Closed-end Country Funds and U.S. Market Sentiment

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Closed-end country funds can trade at large premiums and discounts from their foreign asset values (NAVs). Investigating this anomaly, we find that individual fund premiums move together, primarily because of the comovement of their stock prices with the U.S. market. Moreover, an index of country fund premiums differentiates size-ranked U.S. portfolio returns and forecasts county fund stock returns. These findings suggest that international equity prices are affected by local risk In particular, we show that country fund premium movements reflect a U.S.-specific risk, which may be interpreted as U.S. market sentiment.

Closed-end funds are investment companies whose sole earning asset is a portfolio of publicly traded securities. This portfolio is 'marked to market," and its net asset value (NAV) is reported every week (e.g.,

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in *Barron's* and the *Wall Street Journal).* One of the most perplexing anomalies in finance has been the empirical observation that closed-end funds' share prices (SPs) typically do not equal their NAVs. Historically, discounts (where the SP is less than the NAV) are the rule; however, premiums (where the SP is greater than the NAV) have become more common.[1]

This article focuses on a relatively new class of closedend funds-the foreign country fund. These country funds invest solely in securities that trade in a specific foreign market. Prior to 1986, only four country funds were listed on U.S. exchanges (Japan, Mexico, First Australia, and Korea). However, by December 1990, more than 30 country funds were trading in the United States. Like their domestic counterparts, country funds often trade at large premiums or discounts from their NAVs. In this study, we discuss existing explanations for this anomaly and present new evidence about the time-series behavior of country fund premiums, NAVs, and prices.

Our investigation is motivated by two streams of literature. First, closed-end country funds offer an attractive research design with which to examine international equity pricing. Prior studies have modeled varying degrees of global market segmentation.[2] In a fully integrated market, only the systematic risk relative to a world market portfolio is price&local (or national) risks do not affect prices.[3] Conversely, in a fully segmented market, only risk associated with the local market factor is priced. Although the share prices of country funds are established in the United States, their asset values are determined abroad, in foreign markets. If different risk factors affect the U.S. and foreign markets, these risks will be reflected in fund premium movements. Therefore, time variation in fund premiums should provide insights into the forces that move stock prices, both in the United States and abroad.

Second, country funds offer an excellent opportunity to revisit the closedend fund puzzle. Earlier attempts to explain the behavior of closedend fund discounts and premiums generally focused on mismeasurements of repotted NAVs. However, Zweig (1973) and, more recently, Lee, Shleifer, and Thaler (1991) propose an alternative explanation based on investor sentiment. According to this theory, fluc-

[1] Since discounts are merely negative premiums, hereafter we use the term "premiums" to refer to both negative and positive stock price deviations from NAV.

[2] See, for example, Black (1974), Subrahmanyam (1975), Stulz (1981), and Adler and Dumas (1983).

[3] In the framework of the Capital Asset Pricing Model (CAPM), the world market risk is captured by a single market portfolio factor. More generally, in a multifactor pricing framework, the world risk is represented by a set of common global risk factors. In either case, integration implies that asset prices are unaffected by nationalistic factors.

tuations in the discounts of closed-end funds reflect the differential sentiment of investors in the fund shares. Under costly arbitrage, these sentiments persist and are priced in equilibrium. Since shares of domestic closedend funds are held primarily by small individual investors, Lee et al. argue that the domestic fund discount is an index of these investors' optimism or pessimism relative to the broader market index.

One limitation of the Lee et al. (1991) analysis is their use of closed-end funds whose NAVs are computed using asset values established in the U.S. equity market. If market-wide sentiment in the United States affects both a fund's NAV and its SP, changes in this sentiment would not be reflected in the discount changes of domestic funds. Therefore, as Lee et al. acknowledge, their closed-end fund index measures only the *differential* sentiment of small U.S. investors relative to the broader market index.

Unlike domestic funds, the NAV of a country fund is not established in the same market as its SP. The literature on noise trading suggests that common sentiment arises when investors trade on "pseudo-signals," such as prior price and volume patterns, popular models [Shiller (1989)], or the forecasts of Wall Street gurus. To the extent that foreign investors are "sheltered" from this type of U.S. market sentiment, country fund NAVs will provide a value benchmark against which U.S. market movements may be examined.[4] Under the investor sentiment hypothesis, the premium of a country fund captures the differential sentiment between the U.S. and foreign markets.

To accommodate both market segmentation and sentiment-related characteristics, we hypothesize a multifactor pricing relation in which asset prices are affected by a common set of global risk factors, as well as by country-specific risk. International capital flow barriers prevent arbitrageurs from fully eliminating these country-specific risks. In this context, we show that premium changes for a portfolio of country funds reflect differences in the time-varying demand for equity between the U.S. and other foreign markets. That is, when U.S. investors have a greater demand for equity, they bid up (down) stock prices in the United States, causing country fund share prices to increase (decrease) relative to their NAVs. Interpreted in terms of investor sentiments, changes in the country fund premium index cap

[4] Pseudo-signals have the appearance, but not the substance, of news [see DeLong, Shleifer, Summers, and Waldmann (1990) or Shiller (1989)]. Trading on the basis of pseudo-signals is one source of "noise" trading, as described by Black (1986). Investors could, of course, be affected by common global sentiment If this sentiment affects both SP and NAV, it will have little effect on country fund premiums. Thus, a limitation of using country fund premiums as a measure of sentiment is that global sentiment cannot be distinguished from global fundamentals.

ture the time-varying optimism or pessimism of U.S. investors relative to their foreign counterparts.[5]

Consistent with this pricing relation, we find a systematic component in country fund premiums. That is, the premiums of individual country funds tend to move in tandem over time. In addition, although the domestic fund premium index identified by Lee et al. (1991) is not correlated with U.S. market returns, country fund premium changes do correlate positively with U.S. market returns. By separating each fund's premium changes into its SP and NAV components, we show that this common comovement arises because country fund SPs are more sensitive to U.S. market returns than their NAVs are. Indeed, after controlling for foreign market returns and exchange rate fluctuations, we find that changes in country fund SPs are correlated with U.S. market returns, while changes in their NAVs are not. Our results suggest the greater sensitivity of fund share prices to U.S. market returns is not due to nonsynchronous trading or exchange rate fluctuations.

We also document a correlation between country fund premium changes and size-decile excess returns in the U.S. market. Our results augment the Lee et al. (1991) finding that changes in domestic closed-end fund premiums differentiate cross-sectional U.S. stock returns. After controlling for overall market returns, we show that both domestic and foreign premium indices are related to size-decile returns. Specifically, both indices are positively correlated with excess returns on small firms-that is, small (large) market-capitalization firms are more (less) positively correlated with country fund premium changes. However, while sensitivity to the domestic fund index is negatively related to the level of institutional ownership [Chopra, Lee, Shleifer, and Thaler (1993a)], no such monotonic relation exists for the foreign fund index.

Finally, we investigate the usefulness of country fund premiums in forecasting future returns. If fund premiums reflect investor optimism and pessimism, and these sentiments are mean-reverting, then premium levels should predict future fund stock returns.[6] Prior research suggests that current premium levels are useful in predicting stock prices of domestic closed-end funds. Taking a similar approach with

[5] Note that the pricing relation we propose treats the source of the country-specific risk as exogenous. While we developed this pricing model with a behavioral-based hypothesis in mind, we acknowledge that it is also consistent with other forms of country-specific risk. However, if this risk pertains to an unknown macroeconomic factor, the evidence shows that it must affect only local prices.

[6] Note that investor sentiments need not be mean-reverting over reasonably short horizons. In fact, as DeLong, Shleifer, Summers, and Waldmann (1990) observe, if these sentiments were fully predictable, they would not be priced in equilibrium. Thus, our test requires that some amount of this sentiment mean-reverts over a relatively short time horizon.

country funds, we show that higher (lower) country fund premiums tend to be associated with lower (higher) future SP returns. This finding is consistent with the investor sentiment hypothesis. Interestingly, future NAV returns do not seem to be correlated with current premium levels.

Collectively our findings suggest a particular form of international market segmentation--one in which international asset prices are affected by both common global factors and local risk.. We find that fund premiums tend to be higher and more volatile for countries with more restrictive foreign ownership policies. However, even when cross-border pricing differences are transparent and trading restrictions seem minimal (e.g., Germany, France, Switzerland, and the United Kingdom), the effect of country-specific risk is evident.

More importantly, our findings suggest that movements in country fund premiums reflect a previously unidentified risk factor. We show that although this risk affects large groups of assets in the United States, it does not affect foreign assets. Our pricing relation treats the source of this risk as exogenous, and cannot firmly attribute it to U.S. market sentiment. However, we provide some preliminary evidence that country fund premiums are useful in forecasting fund SP returns, suggesting that this risk may be associated with the mean-reverting sentiment of U.S. investors.

The remainder of the article proceeds as follows. In the next section, we briefly review the closed-end fund literature and some existing explanations for discounts and premiums. Section 2 presents a multifactor return relation featuring country-specific risk. Section 3 addresses data and sample considerations. Section 4 presents evidence on the associations between country fund premiums, stock prices, net asset values, market index returns, exchange rates, and domestic fund premiums. Section 5 reports results on the relation between country fund premium changes and cross-sectional returns in the United States. Section 6 examines the ability of fund premiums to forecast future SPs and NAVs. Section 7 summarizes our findings and suggests directions for future research.

1. Relation to Prior Research

1.1 The closed-end fund puzzle

The pricing of closed-end fund shares has been studied since the 1960s. Earlier attempts to explain the behavior of fund discounts and premiums generally focused on the mismeasurement of reported NAVs [e.g., Pratt (1966), Roenfeldt and Tuttle (1973), Boudreaux (1973), Malkiel (1977)]. In this literature, three potential explanations are frequently mentioned: agency costs, tax liabilities, and illiquidity of assets.

The agency cost explanation is predicated on the fact that managerial ability is a "hidden asset or liability" not reflected in the NAV. Fund prices vary from NAV depending on the market's assessment of managerial talent and cost-excessive expenses and/or expected subpar performance reduces SP relative to NAV. On the other hand, the tax hypothesis argues that tax liabilities on unrealized capital appreciation (at the fund level) are not captured by the reported NAV. Finally, the asset illiquidity argument centers on fund assets that have trading restrictions (e.g., private placements and letter stocks), which may be overvalued in the NAV calculation.

While these factors help explain cross-sectional differences in fund premiums [Malkiel (1977), Pontiff (1993)], Lee et al. (1991) observe that they cannot account for all the evidence. Specifically, errors in reported NAV cannot answer four questions: (1) why overpriced closed-end funds get started in the first place [Laing (1987), Weiss (1989), Peavy (1990), and Hanley, Lee, and Seguin (1993)]; (2) why volatile fund premiums move together over time [Lee et al. (1991)]; (3) why, when funds are terminated (either through merger, liquidation, or conversion to a open-end fund), share prices converge to reported NAVs [Brauer (1984) and Brickley and Schallheim (1985)]; and (4) why profitable trading strategies can be derived through judicious use of publicly available information on premiums [Thompson (1978), Anderson (1986), Brauer (1988), and Sias, Starks, and Tinic (1993)].[7]

One explanation for these remaining questions is investor sentiment [Zweig (1973), DeLong, Shleifer, Summers and Waldmann (1990), and Lee et al. (1991)]. According to the investor sentiment hypothesis, fluctuations in the premiums of closed-end funds reflect the differential sentiment of investors in the fund shares. Since domestic closed-end fund shares are held primarily by small individual investors. Lee et al. argue that fund discount is an index of these investors' optimism or pessimism relative to the broader market index. When small investors are more optimistic (pessimistic) relative to the market as a whole, domestic fund premiums increase (decrease). At the same time, assets in which small investors are predominant will earn positive (negative) excess returns. The Lee et al. evidence is largely consistent with this hypothesis. In particular, they show domestic fund premium changes are positively correlated with excess returns on small firms and firms with low institutional ownership.

The Lee et al. (1991) study has been controversial and has spawned a series of further studies [e.g., Brauer (1992), DeLong and Shleifer

[7] See Lee, Shleifer, and Thaler (1991) for a more detailed discussion of these anomalies and their relation to cross-sectional results from prior studies.

(1992), Sias et al. (1993), Chen, Kan, and Miller (1993a, 1993b), and Chops, Lee, Shleifer, and Thaler (1993a, 1993b)]. The main objection to this study has focused on the economic significance of the sentiment index in explaining stock returns [e.g., Brauer (1992) and Chen, Kan, and Miller (1993b)]. However, Lee et al. acknowledges that their index of domestic funds will not capture market-wide movements in investor sentiment, since both the SP and NAV of domestic funds are subject to market-wide optimism and pessimism. Rather, as they point out, the domestic fund index reflects only the *differential* sentiment of small U.S. investors.

Country funds offer two important advantages for testing the sentiment hypothesis. First, the asset values of country funds are established abroad, in foreign markets. The noise trader literature suggests that common sentiment arises when investors trade on "pseudo-signals" that have the appearance, but not the substance, of news. To the extent that foreign investors are unaffected by U.S. "pseudo-signals," the NAVs of these funds should provide a useful value benchmark for evaluating U.S. market sentiment. Second, unlike domestic funds, country funds can be examined in relation to more than one market factor. These country fund characteristics allow us to separately evaluate the time-variation in SP and NAV components in the context of foreign and U.S. market movements.

1.2 Quasi-arbitrage

Another issue that has been explored in the literature is the question of why arbitrage forces do not eliminate closed-end fund discounts entirely. In fact, closed-end fund arbitrage strategies are neither costless nor riskless [e.g., Lee et al. (1991), pp. 83-84]. First, to establish a perfect dynamic hedge, an arbitrageur must mimic a funds portfolio. Since funds report their holdings on a quarterly (or, in many countries, semiannual) basis, timely duplication is difficult to accomplish. Second, since investors do not receive the full proceeds of a short sale, a hedge is not costless. Third, direct transaction costs (e.g., brokerage fees and bid-ask spreads) reduce the profit from hedging strategies. Finally, a hedge is only a pure arbitrage opportunity when the arbitrageur has an infinite time horizon. If an arbitrageur is forced to liquidate at some finite time, then she faces the risk that discounts may have widened since the time of the initial trade.

These market frictions form arbitrage bounds around reported NAVs, making trading on fund premiums, at best, a quasi-arbitrage. Despite the existence of professional arbitrageurs who trade on this information, closed-end fund SPs and NAVs still diverge.[8] In fact, variations

[8] Two examples of closed-end fund professionals trading on differences between SP and NAV

in the *size* of closed-end fund premiums are closely related to cross-sectional differences in the costs of arbitrage [see Pontiff (1993), and Bosner-Neal, Brauer, Neal, and Wheatley (1990)]. Since international arbitrage is more costly than domestic arbitrage, we observe larger premiums and discounts on country funds.

While arbitrage costs can help explain why some funds trade at greater average premiums than others, these costs do not explain why SPs deviate from NAVs in the first place. As Pontiff (1993) observes, without mispricing, arbitrageurs have nothing to arbitrage. Our study focuses on this mispricing, or the source of premium movements. Specifically, we are interested in why country fund stock prices diverge from their NAVs and how these movements relate to market returns in the United States and abroad. Consequently, our analysis focuses on the time series, rather than cross-sectional, behavior of country fund prices.

1.3 Market segmentation

The international asset pricing models of Black (1974) and Stulz (1981) suggest that when groups of equities are subject to different investment barriers, pricing relations across equity (country) groups also differ. Tests of this "market segmentation" hypothesis are largely of two types: static cross-section regression pricing tests and tests for discrete changes in prices of risk.[9] Collectively, these studies show that although international equity pricing is, to some extent, country specific, the cross-border heterogeneity is diminishing over time.

Country fund premiums provide an alternate (and more direct) examination of market segmentation. Country fund shares and their underlying assets are close substitutes and, in a fully integrated market, SP should equal NAV. Thus, non-zero country fund premiums imply some market segmentation. Moreover, a careful examination of the time variation in premiums should shed new light on the nature and extent of the segmentation in international markets.

1.4 Country fund premiums

The proliferation of U.S. country funds is a recent phenomenon, and academic studies on the subject are just emerging. Among the few

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are T. Hertzfeld and Assoc. of Miami, Florida, and Deep Discount Advisors of Asheville, North Carolina. This form of institutional arbitrage helps keep stock prices from diverging too far from NAVs.

[9] Cross-section pricing tests include Stehle (1977), Jaquillat and Solnik (1978), Errunza and Losq (1985), Jorion and Schwartz (1986), Cho, Eun, and Senbet (1986), Wheatley (1988), Bodurtha, Cho, and Senbet (1989), Bodurtha (1990), and Heston, Rouwenhorst, and Wessels (1992). Tests for discrete pricing changes are Gultekin, Gultekin, and Penati (1989) and Bonser-Neal, Brauer, Neal, and Wheatley (1990).

published works, Bonser-Neal et al. (1990) provide evidence that the level of country fund premiums is sensitive to announcements of changes in foreign country regulations that restrict investments. Bailey and Lim (1992) examine the benefits of international diver&-cation with country funds. They show that returns on fund stock prices are more highly correlated with U.S. market returns than the corresponding foreign indices are, and conclude that country funds may provide limited global diversification benefits. More recently, Chang, Eun, and Kolodny (1993), Johnson, Schneeweis, and Dinning (1993), and Diwan, Errunza, and Senbet (1993) compare the diversification benefits of direct investment into foreign country indices versus indirect investment using closed-end country funds. All three studies conclude that country fund shares offer some global diversification benefits, particularly for emerging economies (e.g., Brazil, Mexico, and Taiwan).

Two other concurrent studies are similar in spirit to our own. Urias (1992) examines the cross-sectional relationship of fund returns and the relation of individual premium returns to U.S. market returns, foreign market returns, and exchange rate changes. Urias finds that NAV returns explain "surprisingly little of fund returns" (p. 25) and that premiums are highly correlated across funds. Hardouvelis, La Porta, and Wizman (1993) also reports a common premium factor, but focus on the predictability of fund returns using individual fund premiums. In addition, Hardouvelis et al. report post-IPO premium erosion of about 20 percent over a 24 week period. Like this study, these two articles conclude that much of the evidence is difficult to reconcile with traditional pricing theories.

2. A Multifactor Returns Relation

Prior studies suggest that global markets can be characterized by a clientele-based returns relation with a single global risk factor and K local factors. Thus, we consider a multifactor return relation of the following form:

$$R_{it} = \alpha_i + \beta_i f_t + \sum_{k=1,K} \gamma_i^k s_t^k + \varepsilon_{it} \qquad (1)$$

where R_{it} is the return on the *ith* security, (α_i is the intercept term, β_i is the usual beta on the fundamental market factor f_t, and the ε_{it} are well-behaved error terms. In this relation, subscript t is the time marker and subscript k indicates the *kth* of K clienteles. An element of the second set of factors, s_t^k, represents the aggregate demand (or sentiment) of the *kth* investor clientele. The demands of individual

clientele vary over time for exogenous reasons, sometimes reinforcing and sometimes offsetting each other. Because arbitrage across clientele markets is costly, these time-varying demands persist and are priced in equilibrium. A particular security's pricing sensitivity to (or loading on) the *kth* local demand (sentiment) factor is γ_i^k.

Applying Equation (1) to closed-end country funds, we consider the case where each clientele corresponds to a single country. To simplify the discussion, we assume that only country-wide demands (sentiments) exist and that local demands (sentiments) do not affect returns in other countries. Under these conditions, the return relations for each funds NAV and SP are specified as follows:

$$R_{jt}^{NAV} = \alpha_j^{NAV} + \beta_j f_{jt} + \gamma_j^{NAV} s_{jt}^{NAV} + \varepsilon_{jt}^{NAV} \quad (2a)$$

$$R_{jt}^{SP} = \alpha_j^{SP} + \beta_j f_{jt} + \gamma_j^{SP} s_t^{SP} + \varepsilon_{jt}^{SP} \quad (2b)$$

where *NAV* or *SP* represents variables that correspond to the net asset value or stock price of the fund, respectively. In this specification, s_{jt}^{NAV} is the foreign market demand in country, *j*, f_{jt} is the fundamental risk factor for that country, and s_t^{SP} is the local U.S. market demand (sentiment). Share price and NAV are claims to the same fundamental assets, therefore the betas on the fundamental factors in Equations (2a) and (2b) are equal.

Since fundamental risk (f_{jt}) is not observable, we must use a proxy for this theoretical construct. One option is to use nonmarket-based macroeconomic measures, such as innovations in industrial production, interest rate term structures, inflation expectation, etc. However, most of these measures are not available at weekly intervals. Moreover, prior studies have shown that these measures do not adequately explain returns [see Chen, Roll, and Ross (1986) and Cutler, Poterba, and Summers (1989)]. Consequently, for our proxy, we use the value-weighted market return from each country, recognizing that if these measures are sentiment driven, then we bias our tests against finding significant sentiment-related results.[10]

Subtracting Equation (2a) from Equation (2b), we obtain the following expression for the return on the premium of fund *j:*

$$R_{jt}^{SP} - R_{jt}^{NAV} = \alpha_j^* + \gamma_j^{SP} s_t^{SP} - \gamma_j^{NAV} s_{jt}^{NAV} + \varepsilon_{jt}^* \quad (3)$$

The return on the premium of an equally weighted country fund port-

[10] The *j* subscript on f_{jt} reflects the literature on international market segmentation (footnote 9), which suggests that fundamental risk may vary across countries. We address this issue in our empirical tests by using different combinations of market returns to control for fundamental risk.

folio can now be written as

$$\bar{R}_t^{SP} - \bar{R}_t^{NAV} = \bar{\alpha}^* + \bar{\gamma}^{SP} s_t^{SP} - \bar{\gamma}^{NAV} \bar{s}_t^{NAV} + \bar{\varepsilon}_t^*, \tag{4}$$

where the overbar signifies the equally weighted average of the terms in Equation (3) over the set of available funds. In particular, $\bar{s}_t^{NAV}$ measures the local demand across all foreign markets. To the extent that local market demands (sentiments) are idiosyncratic, this variable will be close to zero. Solving for the local U.S. market demand (sentiment), we have

$$s_t^{SP} = (\bar{R}_t^{SP} - \bar{R}_t^{NAV} + \bar{v}_t)/\bar{\gamma}^{SP} \tag{5}$$

where

$$\bar{v}_t = -\bar{\alpha}^* + \bar{\gamma}^{NAV} \bar{s}_t^{NAV} - \bar{\varepsilon}_t^*.$$

Substituting back into the basic return relation, we can redefine returns for individual securities in the U.S. market as

$$R_{it} = \alpha_i + \beta_i f_{USt} + \gamma_i^* (\bar{R}_t^{SP} - \bar{R}_t^{NAV} + \bar{v}_t) + \varepsilon_{it}, \tag{6}$$

where $\gamma_i^* = \gamma_i^{SP}/\bar{\gamma}^{SP}$. This specification states that U.S. securities are priced in a two factor model. The first factor is the U.S. market fundamental factor, f_{USt}, and the second factor is a local U.S. market-wide factor that is proxied by the return difference between the SP and the NAV of the country fund portfolio.[11]

Interpreted in terms of the investor sentiment hypothesis, Equation (6) implies that bullish (bearish) U.S. investors will bid up (down) the price of country funds relative to their NAV, as well as the price of other U.S. assets. If this sentiment affects many assets, then it will not be diversified away and will be priced in equilibrium. Indeed, if different securities in the U.S. market have different sensitivities ("loadings", or γ_i^*) to this factor, then changes in country fund premiums should be related to cross-sectional differences in U.S. stock returns, just as are domestic fund premiums.[12] In Sections 4 and 5, we test several implications of this pricing relation.

[11] The presence of $\bar{v}_t$ term indicates this local U.S. demand variable is measured with error, but this noise biases our results against finding significance in the country fund premium measure.

[12] While this discussion has been cast in terms of country funds, it applies equally to the individual/institutional investor dichotomy discussed in Lee, Shleifer, and Thaler (1991). In that application, the share price (SP) clientele are small individual investors and the net asset value (NAV) clientele are institutional investors. Therefore, the premium on domestic funds can be interpreted as a proxy for the differential sentiment of small investors.

3. Sample and Data Issues

3.1 Sample description and data issues

Our initial sample consisted of 35 country funds that traded on U.S. exchanges during the 261-week period between January 2, 1986, and December 28, 1990. We excluded two funds (Emerging Germany and Emerging Mexico) that did not have returns data on CRSP, yielding a final sample of 33. For each fund, we collected weekly closing prices and net asset values from *Barron's*. Both fund stock prices and NAVs are reported in U.S. dollars. Typically each funds net asset portfolio is valued in local currency as of Friday's close in the foreign country and translated into U.S. dollars using the exchange rate in effect at that time. To form a domestic premium index, we also collected the SPs and NAVs for a set of domestic closed-end funds. For comparability we use the same set of domestic funds as Lee et al. (1991), except that we exclude two funds with foreign assets (the Japan and ASA funds).

For the 13 funds with at least 100 weekly premium and market return observations, we obtained data on exchange rates and returns on foreign market indices from Datastream. The Appendix lists the specific foreign market indices used and foreign market trading hours in local times. As indicated in the Appendix, when dividend information is available, the foreign market returns include these dividends. For seven countries, dividend information is not available, and these market returns do not include dividends paid.[13]

We compute weekly exchange rate changes by dividing the past weekending local currency U.S. dollar exchange rate by the current week-ending exchange rate. As our proxy for the U.S. market return, we use the dividend-adjusted weekly return on a value-weighted portfolio of New York (NYSE) and American (AMEX) Stock Exchange firms, as constructed from the CRSP tape. Institutional ownership data is obtained from the *Spectrum database,* which is based on 13-f filings to the Securities and Exchange Commission (SEC) and reflects ownership by U.S. institutional investors who manage over $100 million in equity assets.

For several tests, we, compute indices of weekly premiums: a domestic fund index *(DPI)* and a foreign country fund index *(FPI).* [14] These indices are constructed as follows:

$$DPI_t \text{ or } FPI_t = \sum_{i=1}^{n_t} PD_{it},$$

[13] We found that in countries with dividend information, the exclusion of these dividends had little effect on our results.

[14] The domestic index described here is equally weighted across funds. Repeating our tests with a value-weighted domestic index, we find no significant change in the results.

where

$$PD_{it} = \frac{SP_{it} - NAV_{it}}{NAV_{it}} \times 100,$$

SP_{it} = stock price of fund i at end of period t,

NAV_{it} = net asset value of fund i at end of period,

n_t = the number of funds with SP_{it} and NAV_{it} data available at the end of periods t and $t-1$.

We also compute changes in the two premium indices for the domestic funds ($\Delta\ DPI_t$) and foreign country funds ($\Delta\ FPI_t$). Again, we require that each fund has the SP, NAV, and market return data available for weeks t and t - 1, so that weekly changes in the indices and the market index are computed over the same asset base. We then define $\Delta\ DPI$ and $\Delta\ FPI$ to be

$$\Delta\ DPI_t = DPI_t - DPI_{t-1} \text{ and } \Delta\ FPI_t = FPI_t - FPI_{t-1}.$$

3.2 Nonsynchronous trading

Since a significant time difference can exist between the foreign country's market close and the New York close, reported prices and net asset values for foreign country funds are only approximately synchronous. The Appendix shows the trading hours of the main foreign markets. Clearly, the severity of this timing problem differs by country. In the extreme, the Taiwan market operates 17 hours ahead of the New York exchange.[15]

These timing differences have several implications for our tests. First, at the individual fund level, nonsynchronous SP and NAV measurements could induce negative first-order serial correlation in weekly premium changes. We discuss this issue in relation to our Table 4 results and correct for these patterns using Newey and West (1987) adjusted t-statistics in our time-series regressions (Tables 6, 7, 8, 10, and 11). Second, at the portfolio level, nonsynchronous market closings will induce positive autocorrelation in any index that aggregates returns across countries in different time zones. In particular, the global market index (FMR) and indices of changes in country fund NAVs and SPs may be affected. We discuss this problem in relation to our Table 5 results.

[15] A separate, and less important, timing problem pertains to three funds that do not report their NAVs on Fridays. Specifically, the Mexico and Taiwan funds report their NAVs as of Thursday's close, and the India Fund reports its NAV as of Wednesday's close. For these funds, the reported weekly share price is the closing price on the day the NAV is calculated. This mismatching problem reduces the correlation of premium changes for these three funds with those of other funds and adds noise to our tests. As discussed later, our results are robust to the exclusion of these funds.

Perhaps more important, this timing problem has implications for any correlation test between U.S. market returns and fund premium changes. News arriving after foreign markets are closed, but before the U.S. market closes, is incorporated into current-week U.S. returns as well as current-week premium changes. Unless controlled for, this late arriving news may induce a spurious correlation between U.S. market returns and measured fund premiums. We address this problem by including lead and lag foreign market returns and exchange rates as independent variables in our main time-series regressions (Tables 6, 7, 8). If the late arriving news affects fund fundamentals, it will be reflected in next weeks foreign market returns and exchange rates. This approach is similar to the Scholes and Williams (1977) and Dimson (1979) correction for the effect of nonsynchronous trading in the standard market model.

3.3 Country fund characteristics

Table 1 provides descriptive information on our final sample of 33 country funds as well as on the foreign premium index (FPI). This table illustrates the popularity of country fund IPOs between 1986 and 1990. Only four funds (Japan, Mexico, First Australia, and Korea) existed at the beginning of 1986, but by the end of 1990; the sample included 31 funds. Two funds (Japan and France) open-ended during the period.

We group our sample funds into three categories on the basis of foreign investment restrictions. Some funds operate in countries that have very strict foreign ownership restrictions (e.g., Korea, Brazil, and Taiwan), while others operate in relatively open markets (e.g., France, Germany, and the United Kingdom). Table 1 shows that most country funds trade at an average discount. However, some funds, such as the Korea, Spain, Taiwan, and Thailand, have average premiums of over 20 percent. Furthermore, funds in countries with greater foreign ownership restrictions tend to have higher premiums. The Korea fund, in particular, averaged a premium of 70 percent over our sample period. The positive average premiums dominated the index average, which has an average premium of about 5 percent.

As a group, country funds tend to have a greater proportion of institutional ownership than domestic funds, At the end of 1990, institutional ownership in country funds averaged over 11 percent, as compared to 6 percent for domestic funds. In general, funds in countries with more stringent foreign ownership restrictions tend to have higher institutional ownership, suggesting that some institutional investors use these funds as a global diversification vehicle [Bailey and Lim (1992)].

Table 1
Characteristics of closed-end country fund sample

Fund Name	IPO month	Number of obs.	Market value (US$Mil)	Invest. restriction code	Inst. ownership (%)	Mean weekly premium	Std. dev. of weekly premium
Austria	Sept. 1989	52	82.59	1	4	−2.99	27.73
Brazil	Mar. 1988	142	79.77	3	20	−23.75	20.97
Chile	Oct. 1989	63	83.31	3	31	0.95	15.52
First Australia	Dec. 1985	261	43.64	2	5	−14.44	9.44
First Iberian	Apr. 1988	141	50.46	1	1	0.23	21.80
First Philippine	Nov. 1989	52	58.37	3	12	−13.30	17.93
France	May 1986	182	103.24	1	9	−15.62	7.91
France Growth	May 1990	23	81.33	1	3	−18.88	4.82
Future Germany	Feb. 1990	43	142.26	1	11	−13.58	5.76
Germany	Jul. 1986	232	139.22	1	1	1.71	17.65
Growth Fd of Spain	Feb. 1990	43	144.29	2	6	−17.17	5.78
Helvetia-Swiss	Aug. 1987	175	95.08	1	4	−7.63	7.32
India Growth	Aug. 1988	122	55.15	3	33	−3.01	20.83
Indonesia	Feb. 1990	44	39.57	3	28	−0.63	11.45
Irish Investment	Mar. 1990	38	33.81	2	14	−20.75	6.90
Italy	Feb. 1986	252	64.93	1	13	−12.18	13.52
Jakarta Growth	Apr. 1990	37	35.06	—	—	8.53	18.45
Japan	Nov. 1963	84	515.60	2	4	−16.62	7.59
Japan OTC	Mar. 1990	42	71.26	2	1	0.74	19.74
Korea	Aug. 1984	261	257.90	3	14	70.08	32.98
Malaysia	May 1987	187	82.57	3	9	−0.31	20.68
Mexico	Jun. 1981	261	258.80	3	28	−21.25	12.92

Table 1
continued

Fund name	IPO month	Number of obs.	Market value (US$Mil)	Invest. restriction code	Inst. ownership (%)	Mean weekly premium	Std. dev. of weekly premium
Mexico Equity/Inc.	Aug. 1990	17	59.34	3	14	−15.23	7.50
New Germany	Jan. 1990	47	281.33	1	5	−5.45	16.59
Portugal	Dec. 1989	52	50.00	2	38	−4.08	16.97
ROC Taiwan	May 1989	85	193.32	3	1	−5.39	13.41
Singapore	Jul. 1990	22	43.83	1	5	−16.87	7.82
Spain	Jun. 1988	129	106.36	2	0	21.23	43.22
Taiwan	Dec. 1986	203	61.38	3	1	38.45	46.65
Thai	Feb. 1988	149	151.21	3	—	26.00	20.77
Thai Capital	May 1990	30	42.06	3	—	−10.19	9.22
Turkish Investment	Dec. 1989	56	47.41	3	17	−21.92	6.09
United Kingdom	Aug. 1987	175	36.08	1	2	−16.73	4.56
Index (FPI)	n/a	260	n/a	n/a	n/a	5.37	14.20

The 33 funds listed above represent all country funds traded in the United States over the period January 2, 1986, through December 28, 1990. Market values and percentage institutional ownership are reported as of the last trading date in the period covered, which is December 28, 1990, except for the France Fund (open-ended on December 9, 1989) and the Japan Fund (open-ended on August 13, 1987). Each fund is assigned a code based on the level of restrictions on foreign ownership in its home market: Code 1—no restrictions on foreign ownership or repatriation of funds, Code 2—ownership restrictions in some strategic industries, repatriation rights may involve some registration procedures, Code 3—broad restrictions on foreign ownership or repatriations. Mean weekly premium and its standard deviation are expressed in percentages. The last row reports descriptive statistics for FPI, an equally weighted index of weekly fund premiums. Fund premiums must be available in adjacent weeks to be included in the index.

4. What Moves Country Fund Premiums?

4.1 Evidence of a systematic component in premium movements

Table 1 shows that premium levels can differ widely across funds. Funds investing in countries with broad foreign ownership restrictions (code 3) have higher mean weekly premiums than other funds (0.2 percent versus -8.5 percent). The premiums for these funds are also more volatile- a standard deviation of 18.1 percent versus 14.0 percent for other funds. While these cross-sectional differences are interesting and deserving of further study, our focus in this paper is on the time-series behavior of these premiums. In particular, we are interested in whether premiums on different funds are affected by a common factor.

Table 2 reports the correlation matrix of weekly premium levels for 13 closed-end country funds and an equally weighted premium index (FPI). In this table, we include only funds with at least 100 weekly observations in both premiums and market returns. Table 2 shows that country fund premium levels are highly correlated with each other. The pairwise correlations in this table are predominantly positive and frequently exceed 0.7. Only 7 out of 78 pairwise correlations are negative; of these, only 3 are reliably negative at the 5 percent level.

Figure 1 depicts the premium levels for these 13 funds, observed at 10-week intervals throughout the study period. This graph shows that, while premiums vary widely across individual country funds, a common component does exist. For example, the Spain Funds premium increased considerably between weeks 180 and 220 (around October 1989 to March 1990) before returning to more common levels. However, despite this widely publicized phenomenon, the Spain Fund's premium levels over the study period still exhibit a strong comovement with the premium levels of other funds.

Table 3 reports the pairwise correlation of changes in weekly premiums for the same 13 funds. Again, the correlations are predominantly positive; only 10 out of 78 correlations are negative (only 1 is reliably negative at the 5 percent level). These correlations imply that premium changes, as well as levels, are positively correlated. However, since we do not control for nonsynchronous market closings in this table, these results should be viewed as being only suggestive. More stringent controls for differences in market closings are introduced in later tests.

4.2 Time-series analysis of premiums

Since all of our analyses are based on time-series data, we are concerned about the time-series characteristics of the premiums and dis-

Table 2
Correlation matrix of levels of weekly premiums for country funds

Funds	Australia	France	Germany	Helvetia-Swiss	India	Italy	Korea	Malaysia	Mexico	Spain	Taiwan	Thailand	U.K.	Index (FPI)
Australia	1.00 (261)	0.18** (182)	0.74*** (232)	0.65*** (175)	0.70*** (122)	0.73*** (252)	−0.19*** (261)	0.54*** (187)	0.24*** (261)	0.57*** (129)	0.05 (203)	0.48*** (149)	0.48*** (175)	0.43*** (260)
France		1.00 (182)	0.16** (177)	0.37*** (120)	0.69*** (67)	0.48*** (182)	0.48*** (182)	0.16* (132)	0.47*** (182)	0.59*** (74)	−0.27*** (148)	0.10 (94)	0.52*** (120)	0.38*** (182)
Germany			1.00 (232)	0.79*** (175)	0.72*** (122)	0.74*** (232)	−0.04 (232)	0.74*** (187)	0.55*** (232)	0.75*** (129)	0.02 (203)	0.47*** (149)	0.59*** (175)	0.56*** (232)
Helvetia-Swiss				1.00 (175)	0.81*** (122)	0.80*** (175)	0.05 (175)	0.80*** (175)	0.52*** (175)	0.75*** (129)	0.20*** (175)	0.51*** (149)	0.64*** (175)	0.72*** (175)
India					1.00 (122)	0.74*** (122)	0.15 (122)	0.84*** (122)	0.70*** (122)	0.77*** (122)	0.18** (122)	0.44*** (122)	0.66*** (122)	0.77*** (122)
Italy						1.00 (252)	0.11* (252)	0.72*** (187)	0.36*** (252)	0.75*** (129)	0.02 (203)	0.51*** (149)	0.66*** (175)	0.66*** (252)
Korea							1.00 (261)	0.28*** (187)	−0.04 (261)	0.34*** (129)	0.42*** (203)	0.46*** (149)	−0.08 (175)	0.64*** (260)
Malaysia								1.00 (187)	0.33*** (187)	0.75*** (129)	0.31*** (187)	0.41*** (149)	0.62*** (175)	0.78*** (187)
Mexico									1.00 (261)	0.47*** (129)	−0.23*** (203)	0.15* (149)	0.47*** (175)	0.16** (260)
Spain										1.00 (129)	0.10 (129)	0.65*** (129)	0.54*** (129)	0.88*** (129)
Taiwan											1.00 (203)	0.47*** (149)	−0.13* (175)	0.59*** (203)
Thailand												1.00 (149)	0.11 (149)	0.82*** (149)
U.K.													1.00 (175)	0.43*** (175)

Table values represent the pairwise Pearson correlation coefficient for levels of weekly premiums of country funds. All country funds with a market index return available and at least 100 weekly observations are included. The sample period is 1/2/86 to 12/28/90. The number of weekly observations for each pairwise correlation is in parentheses. (***, **, *) denote two-tailed significance at the 1 percent, 5 percent, and 10 percent levels, respectively. Fund premiums are defined as the ratio of fund price to NAV minus one. The fund index (FPI) is an equally weighted premium index that is comprised of from 4 to 29 funds. Fund premiums must be available in adjacent weeks to be included in the index.

Table 3
Correlation matrix of changes in weekly premiums for country funds

Funds	Australia	France	Germany	Helvetia-Swiss	India	Italy	Korea	Malaysia	Mexico	Spain	Taiwan	Thailand	U.K.	Index (ΔFPI)
Australia	1.00	0.04	0.25***	0.19**	0.16*	0.32***	0.09	0.19***	0.06	0.07	0.06	0.16*	0.30***	0.41***
	(260)	(181)	(231)	(174)	(121)	(251)	(260)	(186)	(260)	(128)	(202)	(148)	(174)	(260)
France		1.00	−0.14*	−0.01	0.07	0.07	0.45***	0.19**	−0.05	−0.08	0.14*	−0.23**	0.09	0.34***
		(181)	(176)	(119)	(66)	(181)	(181)	(131)	(181)	(73)	(147)	(93)	(119)	(181)
Germany			1.00	0.44***	0.18**	0.13**	0.06	0.28***	0.13*	0.47***	0.09	0.30***	0.26***	0.53***
			(231)	(174)	(121)	(231)	(231)	(186)	(231)	(128)	(202)	(148)	(174)	(231)
Helvetia-Swiss				1.00	0.25***	0.32***	−0.03	0.02	0.04	0.26***	0.03	0.16**	0.26***	0.39***
				(174)	(121)	(174)	(174)	(174)	(174)	(128)	(174)	(148)	(174)	(174)
India					1.00	0.19**	−0.03	0.18**	0.25***	0.18*	0.15*	−0.01	0.22**	0.35***
					(121)	(121)	(121)	(121)	(121)	(121)	(121)	(121)	(121)	(121)
Italy						1.00	−0.06	0.06	0.24***	0.10	0.17**	0.00	0.19**	0.39***
						(251)	(251)	(186)	(251)	(128)	(202)	(148)	(174)	(251)
Korea							1.00	0.25***	0.07	0.19**	0.34***	0.05	0.20***	0.62***
							(260)	(186)	(260)	(128)	(202)	(148)	(174)	(260)
Malaysia								1.00	0.15**	0.23***	0.25***	0.46***	0.12	0.57***
								(186)	(186)	(128)	(186)	(148)	(174)	(186)
Mexico									1.00	−0.06	0.16**	0.00	0.16**	0.14**
									(260)	(128)	(202)	(148)	(174)	(260)
Spain										1.00	0.03	0.27***	0.19**	0.64***
										(128)	(128)	(128)	(128)	(128)
Taiwan											1.00	0.13	0.24***	0.62***
											(202)	(148)	(174)	(202)
Thailand												1.00	0.04	0.54***
												(148)	(148)	(148)
U.K.													1.00	0.42***
													(174)	(174)

Table values represent the pairwise Pearson correlation coefficient for changes in the weekly premiums of country funds. All country funds with a market index return available and at least 100 weekly observations are included. The sample period is 1/2/86 to 12/28/90. The number of weekly observations for each pairwise correlation is in parentheses. (***, **, *) denote two-tailed significance at the 1 percent, 5 percent, and 10 percent levels, respectively. Fund premiums are defined as the ratio of fund price to NAV minus one. The last column (ΔFPI) is the weekly change in an equally weighted premium index that is comprised of from 4 to 29 funds. Fund premiums must be available in adjacent weeks to be included in the index.

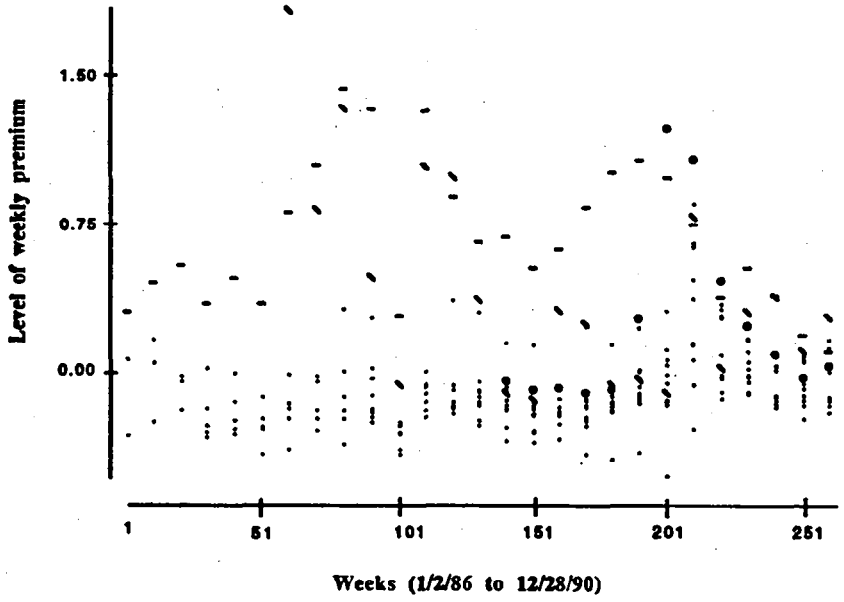

Figure 1
This graph depicts the weekly premiums on closed-end country funds during the period 1/2/86 to 12/28/90 (261 weeks), observed at 10-week intervals. All 14 country funds with 100 or more observations are included. A value of 1.00 on the vertical axis represents a 100% premium over net asset value. The three funds with the highest and most volatile premiums are separately marked. Taiwan fund; - Korea fund; o Spain Fund.

counts. For each country fund weekly premium time series, we conducted full stationarity and ARIMA model specification tests. Table 4 presents summary statistics for weekly changes in fund premiums, stock prices, and NAVs on 13 funds with at least 100 observations. We find that, for most funds, an ARI(1, 1) model with a negative first-order autocorrelation coefficient captures the time-series structure of premiums. In subsequent tests, we accommodate these time-series patterns by employing a Newey-West (1987) adjustment.

4.3 Comovement of premium indices

Table 5 presents summary statistics for the weekly market returns and premium indices used in our tests. The U.S. market return (USMR) is the return on a value-weighted portfolio of all NYSE and AMEX firms. FMR is the foreigncurrency denominated return on an equally weighted portfolio of foreign market indices. The Appendix lists the 13 country indices in the FMR that have 100 or more weekly observations. A country enters the FMR index only in the weeks that its associated fund premium is included in the FPI.

Table 4
Summary statistics for changes in fund premiums, stock prices, and NAVs

Funds	No. of obs.	Premium changes Mean	St. dev.	Rho	Price changes Mean	Std. dev.	Rho	NAV changes Mean	Std. Dev.	Rho
Australia	260	−0.001	0.047	−0.288	−0.010	0.534	−0.002	−0.002	0.421	0.384
France	181	0.002	0.038	−0.165	0.019	0.435	0.138	0.001	0.380	0.129
Germany	231	0.000	0.087	−0.343	0.006	0.910	−0.229	0.008	0.450	−0.155
Helvetia-Swiss	174	−0.001	0.040	−0.288	−0.012	0.528	−0.088	−0.004	0.349	−0.054
India	121	−0.001	0.065	−0.124	0.009	0.759	−0.008	0.023	0.571	−0.079
Italy	251	−0.001	0.058	−0.127	−0.008	0.713	−0.016	0.001	0.578	−0.279
Korea	260	−0.001	0.126	−0.228	−0.020	3.998	−0.004	−0.009	1.787	−0.039
Malaysia	186	−0.001	0.077	−0.197	−0.005	0.977	−0.058	0.007	0.396	0.051
Mexico	260	0.000	0.051	−0.126	0.039	0.601	0.054	0.047	0.556	0.284
Spain	128	0.000	0.118	−0.179	−0.003	1.719	−0.182	−0.002	0.385	0.048
Taiwan	202	−0.006	0.144	−0.081	0.011	2.792	0.044	0.022	2.093	0.025
Thailand	148	−0.004	0.102	−0.341	−0.031	1.353	−0.158	0.014	0.849	−0.217
U.K.	174	−0.001	0.033	−0.387	−0.010	0.448	−0.233	−0.005	0.297	0.156
Index (ΔFPI)	260	−0.002	0.041	−0.052	0.017	0.800	0.115	0.026	0.326	0.173

Table values represent summary statistics for weekly U.S. dollar-denominated closed-end fund stock prices, net asset values (NAV), and premiums. Premiums are defined as the ratio of fund price to NAV minus one. The sample period is 1/2/86 to 12/28/90. The last row (ΔFPI) represents weekly changes in an equally weighted premium index that is composed of from 4 to 29 funds. To ensure a common membership base when computing weekly changes, a fund's premium must be available in adjacent weeks to be included in the index. Std. dev. are standard deviation estimates, and Rhos are first-order autocorrelation estimates.

Table 5

Panel A: Summary statistics for closed-end fund premium indices

Index	No. of obs.	Mean	Std. dev.	Rho
USMR	261	0.002	0.022	0.038
FMR	260	0.005	0.022	0.213
ΔDPI	259	0.000	0.012	−0.118
ΔFPI	260	0.002	0.041	−0.052
ΔSP	260	0.018	0.800	0.115
ΔNAV	260	0.026	0.326	0.173

Table values represent summary statistics for weekly U.S. value-weighted market returns (USMR), an equally weighted foreign return index (FMR), weekly changes of the equally weighted index of domestic fund premiums (ΔDPI), weekly changes of the equally weighted index of country fund prices (ΔSP), weekly changes of the equally weighted index of country net asset values (ΔNAV), and weekly changes in the index of country fund premiums (ΔFPI). Fund premiums are defined as the ratio of fund price to NAV minus one. Std. dev. are standard deviation estimates, and Rhos are first-order autocorrelation estimates.

Panel B: Correlation of country fund premium index with other indices

Index	USMR	FMR	ΔDPI	ΔFPI	ΔNAV	ΔSP
USMR	1.00***	0.41***	−0.18***	0.38***	0.32***	0.49***
	(261)	(260)	(259)	(260)	(260)	(260)
FMR		1.00***	0.00	0.19***	0.69***	0.49***
		(260)	(258)	(260)	(260)	(260)
ΔDPI			1.00***	0.03	−0.04	−0.03
			(259)	(258)	(258)	(258)
ΔFPI				1.00***	−0.03	0.81***
				(260)	(260)	(260)
ΔNAV					1.00***	0.47***
					(260)	(260)
ΔSP						1.00***
						(260)

Table values represent pairwise Pearson correlation coefficients. The number of weekly observations for each fund is in parenthesis. (***, **, *) denote two-tailed significance at the 1 percent, 5 percent, and 10 percent levels, respectively.

Interestingly, foreign fund premium changes (Δ FPI) tend to be more volatile than changes of domestic premiums (Δ DPI). Moreover, the weekly standard deviation of fund stock price changes (Δ SP) is more than twice that of the fund net asset value changes (Δ NAV). Apparently country fund prices are more volatile than either domestic funds or their own NAVs.

Consistent with Harvey (1993), panel A shows that the FMR index has a strong positive autocorrelation component. This finding may reflect, in part, differences in the timing of market closings across countries (since individual market returns are being measured over different trading periods). A similar pattern is observed in both the Δ SP and Δ NAV indices. Panel B shows that foreign (FMR) and U.S. market (USMR) returns are positively correlated, and that both are

correlated with country fund stock prices. This finding suggests that the U.S. and global markets are, to some degree, integrated.

In panel B, we also see that the correlation between Δ NAV and Δ FPI is insignificant while the correlation between Δ SP and Δ FPI is highly significant (0.81). These correlations suggest that the weekly changes in the foreign premium index are due to movements in the funds' stock prices rather than their NAVs. In the next subsection, we further examine the return-generating process underlying these funds by separating fund premium changes into their SP and NAV components.

Finally, we see in panel B that changes in the foreign premium index (Δ FPI) are not correlated with changes in the domestic fund index (Δ DPI); however, Δ FPI is correlated with USMR. Lee et al. (1991) report that domestic fund premium changes are not correlated with U.S. market returns. In contrast, the foreign country premium index is *positively* correlated with the U.S. market return. In the next subsection, we examine whether this comovement is due to nonsynchronous trading problems or the time-varying demand of U.S. investors.

4.4 Decomposition of country fund premiums

In this subsection, we "parse" the changes in a closedend country fund premium into changes in stock prices (Δ SP) and changes in net asset value (Δ NAV), and assess the sensitivity of each component to foreign and U.S. market movements. If changes in the country fund premiums are due to differential investor demands in the two markets, we should observe a stronger correlation between the U.S. market returns and fund SP, compared to the correlation between U.S. market returns and returns on NAVs.

Table 6 reports the results of a time-series regression of the weekly changes in the fund premiums of individual country funds (dependent variable), on exchange rate changes, foreign market returns, the domestic premium index, and U.S. market returns. To control for nonsynchronous trading, the 1-week lead and lag foreign market returns and exchange rate changes are included in the regression. Estimations are by ordinary least squares regressions with Newey-West (1987) adjusted t-statistics. Our choice of six Newey-West lags encompasses autocorrelation orders slightly beyond the monthly horizon. All country funds with over 100 observations are included. The most striking result in Table 6 is the coefficient on USMR. For all 13 funds, this coefficient is positive, significantly so in 9 cases. This finding suggests that premium changes are correlated with U.S. returns after controlling for foreign market returns and exchange rate changes.[16]

[16] One-week leads and lags should be sufficient to correct for nonsynchronous market closings.

Table 6
Time-series relation of changes in country fund premiums to market returns, changes in domestic fund premiums, and exchange rates

Funds	α	β_{t+1}	β_t	β_{t-1}	γ_{t+1}	γ_t	γ_{t-1}	ρ	ν	Adj. R^2
Index (FPI)	−0.003	0.127	0.030	0.027	0.040	0.053	0.557	0.469	0.621	0.206
t-stat	−1.30	1.60	0.28	0.38	0.20	0.21	2.64	2.44	4.44***	
Australia	−0.001	0.015	−0.041	−0.140	−0.062	−0.535	0.498	0.590	0.414	0.096
t-stat	−0.41	0.14	−0.40	−0.86	−0.45	−2.30	1.63	2.26	2.52**	
France	0.000	−0.112	0.001	0.120	−0.111	−0.105	−0.013	0.395	0.340	0.042
t-stat	0.14	−1.02	0.01	1.47	−0.63	−0.71	−0.09	2.64	1.66*	
Germany	−0.001	0.096	−0.140	−0.170	0.020	0.177	0.195	0.682	0.632	−0.003
t-stat	−0.26	0.72	−0.54	−0.86	0.05	0.53	0.80	1.63	1.14	
Helvetia-Swiss	−0.001	0.056	−0.207	0.188	−0.030	−0.229	−0.004	0.568	0.509	0.075
t-stat	−0.41	0.52	−1.95	1.63	−0.18	−1.21	−0.03	1.97	3.87***	
India	0.001	−0.230	−0.264	−0.011	0.910	−0.728	−0.270	−0.863	1.184	0.127
t-stat	0.13	−1.52	−1.69	−0.06	2.12	−1.20	−0.64	−1.38	3.73***	
Italy	−0.001	0.022	−0.061	0.242	0.075	0.052	−0.432	0.512	0.464	0.038
t-stat	−0.36	0.18	−0.53	3.01	0.38	0.25	−2.17	1.79	2.79***	
Korea	−0.005	0.485	−0.312	0.427	2.587	−2.812	−2.360	−0.318	1.547	0.102
t-stat	−1.05	1.82	−0.89	1.65	1.24	−1.72	−1.20	−0.51	3.57***	
Malaysia	−0.003	0.538	−0.180	0.048	1.022	−0.419	−1.358	0.769	0.506	0.092
t-stat	−0.65	3.48	−0.91	0.29	0.89	−0.49	−1.39	1.55	1.26	
Mexico	0.005	−0.188	0.131	−0.036	−0.057	0.327	0.168	0.158	0.224	0.056
t-stat	1.30	−2.53	2.36	−0.50	−0.17	1.20	1.44	0.54	1.17	
Spain	−0.012	−0.073	−0.997	0.047	1.190	−0.422	0.364	−0.425	3.204	0.143
t-stat	−1.35	−0.22	−1.67	0.19	1.79	−0.57	0.59	−0.59	2.15**	
Taiwan	−0.002	0.104	−0.081	−0.264	0.530	−1.881	−0.872	0.848	1.060	0.031
t-stat	−0.22	1.02	−0.57	−2.71	0.46	−2.52	−0.95	0.74	2.60**	
Thailand	−0.004	0.178	−0.297	0.055	2.146	−0.813	2.715	−0.082	0.436	0.021
t-stat	−0.66	2.13	−2.64	0.40	0.75	−0.45	1.57	−0.14	0.82	
U.K.	0.000	−0.256	0.235	−0.122	0.262	−0.147	−0.020	0.362	0.475	0.257
t-stat	0.09	−2.32	3.15	−1.89	1.60	−0.74	−0.17	1.92	3.82***	

Weekly analysis of the time-series relations between changes in country fund premiums (ΔPD, dependent variable), foreign equity market returns in foreign currency (FMR), exchange rate changes (Δe), U.S. value-weighted market returns (USMR), and a equal-weighted index of premium changes on domestic closed-end funds (ΔDPI). Three weeks of foreign market returns and associated exchange rate changes are included to correct for nonsynchronous trading problems. All estimation is by OLS and Newey-West (1987) adjusted t-statistics with six lags are reported. For the USMR coefficients, (***, **, *) denote two-tailed significance at the 1 percent, 5 percent, and 10 percent levels, respectively.

$$\Delta PD_t = \alpha + \sum_{i=-1}^{+1} \beta_i FMR_{t+i} + \sum_{i=-1}^{+1} \gamma_i e_{t+i} + \rho \Delta DPI_t + \nu USMR_t + \varepsilon_t$$

Table 7
Time-series relation of changes in country fund net asset values to market returns, changes in domestic fund premiums, and exchange rates

Funds	α	β_{t+1}	β_t	β_{t-1}	γ_{t+1}	γ_t	γ_{t-1}	ρ	ν	Adj. R^2
Index (FPI)	−0.022	−0.211	10.384	0.893	0.881	5.867	−2.973	−1.531	0.234	0.494
t-stat	−1.69	−0.24	13.98	2.17	0.42	2.18	−1.91	−0.94	0.29	
Australia	−0.033	0.945	9.175	2.150	1.633	8.123	0.356	−1.223	0.589	0.758
t-stat	−2.54	2.36	6.22	4.51	1.74	7.02	0.22	−1.13	0.74	
France	−0.041	0.037	5.467	3.591	0.891	8.477	5.293	1.726	1.455	0.414
t-stat	−2.62	0.05	2.74	5.63	0.71	7.74	3.06	1.12	0.87	
Germany	0.001	0.178	10.655	1.546	0.865	4.315	−0.126	−0.467	−2.936	0.413
t-stat	0.04	0.30	7.94	1.84	0.80	3.03	−0.13	−0.27	−1.00	
Helvetia-Swiss	−0.007	−0.993	10.825	0.350	1.324	10.156	0.901	−1.474	0.517	0.622
t-stat	−0.85	−2.01	15.37	0.67	1.34	9.00	1.37	−0.89	0.84	
India	−0.016	−0.439	8.641	3.895	2.855	3.521	0.297	3.984	−4.008	0.297
Swiss	−0.44	−0.40	5.90	2.57	0.84	0.92	0.09	1.05	−1.46	
Italy	−0.014	−0.569	7.464	1.173	−0.511	6.417	3.283	−1.199	0.156	0.168
t-stat	−0.90	−0.65	14.14	1.54	−0.31	3.40	2.93	−0.46	0.19	
Korea	−0.066	−7.262	17.209	0.043	−7.868	−14.102	−3.254	1.867	4.282	0.078
t-stat	−1.47	−1.09	5.42	0.02	−0.55	−0.50	−0.22	0.35	1.21	
Malaysia	−0.001	−0.111	9.303	−0.155	0.419	15.726	−1.434	1.590	0.880	0.831
t-stat	−0.06	−0.24	13.45	−0.46	0.23	6.02	−0.57	1.58	1.26	
Mexico	−0.061	1.873	5.222	1.038	5.740	−0.038	0.461	−0.313	1.629	0.488
t-stat	−1.32	2.41	4.86	1.42	2.57	−0.01	0.30	−0.14	0.98	
Spain	−0.006	0.027	12.537	0.464	−0.103	11.329	2.043	3.226	0.329	0.736
t-stat	−0.42	0.08	10.45	0.89	−0.07	5.13	1.30	2.83	0.29	
Taiwan	−0.157	−2.787	13.186	4.845	11.931	18.567	−0.140	−1.313	−2.328	0.260
t-stat	−1.30	−1.47	5.19	2.70	1.48	1.45	−0.01	−0.07	−0.41	
Thailand	−0.034	−0.963	14.098	−0.004	−8.712	12.166	−2.943	2.114	2.559	0.809
t-stat	−1.44	−1.83	10.31	−0.01	−1.74	1.58	−0.40	0.74	1.48	
U.K.	−0.017	0.311	9.800	−0.118	−0.207	7.902	1.181	−0.918	−0.374	0.801
t-stat	−1.80	0.95	20.60	−0.29	−0.41	7.57	2.09	−0.85	−0.77	

Weekly analysis of the time-series relations between changes in country fund net asset values (ΔNAV) (dependent variable), foreign equity market returns in foreign currency (FMR), exchange rate changes (Δe), U.S. value-weighted market returns (USMR), and a equal-weighted index of premium changes on domestic closed-end funds (ΔDPI). Three weeks of foreign market returns and associated exchange rate changes are included to correct for nonsynchronous trading problems. All esimtation is by OLS and Newey-West (1987) adjusted t-statistics with six lags are reported. Note that none of the USMR coefficients are significant at the 10 percent level.

$$\Delta NAV_t = \alpha + \sum_{t=-1}^{+1} \beta_t FMR_{t+t} + \sum_{t=-1}^{+1} \gamma_t e_{t+t} + \rho \Delta DPI_t + \nu USMR_t + \varepsilon_t$$

Table 7 presents the same regressions with Δ NAV as the dependent variable. We find that foreign market returns and exchange rate changes account for much of the week-to-week variation in the NAV of foreign country funds. The U.S. market return, on the other hand, has little explanatory power for Δ NAV. Except for Korea, the R^2 are all quite high, suggesting good fits. Since most of these country funds hold the major equity stocks in their home countries, this result is not surprising. The domestic premium index (Δ DPI) is not a significant explanatory variable for any of the country fund NAV changes.

Table 8 reports results for a similar regression, with changes in fund stock prices (Δ SP) as the dependent variable. The most striking difference between Tables 7 and 8 is that the U.S. market return, which did not explain NAV changes, does explain the stock price changes of these funds. For all 13 funds, the coefficient on USMR is positive (significant at the 1% level in 9 cases). Thus, when U.S. market returns are positive, stock prices of country funds increase relative to their NAVs. When we control for foreign fundamentals, changes in country fund stock prices are positively correlated with U.S. market returns, while changes in their NAVs are not.

Note that the coefficient on the lead foreign market return (β_{t+1}) is positive for fund share prices but not for NAVs (row 1 of Tables 7 and 8). This is consistent with late-arriving news being captured in next week's foreign market returns. However, at the individual fund level, only Malaysia and Thailand have significant positive coefficients for the stock price regression (Table 8). Many funds with the largest timing problems (e.g., India, Taiwan, Korea, and Australia) do not have a significant β_{t+1} coefficient, suggesting that nonsynchronous trading effects are not pervasive.

In sum, Tables 6, 7, and 8 show that the comovement of country fund premium changes with the U.S. market returns is due to the comovement of these funds' stock prices with U.S. market returns. Consistent with the investor sentiment hypothesis, when U.S. market prices increase, country fund SPs also increase relative to foreign asset fundamentals.

5. Fund Premiums and Cross-sectional Returns

5.1 Size deciles

Lee et al. (1991) show that changes in domestic closedend fund premiums co-vary with cross-sectional excess returns in the United States.

However, to be absolutely sure we tested the index regressions in Tables 6, 7, and 8 using 2-week leads and lags, and the key results on U.S. market returns are unaffected. We also correct for first-order autocorrelation using the Cochrane-Orcutt approach instead of the Newey-West adjustment and again the USMR results remain qualitatively the same.

Table 8
Time-series relation of changes in country fund stock prices to market returns, changes in domestic fund premiums, and exchange rates

Funds	α	β_{t+1}	β_t	β_{t-1}	γ_{t+1}	γ_t	γ_{t-1}	ρ	ν	Adj. R^2
Index (FPI)	−0.082	3.472	12.994	1.477	−0.919	5.370	8.213	1.673	10.920	0.349
t-stat	−1.89	2.26	5.29	1.24	−0.20	0.97	1.92	0.58	4.57***	
Australia	−0.036	1.574	6.094	0.326	0.621	1.772	4.979	4.878	4.858	0.277
t-stat	−1.55	1.30	7.14	0.19	0.38	0.84	2.03	2.08	3.11***	
France	−0.029	−1.361	3.796	4.664	−1.284	5.848	4.272	6.193	5.863	0.306
t-stat	−1.27	−1.22	4.24	4.64	−0.69	3.35	2.75	3.56	2.42**	
Germany	−0.015	1.175	10.319	−0.604	1.217	8.011	1.898	5.387	3.039	0.102
t-stat	−0.26	0.76	3.16	−0.33	0.28	2.26	0.72	1.48	0.67	
Helvetia-Swiss	−0.017	0.042	7.552	2.426	0.839	6.551	0.849	5.625	6.780	0.308
t-stat	−0.78	0.03	5.16	1.87	0.46	2.98	0.59	1.60	4.11***	
India	−0.015	−3.896	4.315	3.190	14.443	−7.789	−2.912	−8.290	14.757	0.122
t-stat	−0.23	−2.08	1.66	1.94	2.31	−0.88	−0.50	−1.08	3.65***	
Italy	−0.026	−0.003	5.686	4.093	0.136	7.528	−1.948	5.269	5.769	0.155
t-stat	−0.70	0.00	3.98	4.10	0.05	2.90	−0.79	1.36	2.44**	
Korea	−0.276	−0.186	27.785	10.382	21.760	−80.247	−44.941	1.178	47.213	0.122
t-stat	−1.71	−0.02	3.20	1.46	0.70	−1.50	−1.26	0.07	3.05***	
Malaysia	−0.027	6.394	7.204	−0.630	15.892	11.995	−19.076	7.399	5.110	0.213
t-stat	−0.53	3.35	2.66	−0.34	1.26	1.31	−1.70	1.24	1.03	
Mexico	−0.012	0.270	4.854	−0.043	4.207	1.660	0.505	2.494	4.820	0.304
t-stat	−0.27	0.29	4.64	−0.07	3.24	0.75	0.30	0.55	1.59	
Spain	−0.180	−0.679	0.164	1.946	16.778	7.579	7.962	−2.990	46.803	0.178
t-stat	−1.41	−0.15	0.02	0.55	1.69	0.70	0.93	−0.30	2.14**	
Taiwan	−0.168	0.096	11.372	−0.465	30.078	−18.974	−17.009	8.954	28.967	0.139
t-stat	−0.92	0.06	5.25	−0.22	1.05	−0.99	−0.90	0.75	2.38**	
Thailand	−0.082	2.558	9.465	1.167	34.931	−4.784	35.144	0.040	9.821	0.121
t-stat	−0.90	1.97	5.96	0.54	0.76	−0.18	1.36	0.00	1.28	
U.K.	−0.013	−2.332	10.233	−1.260	2.825	4.967	0.764	3.449	4.885	0.575
t-stat	−0.95	−2.05	13.17	−1.90	1.63	2.69	0.67	1.57	3.67***	

Weekly analysis of the time-series relations between changes in country fund stock prices (ΔSP, dependent variable), foreign equity market returns in foreign currency (FMR), exchange rate changes (Δe), U.S. value-weighted market returns (USMR), and a equal-weighted index of premium changes on domestic closed-end funds (ΔDPI). Three weeks of foreign market returns and associated exchange rate changes are included to correct for nonsynchronous trading problems. All estimation is by OLS and Newey-West (1987) adjusted t-statistics with six lags are reported. For the USMR coefficients, (***, **, *) denote two-tailed significance at the 1 percent, 5 percent, and 10 percent levels, respectively.

$$\Delta SP_t = \alpha + \sum_{t=-1}^{+1} \beta_t FMR_{t+t} + \sum_{t=-1}^{+1} \gamma_t e_{t+t} + \rho \Delta DPI_t + \nu USMR_t + \varepsilon_t$$

In particular, small firms earn positive (negative) excess returns when domestic fund premiums are high (low). This finding is consistent with their small-trader hypothesis. It is also consistent with the clientele-based return model we presented earlier.

Similarly, country fund premiums capture differences between the time-varying demand of U.S. and foreign investors. When U.S. investor demand increases (i.e., U.S. investors become optimistic) relative to investors in other markets, country fund SPs are bid up relative to their NAVs. If this risk affects many assets, it will not be diversifiable and should be priced in equilibrium. As suggested by Equation (6), different U.S. assets will have different sensitivities (factor loadings) to this risk measure.

Following Lee et al. (1991), we examine the differential sensitivity of size-decile returns to changes in the country fund premium index. Historically, small U.S. firms have been of less interest to foreign investors. Thus, we hypothesize that when country fund premiums are high (low), small firms will earn positive (negative) excess returns. To test this hypothesis, we regress weekly returns on 10 size-decile portfolios of NYSE and AMEX firms on the U.S. market return and changes in the foreign country fund premium index. To ensure that we do not rediscover the same effect as in Lee et al., we also include the domestic fund premium index (Δ DPI) as a regressor.

Results in Table 9 show that changes in both domestic and foreign fund premiums are significant in explaining cross-sectional returns in the U.S. market. As in Lee et al. (1991), we find a positive relation between domestic fund premium changes and small-firm excess returns.

In addition, this table shows that small firms earn positive (negative) excess returns when country fund premiums increase (decrease). Although the two premium indices are not correlated, they both help to "explain" cross-sectional size-decile returns.[17]

5.2 U.S. institutional ownership

Chopra et al. (1993a) document a relation between institutional ownership levels and domestic fund premiums. Since the domestic premium index contrasts individual and institutional clienteles in the United States, this finding supports their sentiment hypothesis. In Table 10, we extend their results using both a domestic and a foreign

[17] We also performed the same regression including a composite index of foreign market returns (FMR) to control for foreign market fundamental risk that might differentially affect U.S. firms. The results (not reported) show that small-firm returns are positively correlated with changes in both fund premium indices even after controlling for U.S. and foreign market returns. Instead of two market returns, we also performed these regressions with a single global market factor and found similar results.

Table 9
Weekly time-series relations between returns on size-decile portfolios, the U.S. market return, changes in domestic fund premiums, and changes in country fund premiums

Size	Intercept	t-stat.	ΔDPI	t-stat.	USMR	t-stat.	ΔFPI	t-stat.	Adj R^2
1 (small)	0.000	−0.31	0.324	2.13	0.600	5.55	0.131	3.10	0.445
2	−0.002	−1.38	0.269	3.53	0.682	8.16	0.121	3.41	0.607
3	−0.001	−1.35	0.276	4.29	0.758	9.12	0.103	3.42	0.669
4	−0.001	−1.54	0.269	4.81	0.795	10.18	0.088	3.50	0.722
5	−0.001	−0.96	0.180	3.93	0.830	14.51	0.075	3.18	0.757
6	0.000	−0.55	0.175	4.28	0.867	12.73	0.064	2.59	0.789
7	0.000	−0.30	0.160	4.20	0.922	20.52	0.048	2.46	0.855
8	0.000	−0.08	0.067	2.06	0.986	24.80	0.025	1.58	0.911
9	0.000	−0.46	0.010	0.42	1.021	58.72	0.001	0.07	0.952
10 (large)	0.000	0.93	−0.036	−2.29	1.059	52.23	−0.013	−2.21	0.984

Table values represent the time-series relations between weekly returns on size-decile portfolios (dependent variables), the weekly value-weighted U.S. market return (USMR), changes in the weekly premium on an equally weighted portfolio of domestic closed-end funds (ΔDPI), and changes in the weekly premium on an equally weighted portfolio of foreign country funds (ΔFPI). At the beginning of each year, all NYSE firms are ranked by market capitalization and divided into 10 size deciles, with Decile 1 (10) consisting of the smallest (largest) firms. Portfolios are rebalanced annually. Results are based on 5 years (261 weeks) of data: 1/2/86 to 12/28/90. All estimation is by OLS and Newey-West (1987) adjusted t-statistics with six lags are reported.

fund premium index. To construct this table, we collected beginning-of-the-year institutional ownership data from the *Spectrum* database for all NYSE and AMEX firms. We then formed three subportfolios, by percent of institutional ownership (high, medium, and low), within each size decile. Memberships in these 30 portfolios are reformulated at the beginning of each year. The number of firma in each subportfolio varies between 64 and 67.

Table 10 reports a regression of the subportfolio returns on U.S. market returns (USMR), changes in the foreign fund premium index (Δ FPI), and changes in the equally weighted domestic fund premium index (Δ DPI). Our results for the domestic fund index are similar to those of Chopra et al. (1993a): low institutional ownership firms have a more positive factor loading on Δ DPI. A cross-equation F-test of the null hypothesis that the Δ DPI coefficient is the same for low and high institutional firms is rejected at the 10 percent level for three size deciles. An aggregate test across all size deciles is rejected at less than 1 percent.[18] For our sample, domestic fund premium changes are correlated with institutional ownership even after controlling for size.

More importantly, Table 10 shows that, unlike the domestic fund index, the country fund index is not a simple function of U.S. institutional ownership. Interestingly, for smaller-sized firms (deciles 1 through 6), the coefficient on Δ FPI also varies negatively with in-

[18] We thank Rex Thompson for suggesting the test statistic for the aggregate F-test. Our procedure is very similar to a test used in Schipper and Thompson (1985).

Table 10
Weekly time-series relations between size-institutional ownership portfolio returns, market returns, and changes in closed-end fund premiums

Size	Inst.	Intercept	t-stat.	ΔDPI	t-stat.	USMR	t-stat.	ΔFPI	t-stat.	Adj. R^2	Mean institu. ownership (%)
1	L	0.001	0.50	0.306	1.35	0.575	5.63	0.182	3.84	0.352	0.99
1	M	−0.001	−0.77	0.347	2.62	0.640	5.37	0.088	1.78	0.348	5.05
1	H	−0.001	−0.68	0.317	2.52	0.585	4.94	0.124	2.83	0.371	16.83
2	L	−0.002	−1.74	0.281	2.93	0.597	7.30	0.147	3.71	0.492	2.73
2	M	−0.001	−0.52	0.295	3.81	0.727	8.79	0.115	3.20	0.585	8.60
2	H	−0.002	−1.54	0.232	2.70	0.722	7.68	0.102	2.81	0.548	23.64
3	L	−0.001	−1.21	0.324	3.59	0.706	6.78	0.111	3.24	0.558	3.64
3	M	−0.002	−1.43	0.257	3.27	0.756	9.95	0.111	3.88	0.623	12.21
3	H	−0.001	−1.13	0.245	3.94	0.813	10.77	0.087	2.71	0.661	30.41
4	L	−0.001	−1.30	0.312	5.15	0.674	8.72	0.104	4.09	0.637	4.82
4	M	−0.002	−1.91	0.289	4.64	0.812	12.12	0.096	3.60	0.698	16.82
4	H	−0.001	−1.20	0.206	3.06	0.898	9.44	0.065	2.30	0.681	36.06
5	L	−0.001	−1.11	0.177	2.81	0.712	16.69	0.099	3.97	0.675	6.64
5	M	−0.001	−1.05	0.182	2.70	0.846	10.99	0.063	2.21	0.701	21.73
5	H	−0.001	−0.57	0.182	3.31	0.933	14.29	0.065	2.53	0.731	42.89
6	L	0.000	−0.61	0.235	5.08	0.754	11.73	0.078	3.27	0.723	9.30
6	M	0.000	−0.37	0.174	3.30	0.884	12.05	0.058	2.15	0.753	27.76
6	H	−0.001	−0.58	0.117	2.30	0.964	13.60	0.056	2.00	0.764	50.16

Table 10
(continued)

Size	Inst.	Intercept	t-stat.	ΔDPI	t-stat.	USMR	t-stat.	ΔFPI	t-stat.	Adj. R^2	Mean institu. ownership (%)
7	L	0.000	0.12	0.191	5.35	0.724	17.16	0.034	1.77	0.766	10.80
7	M	0.000	−0.17	0.136	2.39	0.973	20.53	0.046	2.33	0.824	32.21
7	H	−0.001	−0.56	0.152	2.53	1.069	18.56	0.064	2.51	0.816	53.25
8	L	0.000	0.69	0.121	2.80	0.800	17.46	0.022	1.12	0.799	15.37
8	M	0.000	−0.41	0.067	1.44	1.037	29.57	0.018	1.50	0.907	38.36
8	H	0.000	−0.45	0.013	0.26	1.122	22.24	0.035	1.67	0.883	58.44
9	L	0.000	0.47	0.032	1.11	0.869	32.26	−0.017	−1.45	0.882	22.85
9	M	0.000	−0.21	0.021	0.72	1.053	47.47	0.011	0.78	0.925	45.16
9	H	−0.001	−0.99	−0.023	−0.53	1.142	45.34	0.009	0.50	0.917	62.21
10	L	0.001	1.61	−0.014	−0.44	0.942	23.80	−0.033	−2.75	0.936	28.42
10	M	0.000	1.43	−0.049	−2.20	1.099	49.21	−0.019	−2.57	0.965	49.46
10	H	0.000	−1.28	−0.044	−1.39	1.136	72.92	0.012	1.25	0.954	66.50

Table values represent weekly regression of equally weighted "size-institutional holding" portfolio returns on the market return (USMR), equally weighted changes in the weekly premium on closed-end country funds (ΔFPI), and closed-end domestic fund (ΔEWDPI). All NYSE and AMEX firms with institutional ownership data from the Spectrum database are included. At the beginning of each year, firms are size ranked and divided into low (L), medium (M), and high (H) institutional ownership portfolios within each size decile. Portfolios are rebalanced annually. The average number of firms for each portfolio is 64 to 67. Results are based on 5 years (261 weeks) of data: 1/2/86 to 12/28/90. All estimation is by OLS and Newey-West (1987) adjusted t-statistics with six lags are reported.

stitutional ownership. In deciles 7 to 10, however, we observe a relation opposite to that for the domestic fund premiums. For these larger firms, relatively *higher* institutional holdings are associated with greater sensitivity to Δ FPI. We did not expect this result *ex ante* and do not attempt to interpret it here. However, we regard as significant the finding that institutional holdings are not monotonically correlated with sensitivity to the foreign fund index.

5.3 Results for individual country funds

The results of this section have been based on premium indices. However, we conduct a final test to investigate the relation between individual fund premium changes and cross-sectional U.S. market returns. For simplicity, we construct a variable that is the difference between small and large firm returns (DEC1-DEC10). We then examine the ability of changes in individual fund premiums to explain this variable over time. The results (not reported) show that, in 10 out of 13 cases, the coefficient on the fund premium variable is positive, significantly so for 6 funds. This finding shows that our earlier results do not depend critically on the composition of the foreign fund index.

6. Predicting Fund Returns

As a final test, we examine the ability of premium levels to forecast fund stock returns. If premiums on country funds reflect investor sentiment, and these sentiments mean-revert, then current premium levels should forecast returns on fund stock prices. Prior studies with domestic closed-end funds show that a hedged trading strategy of buying funds with high discounts and shorting funds with high premiums can result in abnormal profits [Thompson (1978), Anderson (1986), and Brauer (1988)]. However, the extent to which these profits are economically significant (after trading costs) is subject to interpretation. This study does not evaluate the extent to which similar trading strategies might result in exploitable profit opportunities in country funds. Our purpose is simply to assess whether premium levels are informative about subsequent NAV and SP returns.

Table 11 reports the results of time-series regressions of premium, stock price, and NAV returns on the premium levels and recent returns. We have no information about the horizon over which mean-reversion might occur, and do not pretest the data to establish best fit. However, since prior studies with domestic funds have used monthly returns, we mimic the approach of these studies by aggregating our weekly returns over 4-week intervals.

All estimations we conduct are at the portfolio level, with the cumulative returns on an equally weighted portfolio of country funds as

Table 11
Country fund stock returns, NAV returns, and premium returns predictability

	β_0	β_1	β_2	Adj. R^2
Panel A: Premium returns				
	0.006	−0.133		0.075
t-stat.	0.82	−2.49**		
	−0.001		0.114	0.009
t-stat.	0.16		1.59	
	0.009	−0.171	0.235	0.121
t-stat.	1.14	−3.09***	3.10***	
Panel B: NAV returns				
	0.008	0.027		0.003
t-stat.	1.39	0.99		
	0.008		0.107	0.007
t-stat.	1.65*		2.31**	
	0.007	0.020	0.092	0.007
t-stat.	1.40	0.79	1.96*	
Panel B: Stock price returns				
	0.014	−0.106		0.024
t-stat.	1.32	−1.61		
	0.006		0.175	0.027
t-stat.	0.63		3.01***	
	0.015	−0.171	0.273	0.085
t-stat.	1.65*	−2.44**	3.67***	

Table values represent a weekly analysis of the time-series relations between the 4-week leading cumulative country fund stock returns (SP), net asset value (NAV) returns and premium returns (PD), premium levels of an equally weighted portfolio of country funds, and the associated 4-week cumulative returns for the current week and three lagging weeks. The time period covered is 1/2/86 to 12/28/90 (261 weeks). All estimation is by OLS and Newey-West (1987) adjusted t-statistics with 13 lags are reported. (***, **, *) denote two-tailed significance at the 1 percent, 5 percent, and 10 percent levels, respectively.

$$\sum_{k=1}^{4} R^{j}_{t+k,t} = \beta_0 + \beta_1 FPI_t + \beta_2 \sum_{k=1}^{4} R^{j}_{t-k+1,t} + \varepsilon_{t+1,t}, \forall j = \text{PD, SP, or NAV}.$$

our dependent variable.[19] Returns for each fund are calculated weekly based on the stock prices and NAVs reported in *Barron's* The portfolio returns are then formed by equally weighting the stock price and NAV returns across individual funds. An individual country fund's stock price returns and NAV returns enter an index when its SP, NAV, and associated market return are all available for the current and lagging weeks. The fund premium return is the difference between the stock price and NAV returns.

[19] We estimate the same regressions for each of our 13 funds. The results (not reported) support the indices findings and are available upon request.

We regress the portfolio returns on FPI (the level of the FPI at the beginning of the 4-week period) and on lagged 4-week returns. All t-statistics are corrected by the Newey-West (1987) procedure to ensure they are not inflated by time-series correlations in the premium returns. We use 13 Newey-West lags to adjust our t-statistics: 6 lags to match our previous specification and an additional 7 lags for the autocorrelation induced by temporally aggregating the returns.[20]

In panel A, the dependent variable is the return on fund premiums. The coefficient on FPI (β_1) is reliably negative, suggesting that returns on fund premiums are lower (higher) over the next 4 weeks if current premium levels are higher (lower). Panels B and C decompose this return and show that this effect arises because fund stock returns tend to be lower (higher) in the future. The b_1 coefficient on NAV returns is positive and insignificant. This suggests that higher premium levels are associated with lower short-term returns on fund stock prices but not NAVs.

Another interesting result is the coefficient on the lagged dependent variable (β_2). Jegadeesh (1991) shows that this coefficient captures the mean-reversion component in the time series. Our regressions show that there is a significant positive serial correlation in fund premium returns at the monthly interval. Panels B and C show that while the positive serial correlation exists for NAV returns, it is even stronger for SP returns. That is, when country funds do well in one month, they also tend to do well in the next month. At least at monthly horizons, changes in country fund premiums are positively correlated and not mean-reverting.

In summary, the evidence above suggests that country fund premiums provide some information about future fund prices. Specifically, higher (lower) premium levels are associated with more negative (positive) future SP returns. This result is consistent with the investor sentiment hypothesis. However, our findings should be treated with caution, since they are based on limited time-series data and consider the effect only over 4-week intervals. We expect that with a longer time series and more extensive testing, a more complete picture of the predictive power of country fund premiums should emerge.

7. Summary

This article reports a number of regularities in the time-series behavior of closedend country fund prices, NAVs, and premiums. In particular,

[20] See Hodrick (1992) and Jegadeesh (1991) for an alternativc lag structure specification. Estimating their specifications on our data yields similar results.

we show that premiums on closed-end country funds move together, but not with premiums on domestic funds. After controlling for foreign market fundamentals, the stock prices of foreign country funds co-move with the U.S. market while their NAVs do not. These results suggest that country fund stock prices are affected by an additional risk factor which does not affect their NAVs.

We examine the effect of this risk factor on U.S. asset prices and find that both country and domestic fund premium changes are correlated with portfolio returns in the United States. Specifically, small firms earn positive (negative) excess returns when premiums on both types of closed-end funds increase (decrease). Furthermore, we find that the level of the foreign fund premium index forecasts future SP returns. From these results, we conclude that country fund premiums reflect a U.S.-specific risk factor.

While the exact source of this risk is not clear, our findings seem difficult to reconcile with traditional asset pricing models. What macroeconomic factor causes movements in country fund premiums? Why does it affect U.S. asset prices, but not foreign asset prices? Why does the level of the country fund premium index predict future fund returns? The standard view among academics is that stock prices optimally forecast the future flow of real dividends. In this context, all fluctuations in asset prices are attributable to changes in the real economic value of the underlying assets. However, in the case of country funds, it is difficult to understand what fundamental risk differentially affects their SPs and NAVs, and why this risk is correlated with overall U.S. returns.

We suggest that U.S. investor sentiment may be one reason for the movements in country fund premiums. This explanation seems to fit the stylized facts. Premiums of individual funds move together because their stock prices reflect time-varying sentiments of US. investors while their NAVs do not. An index of country fund premiums reflects the differential sentiment of U.S. investors relative to their foreign counterparts. Therefore, a country fund index is positively correlated with U.S. market returns while a domestic fund index is not. Cross-sectionally, small firms are more sensitive to this sentiment and have a higher loading on this factor. Firms with low institutional ownership levels are more sensitive to the domestic premium index, but not to the foreign premium index. Moreover, when the premiums are higher (U.S. investors are more bullish), future SP returns on country funds tend to be lower.

Our findings suggest several possible extensions. First, closed-end country funds trade in other countries beside the United States. The London stock exchange, in particular, currently lists more than 300 closed-end funds, including 45 single-country funds (9 that specialize

in U.S. securities). The sentiment hypothesis implies that the share prices of these funds will be more sensitive to market movements in the United Kingdom than their NAVs. Moreover, if U.K. sentiments are mean-reverting, the premiums on these funds should also predict future SP returns. Studies of U.K. closedend funds have been few,[21] and to our knowledge these predictions of the theory have not been tested.

Second, an increasing number of foreign firms now have American Depositiory Receipts (ADRs) trading in the United States. These ADRs represent claims on the same future cash flows as their underlying assets. Like country fund shares, prices of these ADRs should be closely linked to their asset values by arbitrage. However, any pricing difference between ADRs and their foreign asset equivalents presents another opportunity to evaluate the issues we raise here. Moreover, being firm-specific, ADRs may prove advantageous in evaluating the incorporation of firm-specific information (such as earnings or dividend news) into prices across global markets.[22]

Finally, we recognize that in its current form the sentiment explanation is incomplete. Little is known about the specific pseudo-signals that affect country fund premiums. If these premium changes reflect mass psychology or speculative enthusiasm-things which are "best thought of as coming ultimately from people's minds" [Shiller (1989)]-the challenge is to identify the source of these popular beliefs. Clearly, there is ample room for development along these lines.

Appendix: Foreign Market Indices and Differences in Trading Hours

This appendix reports the sources for the foreign market indices, as well as the trading hours for each foreign exchange. All countries with at least 100 weekly observations of market return and closedend fund data are included. The Datastream market indices are either total return and indicated by the (RI) suffix or price return and indicated by the (PI) suffix. The last column reports the estimated difference (in hours) between the Friday close in each market and the Friday close on the NYSE. The NYSE is the last market to close each day, so differences are in terms of number of hours ahead of the NYSE. These differences are approximate, since use of daylight saving time varies and some exchanges do not have fixed closing times.

[21] Ammer (1990) examines U.K. closed-end funds and documents long-run reversion to fundamentals. He does not, however, focus on U.K. country funds.

[22] Bodurtha (1990) documents different factor price across U.S. domestic equities, U.S. ADRs, and International Depository Receipts (IDRs).

Country	Datastream market index	Exchange and/or index name	Trading hours in local time	Approx. time difference with NYSE
Australia	AUSTALL(RI)	Joint Stock Exchange	M–F 10:00–12:00, 14:00–15:15	15 hrs
France	TTOMKFR(RI)	French index	M–F 9:30–11:00 for large cap. stocks, 12:30–14:30 for second market	5 hrs
Germany	FURTCOM(RI)	Commerzbank index	M–F 11:30–13:30	8 hrs
India[a]	IBOMBSE(PI)	Bombay Stock Exchange 100	M–F 12:00–14:00	13 hrs
Italy	TOTMKIT(RI)	Italian Index	M–F 10:00–13:45 (variable depending on level of trading)	6 hrs
Korea	KORCOMP(PI)	Korea South Composite	M–F 9:40–11:40, 13:20–15:20, Sat. 9:40–11:40	14 hrs
Malaysia	KLPCOMP(PI)	Kuala Lumpur Stock Composite	M–F 10:00–11:00, 11:15–12:30, 14:30–16:00	12 hrs
Mexico[a]	WIMXCOP(PI)	Mexico Index	M–F 8:00–13:40	1 hr
Spain	MADRID(PI)	Madrid Stock Exchange	M–F 9:30–12:30, with a later session for most active secs.	5 hrs
Switzerland	TOTMKSW(RI)	Swiss Bank Corp.	M–F 10:30 opening, flexible closing depending on trading activity	6 hrs
Taiwan[a]	TAIWGHT(PI)	Taiwan Index	M–F 9:00–12:00 Sat. 9:00–11:00	17 hrs
Thai	BNGKBKC(PI)	Bangkok Index	M–F 9:30–11:30	16 hrs
U.K.	FTALLSH(RI)	Financial Times All Share Index	M–F 9:00–17:00 (mandatory quote period)	4 hrs

[a] In addition to the time lags reported in the table, the Mexico and Taiwan funds report their NAV as of Thursday's close, and the India Fund reports its NAV as of Wednesday's close.

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