or below the median share for that portfolio over the entire sample. Panel C shows the simulated results of 3-year winner-loser trading rules where the 16 markets are divided into two groups based on average market capitalization over the full sample period. Within each group, winner-loser tests are conducted with four portfolios, each of two countries.

	Portfolio 1 (losers)	Portfolio 2	Portfolio 3	Portfolio 4 (winners)	Contrarian portfolio
Panel A: Average Share of Total Market Capitalization (percent)					
All countries	26.6	22.4	25.9	25.1	n.a.
Panel B: Test-Period Returns Divided by Share of Portfolio in Total Market Capitalization (percent)					
Above median	1.2	2.3	−0.6	−3.0	4.1
Below median	5.1	1.8	0.1	−3.5	8.6
Panel C: Winner-Loser Reversals in Large and Small Markets					
Ranking-period average annual return (percent)					
Large markets	−9.8	−1.8	3.4	12.7	−22.5
Small markets	−13.1	−2.4	6.4	19.3	−32.4
Test-period average annual return (percent)					
Large markets	2.8	0.5	−0.4	−1.8	4.6
Small markets	2.0	4.5	−1.1	−5.7	7.7

sample period.[8] The results for the 3-year horizon are shown in Panel *C* of Table IV. They indicate that the average annual ranking-period return differential between winners and losers was larger in the smaller markets than in the larger markets (32.4 versus 22.5 percent). This result (which is consistent with the higher short-term volatility of returns in these markets) indicates that country-specific movements in asset prices tend to be larger in smaller markets, perhaps because economic and financial shocks in smaller countries are not transmitted to other countries as much as similar shocks in large countries.

Further, the average annual test-period return to the contrarian strategy is also estimated to be larger for the smaller markets than for the larger markets (7.7 versus 4.6 percent), although the difference is not significant because of

[8] For example, using the P1 index of Demirgüç-Kunt and Levine (1995) which is calculated using data from 1986–1993 for 41 mature and emerging markets and is normally distributed around zero, the average development indices for the larger and smaller markets are 1.07 and 0.10, respectively.

the wide confidence intervals obtained with less diversified portfolios. The larger test-period reversals in the smaller markets may not be surprising in light of their greater return volatility. Nonetheless, it suggests that smaller markets are subject either to greater differences in risk or to larger market imperfections.[9]

One possibility is that the smaller size of these markets, together with the larger falls experienced by losers, was perceived to have increased the probability of some form of capital controls, expropriation, or other "nonsurvival" in loser countries, and therefore increased their required rates of return. A problem with this potential explanation is that the larger return to the contrarian strategy in small markets is due primarily to the behavior of the small winners rather than the small losers. In addition, if small losers are subject to survival risk, test-period returns in such markets would presumably be especially sensitive to world market returns and other risk factors that affect survival. To test this, I have examined the risk exposures of portfolios of small losers and large winners. The results (available on request) suggest that small losers were not riskier than large winners, implying that imperfect integration or some other form of market imperfection may instead be the cause of the larger reversals observed in smaller markets.

Whatever the explanation for this puzzle, it should be remembered that reversals are still observed in larger markets, so they cannot be considered a small-market phenomenon only. For a further analysis of this, in results available upon request, I have calculated the average test-period return for each country (relative to the world market) for the periods when that country was an extreme loser or winner. While the largest winner-loser return reversals are observed for two small markets (Norway and Denmark, with differentials of 23.5 and 16.8 percent per annum, respectively), the United States, the largest and most probably most open market, also demonstrates substantial reversals (8.3 percent per annum).

V. Conclusion

This article has explored potential explanations for reversals in the relative performance of national stock markets over periods of several years. The major result of the article is the absence of any support for the hypothesis that the reversals reflect risk differentials. There is no evidence that test-period returns of prior losers were significantly riskier than those of prior winners, either in terms of their standard deviations, their correlations with the world market return or other risk factors, or their performance in adverse states of the world. However, there is evidence that winner-loser reversals were larger among the smaller markets than the larger markets, so there may be an

[9] Richards (1996) shows that the tendency for smaller markets to have larger ranking- and test-period return differentials holds also for emerging markets, which tend to be smaller and less open than the markets studied here.

element of a "small-country effect," perhaps related to some form of market imperfection.

One interpretation of the results might be that reversals are the result of cross-border equity flows being insufficiently large to remove mispricing, perhaps due to investors' fears of expropriation or capital controls. If this explanation is accepted, it might be expected that any apparent profit opportunities will be eliminated as markets become more integrated and cross-border holdings increase. Preliminary evidence for this view might be found in the observation that the contrarian strategy would have yielded below-average returns near the end of the sample period.

Another interpretation would be that it may not be realistic to expect arbitrage to remove all price discrepancies given the uncertainty in the valuation of equities, the high volatility of returns, and the apparently long time required for mispricing to be removed. Furthermore, if fads and investor misperceptions do exist, it is possible that increases in cross-border flows may actually add to the degree of mispricing because they imply that there will be more investors to "jump on the bandwagon" of the moment: the financial press often refers to "momentum investors" who buy whatever is currently "hot." Indeed, U.S. investor inflows into country and region funds often appear to be positively correlated with recent performance, consistent with a recent study of the premiums and discounts on country funds by Hardouvelis, La Porta, and Wizman (1994), which suggests that investors undergo swings in sentiment about foreign countries.[10]

The short data sample, the relatively small number of countries, the possibility of imperfect integration of markets, and the lack of a generally accepted asset pricing model combine to make it difficult to distinguish between these possible interpretations. The absence of an explanation for the winner-loser reversals in national market indices may not, however, be surprising given that researchers still differ in their assessment of the causes of price-based anomalies in the U.S. market.

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[10] Moreover, it seems plausible that even "prudent" institutional investors (as opposed to "speculative" ones) might tend to focus their investments in countries with high recent returns, while shying away from countries that have recently performed poorly. In particular, an investment in a recent winner may appear prudent regardless of its subsequent outcome, while an investment in a recent loser may appear foolhardy if it should subsequently perform badly (see also Lakoniskok, Shleifer, and Vishny (1994) and Shefrin and Statman (1994)).

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