Sovereign Credit Ratings and International Portfolio Flows

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Abstract

We examine the response of equity mutual fund flows to sovereign rating changes in 85 countries from 1996-2002. We find that the response is asymmetric: Sovereign downgrades are strongly associated with outflows of capital from the downgraded country while improvements in a country's sovereign rating are not associated with discernable changes in equity flows. Lower levels of corruption moderate the response, i.e., less corrupt countries experience smaller outflows around downgrades. Moreover, flows around downgrades are consistent with a flight to quality phenomenon. That is, less corrupt non-event countries are net recipients of capital inflows, and these inflows increase with the severity of the cumulative downgrade abroad. The results remain after controlling for country size, legal traditions, market liquidity, crisis versus non-crisis periods, and are invariant to different assumptions regarding the within-month distribution of equity flows, monthly predicted benchmark flows, and persistence of equity flows. Taken together, the results suggest that lowering corruption could mitigate some of the perceived negative effects associated with global capital flows.

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1. Introduction

It is easy to understand why sovereign credit rating changes are frequently met with price and interest rate adjustments in financial markets, and subsequent commentary in the financial press. Sovereign debt is generally the benchmark for all other debt in an economy thus these reactions reflect the anticipated impact of sovereign ratings throughout the economy. Interestingly these reactions occur, even though cross-country differences in sovereign ratings closely reflect international differences in macroeconomic conditions and interest rates. That is, since the primary data on factors affecting a sovereign's credit worthiness, such as, tax collections, government spending, economic growth, the level of foreign exchange reserves, and exports (net of imports) are generally known at the time of a rating change, a market response to a sovereign rating change would seem to be *prima facie* evidence that rating changes contain new information.[1] Thus, while sovereign ratings summarize available evidence on the state of the economy, changes in ratings frequently trigger a market response, presumably due to a revision in expectations.

The purpose of this study is explore these market reactions to sovereign rating changes further by focusing on the observed response of international portfolio capital flows. Unlike prices, news announcements need not induce capital flows unless the news is interpreted differently by market participants. Given the controversies surrounding the role of rating agencies, e.g., in exacerbating boom/bust cycles in capital flows to emerging economies, a careful examination of flows surrounding rating changes is warranted. Existing evidence of 'trend chasing' and herding in international portfolio flows (e.g., Gelos and Wei, 2004, Froot and Ramadorai, 2003, and Froot, O'Connell and Seasholes, 2001) suggests that even if capital flows anticipate rating changes, there will be additional flows whenever there is a price response to the announcement. Hence, the first question we address in this study is whether rating changes induce portfolio flow reactions.

Beyond simply documenting a capital flow response to sovereign rating change announcements, we also ask whether there are systematic differences in that response according to the type of announcement (upgrade or downgrade), and across countries. One key aspect we investigate is how corruption levels impact capital flows around rating

[1] In addition to cases where rating agencies may have access to information not publicly available, market participants may also perceive that rating agencies possess a comparative advantage in synthesizing macroeconomic data (despite widely noted crisis prediction failures) due to their global focus and continuity of coverage and analysis.

changes. In a recent survey, Tanzi (1998) documents the increasing global attention being paid to corruption and, despite growing awareness of the costs (e.g., Shleifer and Vishny, 1993, and Mauro, 1995), concludes that corruption has likely become *more* prevalent in recent decades. A much discussed case in point is the recent East Asian financial crisis, where corruption, weak corporate governance, and insider dealing are the primary consensus explanations for its severity according to Radelet and Sachs (1998). Given that countries have more influence over domestic corruption levels (e.g., through legislation and enforcement), than say, the overall size of their economy, financial market liquidity, or which legal system they inherited, the prevalence and apparently increasing tendencies toward corruption are puzzling. These considerations lead us to ask whether capital flows in more corrupt countries behave differently than those in less corrupt countries, particularly surrounding sovereign rating announcements.

All existing indexes of corruption are based on international comparisons of perceptions of e.g., the extent of bribery, red tape, public and private sector transparency and accountability, judicial and public sector malfeasance. Since corruption is usually illegal, these surveys are frequently obtained by surveying corporate representatives with international experience. Recent empirical studies have demonstrated an inverse relationship between corruption and aggregate investment and economic growth, public investment in infrastructure and in education, and significantly, that corruption tilts the *composition* of capital flows away from longer term foreign direct investment toward shorter term flows (e.g., Mauro, 1995, Tanzi, 1998, Wei 2000).[2] This latter impact of corruption suggests our second focus in this paper.

Specifically, we investigate whether the impact of ratings changes varies with the level of corruption in an economy. A simple argument based on the information content of a rating change suggests that it may. If, for example, private information is more prevalent in more corrupt economies, a rating change will tend to be interpreted differently than in a less corrupt economy, where agents are better informed about the fundamentals. In this setting, a rating change in a more corrupt economy will induce relatively more trading (i.e., capital flows) since agents interpret the news differently. Gelos and Wei (2004) present some evidence consistent with this idea during crisis episodes, though they

[2] As noted by Tanzi (1998), an extensive public sector facilitates, but is not sufficient for corruption to have negative effects on investment and growth.

emphasize increased investor herding in economies with greater asymmetric information disparities. We extend their findings to include specific news announcements in both crisis and non-crisis periods, and we provide new results on the impact of corruption on cross-country portfolio shifts.

Our primary data set is a monthly panel of mutual fund equity positions covering 85 countries during the seven years 1996-2002. As of December 2002, there are 724 active funds with assets totaling $138 billion (see Table 1). We match these holdings to sovereign credit rating changes, and a host of country-specific data. We use both the cross-section and the time-series dimensions of the data to examine several questions. First, we ask whether the response of flows (aggregated at the country level) to rating change announcements differs by: event type (upgrades versus downgrades); country type (developed versus emerging); a country's legal origin (e.g., common law versus civil law) and rule of law tradition (see, La Porta, Lopez-de-Silanes, Shleifer, and Vishny 1997, 1998, 1999); the liquidity of its equities market (see, Henry, 2000); the size of the real economy; or the initial level of a country's sovereign rating. Second, we investigate whether less corrupt countries are less vulnerable to bad news, such as downgrades. Since the quality and quantity of information is likely to be higher in less corrupt countries, we hypothesize that rating announcements should be less informative and hence induce relatively smaller portfolio adjustments for less corrupt countries relative to more corrupt countries. Third, we explore whether less corrupt non-event countries benefit from bad news abroad by attracting portfolio flows away from countries experiencing downgrades. Finally, since the sample period brackets several crisis episodes, we test whether the response systematically varies between crisis and non-crisis periods.

Our findings can be briefly summarized. First, we find that changes in sovereign credit ratings represent new information to capital markets, as evidenced by a non-zero response of portfolio flows to rating changes. We find that the flow response is asymmetric: Positive rating events lead to no statistically significant capital flows, whereas negative rating events are associated with economically and statistically significant equity outflows. For example, a one-notch downgrade is associated with a contemporaneous outflow of $89.3 million, or equivalently 5.5% of the end of prior month's country allocation (i.e., fund asset positions cumulated across funds invested in a country) from the downgraded country. Second, we find that, as hypothesized, the capital outflow from less

corrupt countries is much reduced around downgrades. In fact, lower corruption fully offsets the effect of a downgrade on capital flows. For example, a one-notch downgrade of a less corrupt country is associated with a statistically insignificant contemporaneous outflow.

Third, interestingly, we find that less corrupt non-event countries are net recipients of capital inflows, and that these inflows increase with the extent of the bad news abroad. For example, a one-notch aggregate downgrade in event countries is associated with $26.6 million inflow, or equivalently 0.8% of the end of prior month's country allocation into a less corrupt non-event country during the same month as that of the downgrade. These results are robust to controlling for country size, legal traditions, market liquidity, crisis versus non-crisis periods, and are invariant to different assumptions regarding the within-month distribution of equity flows, monthly predicted benchmark flows, or persistence of equity flows.

Importantly, our results show that corruption has an independent, statistically significant and economically meaningful effect on portfolio flows even after controlling for the legal origin (e.g., common law versus civil law). That is, corruption is not subsumed by the legal origin. Moreover, while legal origin is exogenous, improving corruption (say, through enactment and enforcement of new laws) is an endogenous choice for any country. An important policy implication of our results is that improving corruption could be beneficial to a sovereign in terms of smaller outflows around negative news (such as downgrades) domestically, and in attracting larger inflows around negative news abroad. At a broader level, lowering corruption could mitigate some of the widely perceived negative effects of greater financial market integration (such as sudden-stops and capital flight), and promote financial development.

The next section provides some background, while Section 3 describes the data we employ. Section 4 presents our findings and Section 5 concludes.

2. Brief review of related studies

This section briefly (i.e., non-exhaustively) describes several key areas of research providing motivation for this study.

2.1. Law and finance

Research stressing the roles of incentives, institutions, and legal traditions in economic outcomes is having widespread impact. In an influential series of papers (e.g., La Porta, Lopez-de-Silanes, Shleifer, and Vishny 1997, 1998, 1999), the authors conclude that legal origin (e.g., common law versus civil law) substantively accounts for cross-country differences in the financial contracting environment, shareholder protection, financial market development, and even the quality of government. Pistor, Raiser and Gelfer (2000) even suggest that inherited institutions (e.g., from colonizers) cannot easily be replaced by legal reform. Others, such as, Rajan and Zingales (2003), argue that inherited institutions cannot explain changes in countries' relative outcomes over time. For example, the authors point out that despite France's civil law tradition, financial development in 1913 was higher in France than in the United States. These shifts suggest that factors that can be changed, (e.g., corruption) could be important.

As noted in the introduction, our results indicate that a country's corruption has an independent (i.e., is not subsumed by the legal origin), statistically significant and economically meaningful effect on portfolio flows around sovereign rating changes.

2.2. International portfolio flows

Among existing studies of international portfolio flows, early work (primarily using data from developed markets) considers whether portfolios are 'optimally' diversified (e.g., Grauer and Hakansson 1987, Tesar and Werner 1995). These studies find considerable scope for further gains from international portfolio diversification. Despite this 'home-bias', researchers find that U.S. investors tend to acquire foreign stocks when foreign returns are high – especially in large equity markets, e.g., Bohn and Tesar (1996). Moreover, Bohn and Tesar find that such 'return-chasing' underperforms a strategy of holding a market-weighted portfolio of foreign equities.

Other studies focus on information asymmetries between foreign and domestic investors. Kang and Stulz (1997) find that foreign investment in Japanese equities is concentrated in the largest firms, which is consistent with foreign investors having relatively less information about small firms than local investors. Brennan and Cao (1997) show that when domestic investors possess an information advantage over foreign (e.g., U.S.) investors about the domestic market, U.S. investors tend to use a momentum strategy

since they, being less well-informed, revise their prior beliefs more than the domestic investors in the foreign market.

More recently, Froot, O'Connell, and Seasholes (2001) examine the evidence of momentum strategies (i.e., inflows increase subsequent to high returns and vice versa) in emerging markets using daily portfolio flows covering flows into and out of 44 countries during the period mid-1994 through 1998. The authors corroborate earlier evidence of momentum, and importantly, find that flows statistically significantly affect future returns. Hence, contemporaneous interest rate effects may only provide a partial view, as they could be influenced by past portfolio flows. This finding motivates the approach we take in this paper.

Finally, Gelos and Wei (2004) study how corruption affects herding and cross-country portfolio allocation by mutual funds. They find that herding is more prevalent in less transparent countries, and such countries are underweighted in international portfolios (i.e., receive less investment from international funds). The authors also find some evidence that less transparent countries experience larger outflows during crises. Given the well known critique by Radelet and Sachs (1998), that the sovereign credit rating agencies failed to predict the onset of the Asian financial crisis, and may have even exacerbated it, a closer look at whether the Gelos and Wei (2004) evidence extends to other settings (e.g., ratings announcements) is warranted.

2.3. Cross-market contagion and spillovers

Further motivation for this study comes from the extensive empirical literature demonstrating transmission of shocks across markets and asset classes (e.g., debt rating changes on stock markets)[3]. Rating changes on corporate (i.e., non-sovereign) bonds have been shown to be associated with significant announcement effects on stock prices. For example, Hand, Holthausen, and Leftwich (1992) analyze the effect of bond rating agency announcements on U.S. stock prices. These authors find differential impacts of upgrades based on the grade (e.g., investment versus non-investment) of the bond being rated and on the direction of the rating change (upgrade versus downgrade).

[3] See Forbes and Rigobon (2002) for a discussion of methodological issues involved in measuring cross-market contagion.

In an international context, Rigobon (2002) examines the impact of an upgrade in sovereign credit rating of Mexico from non-investment grade to investment grade in 2000 and shows a statistically significant change in the propagation of shocks between Mexico and several Latin American countries around the time the upgrade was announced. In addition, Kaminsky and Schmukler (2002) focus on 16 emerging markets and ask whether changes in sovereign credit ratings contribute to market instability. They find evidence of cross-country contagion, particularly during crisis times and among neighbor countries.

3. Data

We use a three-dimensional monthly panel of portfolio holdings of stock funds that invest globally. The data set is commercially available from eMergingPortfolio.com. The panel contains a mixture of fund types, e.g., global, international, regional, and single country funds in the data set. Table 1 lists the country coverage and the number of funds reporting for each as of December 2002. Importantly, the data identifies monthly (end-of-month) holdings, by fund, in 85 countries world wide. The data set begins January 1996 and ends December 2002 (84 months total). At the beginning of the sample the data set contains 368 funds with assets totaling $113 billion; at the end of 2002, there are 724 funds, with a total of $138 billion under management, and in total has 340,428 positive fund-country-month observations.

A second data set that we incorporate into this study includes all sovereign rating changes made by the three principal sovereign rating agencies. Standard & Poor's (S&P) and Moody's Investor Service are widely regarded as the two major sovereign rating agencies, with Fitch Investor Service also frequently mentioned. It is well known that ratings are highly correlated across agencies. As an alternative to replicating each aspect of our analysis on data from each rating agency, we test for the existence of a leader/follower relationship among these agencies. The statistical test is an extension of that in Cooper, Day, and Lewis (2001), who find that 'lead' equity analysts consistently have the greatest market impact. We describe the details of the Cooper, Day, and Lewis (2001) leader-follower ratio (LFR) test and our adaptation of it, in Appendix A. The results indicate that S&P is the lead rating agency. This conclusion remains unchanged whether we restrict the sample to the 85 countries in this study, or if we include all countries rated by at least two rating agencies (i.e., not limited to the 85 countries in Table 1), and whether we consider the entire history of sovereign ratings from 1941-2003, or if we restrict the sample to the

sample period used in this study (1996-2002).[4] Hence we focus our subsequent analysis on ratings announcements by S&P.

A third data set that we use is the country-specific time series of corruption indices provided by the Transparency International. We use Transparency International's corruption perceptions index (CPI) because it is a composite measure based on multiple information sources, is well known, and is available for a large (and growing) number of countries on an annual basis since 1995.[5] In 2003 for example, the Transparency International combined information from 17 independent sources (e.g., the Economist Intelligence Unit, the World Bank, PricewaterhouseCoopers, and Columbia University) to produce a single ranking. An important feature of the CPI is that year-to-year comparisons are made on the basis of the country's score, and thus are unaffected by changes in the number of countries in the annual rankings. The number of countries ranked by Transparency International has grown from 41 in 1995 to 133 today.

We also use other country specific and time series macroeconomic data including: (1) country index returns from Datastream, MSCI, and S&P/IFC; (2) the International Monetary Fund's World Economic Outlook 2003 database; and (3) and the S&P/IFC Global Stock Markets Factbook (2003).

Finally, we include a host of country specific and time-invariant data that have been suggested by related studies, e.g., the legal and institutional market characteristics as suggested in La Porta, R., Lopez-de-Silanes, F., Shleifer, A., Vishny, R., (1997, 1998, 1999), Pistor, Raiser, and Gelfer (2000), and Henry (2000).

4. Empirical specification and results

This section is divided into four parts. In the first part, we discuss issues related to the measurement of capital flows from the underlying portfolio holdings data. Since rating changes can impact the valuation of existing country allocations (especially in emerging markets) as well as flows, we construct measures of flows that account for these valuation

[4] The historical sovereign ratings dataset starts from January 1, 1941 for S&P (United States), February 05, 1949 for Moody's (United States), and August 10, 1994 for Fitch (Austria).

[5] Transparency International's corruption perceptions index has been widely used in recent studies, e.g., Alesina and Weder (2002), and, Treisman (2000). As Alesina and Weder (2002) point out, alternative rankings compiled by different institutions using very different methodologies and sources are highly correlated. Current and past CPI rankings, as well as further information on their construction, is available at http://wwwuser.gwdg.de/~uwvw/corruption.cpi_olderindices.html.

changes. The second part lays out the estimation strategy and discusses our main results. The third part discusses our results on the impact of a country's corruption ranking on the estimated response of portfolio flows to a sovereign credit rating change. This section concludes with additional robustness tests.

4.1. Rating events

In defining a rating event, we follow Gande and Parsley (2003) and consider changes in the stated grade given to a country (represented by the letter-grade D thru AAA) as well as the information in secondary announcements that qualify a country's stated grade. For example, Standard & Poors frequently revises sovereigns on its 'credit outlook' a few months prior to an actual upgrade of a country's stated grade. We term the combined rating (stated rating plus any credit outlook information) as the country's 'comprehensive' credit rating (CCR), and study equity flows in response to changes in the CCR. Procedurally, we numerically code the letter ratings on a scale from 0 (lowest) thru 21 (highest). Similarly, we code the credit outlook on a scale between –1 to +1, in five increments based on the five distinct credit outlook categories S&P uses. We sum these two to produce the comprehensive credit rating. Appendix B presents a tabulation of the construction of the CCR. Thus each country has a rating for each time period, and multiple events during a month are summed; our interest is any change in the aggregate comprehensive credit rating of a sovereign and how this impacts capital flows.

Table 2 presents a summary of the individual country rating changes that occurred during the 1996-2002 period. Overall, there are 247 rating events during this time period. Of these, 115 are upgrades (positive change in the CCR from the prior month) – while 132 are downgrades (negative change in CCR from the prior month). The countries with the largest number of changes during the sample are: Indonesia (16), Turkey (15), Argentina, Russia, and Malaysia (each with 11 events).

Figure 1 presents a monthly view of the time series distribution of rating changes, aggregated across all types of changes (upgrades and downgrades) and across all countries. Figures 2 and 3 present the information for upgrades and downgrades separately. Across all countries, there are very few months with no ratings activity, and activity appears to have both increased and become more variable over time. Downgrades appear to be more clustered, i.e., occurring in several countries simultaneously (or within the month), and are concentrated more toward the latter part of the sample. As pointed out by other authors,

e.g., Radelet and Sachs (1998), the Asian Crisis seems not to have been preceded by an increase in ratings activity.

4.2. Measuring flows

The dependent variable in our regressions is the amount of portfolio equity capital flowing into or out of each country each month. The primary question we address is whether changes in sovereign credit ratings impact these flows. The raw data from eMergingPortfolio.com Fund Research (EPFR) records each fund's holdings (i.e., asset positions) at the end of each month, on a country by country basis. From these holdings data, EPFR computes and markets various measures of cross border capital flows to investment professionals. In this study, we use the raw data provided by EPFR on equity fund holdings. A snapshot of the data is presented in Table 1, which summarizes the number of active funds (i.e., with a positive asset position in equities) in each country, and the aggregate country allocation (i.e., sum across funds active) as of December 2002, the end of our sample period. The table suggests substantial variation along several dimensions: in number of countries; in number of active funds within each country; and, in total allocation in each country.

Typically estimates of monthly capital flows from asset positions are computed as the difference between asset positions at the end of the period (A_t) and those at the beginning of the period (A_{t-1}), compounded for the *ex post* (realized) return (m_t), as in equation 1 below.

$$Flow_t = A_t - A_{t-1} * [1 + m_t] \tag{1}$$

However, estimating the flow resulting from a rating change via a mechanical application of equation 1 is problematic because the event (rating change) has a market impact (which we verify below in Section 4.2.1).[6] What is needed is a measure of the market return *absent* the rating change, i.e., an *ex ante* (expected) return $E(m_t)$ rather than an *ex post* (realized) return m_t. Alternatively, one can think of the return m_t as being comprised of two parts: the expected index return absent a rating change, $E(m_t)$, and the other is the effect of a rating change, δ_t, i.e., $m_t = E(m_t) + \delta_t$. Hence, our estimate of fund flows needs

[6] Note that equation 1 is an appropriate basis for measuring flows when there is no market impact, i.e., whenever the market return can reasonably be expected to be independent of the event, as in studies on mutual funds, such as those analyzing performance, herding, and persistence in highly liquid markets. Here however, such an independence assumption is clearly indefensible (as we demonstrate in Section 4.2.1).

to be based on differences in each fund's investment position from the prior month, and on the expected return on a market index absent a rating change, $E(m_t)$, as shown in equation (2) below.

$$Flow_t = A_t - A_{t-1} * [1 + E(m_t)] \quad (2)$$

We refer to the $Flow_t$ implied by equation 1 as the explicit flow, and the $Flow_t$ implied by equation 2 as the comprehensive flow. Beyond the purely accounting aspect noted above, the comprehensive flow measure can be interpreted as a measure of the economic impact of a rating change. That is, a rating change can have an economic impact either through its direct effect on the explicit flow, or an indirect effect through the market index (or both). Focusing on one (as in the case of the explicit flow) rather than both channels may provide only a partial view of the economic impact of a rating change. Hence, we focus on the comprehensive flow measure throughout this study. For comparison however, we report an initial benchmark specification using the explicit flow computed as in equation 1.

We next discuss the way we measure the expected return, $E(m_t)$, in equation 2, after first verifying that rating changes do have an economically and statistically significant market impact on country index returns. The evidence presented in Section 4.2.1 is the motivation for using the comprehensive flow in this study.

4.2.1. Market impact of rating changes

In this section we use an event study framework to demonstrate the impact of sovereign rating changes on country index returns. Empirically, we estimate the average effect of a rating change on a country index returns ($\overline{\delta}_t$) as follows. Formally, define $\delta_{i,t} = m_{i.t} - E(m_{i.t})$, where $\delta_{i,t}$ is the abnormal return in country i, $m_{i,t}$ is the observed logarithmic return $\ln\left(P_{i,t}/P_{i,t-1}\right)$ on the local market index ($P_{i,t}$, expressed in U.S. dollars), and $E(m_{i.t})$ is the expected return on the i^{th} market's index as predicted from the (OLS) coefficients estimated in the market model regression. That is, $E(m_{i.t}) = \hat{\alpha}_i + \hat{\beta}_i mkt_t$, where mkt_t is the return on a world market index. We assume that in any given country, funds hold that country's index, since the data set provides asset positions in each country at a given point in time (month end) and not individual fund returns. The coefficients $\hat{\alpha}_i, \hat{\beta}_i$ are ordinary least squares (OLS) coefficients from the market-model regression during the estimation time period. We follow Brown and Warner (1985), and test the null

hypothesis that the abnormal return for any month *t* is equal to zero (H_0: $\overline{\delta}_t = 0$) using the ratio of the average abnormal return to its estimated time-series cross-sectional dependence adjusted standard error, i.e.,

$$\frac{\overline{\delta}_t}{\hat{S}_t\left(\overline{\delta}_t\right)} \sim N(0,1)$$

$$\text{where,} \quad \overline{\delta}_t = \frac{1}{N_t}\sum_{i=1}^{N_t}\delta_{it}$$

$$\text{and,} \quad \hat{S}_t\left(\overline{\delta}_t\right) = \frac{1}{59}\left(\sum_{t=-65}^{-6}\left(\overline{\delta}_t - \widetilde{\delta}\right)^2\right), \tag{3}$$

$$\text{where,} \quad \overline{\delta}_t = \frac{1}{N_t}\sum_{i=1}^{N_t}\delta_{it}$$

$$\text{and,} \quad \widetilde{\delta} = \frac{1}{60}\sum_{t=-65}^{-6}\overline{\delta}_t$$

where N_t is the number of countries whose abnormal returns are available at month *t*. For tests over multi-period intervals, e.g., [-1,+1], the test statistic is the ratio of the cumulative average abnormal return (CAR) to its estimated time-series cross-sectional dependence adjusted standard error for the multi-period interval, i.e.,

$$\frac{\sum_{t=-1}^{1}\overline{\delta}_t}{\sum_{t=-1}^{1}\left(\hat{S}^2\left(\overline{\delta}_t\right)\right)^5} \sim N(0,1). \tag{4}$$

Appendix C reports our estimates of $\overline{\delta}_t$, the average effect of a ratings change on the local market index, using monthly index returns. For upgrades, only two months (-1, and 0) appear statistically significant, and the CAR rises by 7.5% . For downgrades, five of the six months [-5, 0] are statistically significant at the 1% level, and in the same two month time frame leading up to a downgrade, the market index drops by 11.5%.[7]

[7] We find evidence of a similar market impact using daily data – though due to data availability we are able to do such analysis only for a sub-sample of 54 countries. Appendix D and Figures 4 and 5 summarize the results. Interestingly, there appears to be some anticipation of the event for both positive and negative rating changes. However, the effect is economically and statistically larger for downgrades. According to the summary at the bottom of Appendix D, the CAR surrounding downgrades is more than twice as large as that for upgrades in absolute value. This impression is also confirmed in Figures 4 and 5.

4.2.2. Flow measures

Before moving to estimation of the flow response to a rating change in the next section, we discuss an additional measurement detail, namely to what extent are the results influenced by the implicit assumption concerning the timing of the flow during the month. That is, because our raw data reflects monthly (end of month) fund investment position data (A_t), our estimate of flows ($Flow_t$) depends on what we assume about how the flows are distributed within the month. To address this issue, we consider several estimates of monthly flows, based on different assumptions as to their timing within each month. In all, we consider results using six different assumptions regarding the intra-month flow. For example, flows could occur on the last day of the month (*Flow measure 1,* same as in equation 2), on the first day of the month (*Flow measure 2*), in the middle of the month (*Flow measure 3*), or distributed in equal amounts at various times during the month (*Flow measures 4-6*). Details of the construction of these measures are provided in Appendix E.

4.3. Measuring flow responses to rating events

As the first step in the empirical analysis, we ask whether flows respond to the type of a ratings event (positive or negative). Specifically, we examine whether the flows during event months are economically and statistically different from flows in non-event months, defined as (a) months where no rating change event occurred in the event country, and more conservatively, or (b) months where no ratings event occurred in <u>any</u> of the sample countries (that is, we consider flows in each event country *i* in months where there was no ratings activity in any country). We initially measure flows by *F6* as described in Appendix E, which assumes the monthly flows are distributed in equal daily amounts.[8] We subsequently consider other flow measures (see Section 4.5 for details).

We examine flow responses to the magnitude of a rating change using the stricter requirement (i.e., using condition b) by pooling the data for all event countries (i), at each event month (t) into two sub-samples, one for positive events, and another for negative events. For ease of interpretation, we normalize the sign of $Event_{i,t}$ to be the same for both negative and positive regressions. That is, $Event_{i,t}$ is defined as the absolute value of the

[8] Flow measure 6 also approximates the behavior of fund managers sensitive to investing a large lump sum of capital, especially in emerging markets (which constitute a large portion of our sample – 61 of the 85 countries) which may have limited 'market depth' and 'liquidity'.

aggregate change in comprehensive credit rating across all days in a month for country, *i*.[9] We stack the event data (positive and negative) with non-event data (defined initially as months where no ratings event occurred in any of the sample countries) to run OLS regressions. By definition, the $Event_{i,t}$ is zero for non-event data.

Our regression equation is given in equation 5, and we present two specifications in Table 3. We report estimates from equation 5 for both upgrades and downgrades beginning with a benchmark regression that includes only the event country's comprehensive credit rating (CCR_{t-1}) as a control variable since it has been noted by other authors, e.g., Cantor and Packer (1996) that a country's credit rating succinctly summarizes the comparative macroeconomic environment of a country. Hence, initially the vector X_k in equation 5 contains controls for the lagged CCR. Appendix F provides more detail on sources and construction of the variables in X_k.

$$Flow_{i,t} = \alpha + \beta_1 Event_{i,t} + \sum_k \beta_k X_k + \varepsilon_{i,t}, \forall i. \tag{5}$$

In the second regression specification of Table 3, we control for important differences among countries, e.g., factors such as size of the economy, market liquidity, and legal origin. Hence, the vector X_k in equation 5 now contains controls for the level of the event country's comprehensive credit rating (CCR), gross domestic product, dummies for emerging/developed status, origin of legal system (i.e., common law versus other forms), rule of law, liquidity, an indicator variable corresponding to crisis periods, and year dummies. Many of these factors have been central to recent contributions concerning the economics of financial markets in emerging countries (e.g., Henry, 2000, La Porta, Lopez-de-Silanes, Shleifer, and Vishny 1997, 1998, 1999). Moreover, capital flows have been the center of global attention following the succession of national crises during the time period under study. Hence, given the time frame and cross country breadth of the current data set, the inclusion of these controls seems warranted. Subsequently, we consider additional explanatory variables as well as different definitions of the dependent variable.

Clearly, portfolio flows appear to respond to rating changes, and the effect is asymmetric. That is, positive rating events (in columns 1 and 2 of Table 3), have no discernable impact on portfolio flows (the coefficient on *Event* is not statistically different

[9] This does not affect our interpretation of the coefficients since we run the positive and negative analysis separately.

from zero). Negative rating events, in contrast, are associated with portfolio outflows, i.e., the coefficient has the anticipated sign and is statistically significant at the 1% level for negative rating events. According to the table, on average, a one-notch downgrade in the sovereign credit rating is associated with a $115.4 million outflow (see column 4) of capital from the country experiencing a negative rating event.

In Table 4, we present the results as a percentage of the previous month's country allocation, i.e., we scale the dependent variable by the aggregate (i.e., summed across all funds investing in a country) asset position. On average, a one-notch downgrade in a country's sovereign credit rating is associated with an outflow of 6.9% (see column 4) of the previous month's country allocation. The results are qualitatively similar to those obtained in Table 3, and the explanatory power is higher than in Table 3. Hence, we will report percentage flows for the remainder of the paper, though we do report dollar amounts in appendices.

The results so far utilize a non-event sample defined as flows in months where no ratings event occurred in <u>any</u> of the sample countries. In Appendix G we repeat the analysis in Table 3, defining the non-event sample for each country as flows in months where no rating event occurred in the event country. As shown in the table, the results are qualitatively unchanged using this looser benchmark. Hence, in the remainder of the paper we will focus on the stricter benchmark of non-event data.

For comparison, we replicate Table 4 using the explicit flow (computed using equation 1) rather than the comprehensive flow (equation 2), measured as a percentage of the previous month's country allocation. The results are presented in Appendix H. As expected, the results are qualitatively similar, albeit the statistical significance is marginally lower. Since the explicit flow presents only a partial view of the effect of a rating change (see Section 4.2), the estimated coefficient on *Event* is lower.

Thus we conclude that rating changes have an asymmetric effect. One possible explanation for the direction-specific impact of rating changes on flows is that rating agencies may be reluctant to lowering the sovereign credit rating or the credit outlook due to a fear of losing continued access to critical information, such as the level of foreign currency reserves, etc., which may be privately observed by the foreign governments.[10]

[10] Asymmetric effects have been documented in studies of interest rate effects in both sovereign debt markets (Gande and Parsley, 2003) and in domestic asset markets (Goh and Ederington, 1993). A reluctance to

4.4. Corruption

Based on the importance and increasing attention paid to governance and public accountability issues in recent years, we analyze the link between rating changes and corruption levels. Since we find no discernable portfolio flows around positive rating events, we primarily concentrate the discussion on rating downgrades. Specifically, we investigate whether less corrupt countries are less vulnerable to bad news, such as rating downgrades. Since the amount and quality of information is likely to be higher in less corrupt countries, we hypothesize that downgrades should be less informative and hence induce smaller portfolio adjustments for less corrupt countries.

To test this hypothesis, we define a low corruption country as having a ranking of 7.5 or above (out of 10) on Transparency International's corruption perceptions index (CPI). We take a literal reading of the rankings so that a country enters the sample only after the country has been ranked by Transparency International.[11] In principle, the time-series dimension allows each country's score to reflect whether corruption improved or worsened year by year.

The regression results are summarized in Table 5 for the comprehensive flow in percentage terms. The asymmetric pattern of portfolio response to ratings changes is confirmed. For example, a one-notch downgrade is associated with a contemporaneous outflow of 5.5% (see column 3) of the end of prior month's country allocation (i.e., fund asset positions cumulated across funds invested in a country) from the downgraded country. In Appendix I, we report the results in dollar terms. The results are qualitatively similar, e.g., a one-notch downgrade is associated with a contemporaneous outflow of $89.3 million from the downgraded country.

The marginal effect of the corruption variable interacted with the $Event_{i,t}$ variable is positive for downgrades (and statistically insignificant for upgrades), suggesting that an additional beneficial effect of lower corruption is that it can dampen the capital flight

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downgrade has been well documented in the literature on equity analysts. For example, Womack (1996) documents that "… new buy recommendations occur seven times more often than sell recommendations, suggesting that brokers are reluctant to issue sell recommendations".

[11] However, in order to maintain our cross-section of 85 countries, we also considered an alternative ranking that used the first ranking available to 'back-cast' a country's ranking to the beginning of the data set. For example, if a country first appears in 1998, we used its 1998 corruption score for 1996 and 1997. In practice, this had little impact on the results; hence we report only the results with the literal ranking. Our results are also unaffected by redefining high corruption as the top 25% of distribution of rankings.

associated with a negative rating event. In fact, lower corruption fully offsets the effect of a downgrade on capital flows, e.g., a one-notch downgrade of a less corrupt country is associated with a statistically insignificant contemporaneous outflow. This result is not simply re-stating that less corrupt countries have higher credit ratings; the result here suggests that *changes* in ratings have larger effects in more corrupt countries. The other control variables used in the regressions in Appendix I and Table 5 have signs and significance levels comparable to those in Table 3 and Table 4 respectively.

We explore the impact of corruption levels further by examining spillover effects of flows, i.e., flows into and out of other (i.e., non-event) countries surrounding ratings events. In particular, in Table 6 we report regressions (in percentage terms as in Table 5) for the sample of non-event countries. In this case, *Event* is defined as the absolute aggregate change (from the previous month) in the comprehensive credit rating across all event countries during a month. For non-event countries, the *Event* variable is not statistically significant, regardless of the specification. The variables we are most interested in however are those relating to corruption. In particular, we find that less corrupt countries are recipients of higher levels of capital inflows surrounding downgrades. The marginal effect of the corruption variable interacted with the $Event_{i,t}$ variable is positive for downgrades in Table 6, suggesting that capital is flowing out of countries being downgraded (based on evidence in Table 5), and into less corrupt non-event countries. For example, a one-notch aggregate downgrade in event countries is associated with an inflow of 0.8% (see column 3) of the end of prior month's country allocation (statistically significant at the 5% level) into a less corrupt non-event country during the same month as that of the aggregate downgrade. Interestingly, the evidence in Table 6 (see columns 1 and 2) suggests that non-event countries attract capital flows from event countries, even when the (aggregate) event is an upgrade. That is, the crisis period effect appears to swamp the positive rating effect, resulting in a capital flow spillover to non-event countries. As before, for completeness, we report the results in Appendix J in dollar terms for non-event countries. The explanatory power is higher, and the results in Appendix J are qualitatively similar to those in Table 6, e.g., a one-notch aggregate downgrade in event countries is associated with an inflow of $26.6 million inflow into a less corrupt non-event country during the same month as that of the aggregate downgrade.

Overall our results can be summarized as follows: First, we find evidence of informational value in sovereign credit ratings – sovereign credit rating changes are associated with significant flows for the country experiencing a rating change. Second, this effect is asymmetric: Positive rating events have no discernable impact on portfolio flows, whereas negative rating events are associated with portfolio outflows. Third, we find that less corrupt countries experience less capital flight following downgrades. In fact, lower corruption fully offsets the effect of a downgrade on capital flows, i.e., for less corrupt countries the flow response is statistically insignificant. Finally, we find that less corrupt non-event countries are net recipients of capital inflows around downgrades, and that these inflows increase with the extent of the bad news abroad.

4.5. Robustness

Next we conduct several robustness checks to the core results presented in Tables 5 and 6. First, it may be argued that our results implicitly assume that every fund in our sample has the ability to shift its investment from one country to another. In fact however, some of the funds are single-country funds. In Tables 7 and 8, we consider this issue by aggregating the flows of only the global funds (i.e., those invested in more than one country) rather than all funds at a country-level. The results are qualitatively similar to those in Tables 5 and 6.

Second, we check whether our results depend on the particular flow measure we have chosen from those described in Appendix E. Specifically, one may argue that since the exact date (within a month) of deployment of funds flow into the equities of a country is unobservable, an unbiased estimate of the date of deployment of funds flow is the middle of the month, the relevant flow measure may not be *F6*. Hence we repeat the regressions in Tables 5 and 6 by replacing the dependent variable flow measure 6 with flow measure 3 (and similarly the lagged dependent variable). The results, presented in Tables 9 and 10, are again qualitatively unchanged. In addition, we repeat the regressions in Tables 5 and 6 with other flow measures (not reported here) and the results remain qualitatively similar.

Finally, we investigate whether our results are driven by outliers. In Tables 11 and 12 we run the regressions in Tables 5 and 6 after excluding approximately one percent of our sample (observations with studentized residuals, i.e., residuals in an OLS regression

divided by their standard deviation, greater than 2.5 or lower than -2.5). Again, the results are qualitatively the same as before, although here the statistical significance and overall fit of the regression model improves. Hence, we conclude that our results are not driven by these types of measurement and data issues.

5. Conclusions

Using data from 85 countries, from 1996-2002, we find that sovereign rating changes are valuable in terms of their information. We find that rating changes are associated with significant changes in contemporaneous portfolios flows. This finding is robust to the different ways of measuring capital flows that we consider in this study. We find that the effects are asymmetric; sovereign downgrades are strongly associated with outflows of capital from the country being downgraded while improvements in a country's sovereign rating are not associated with discernable changes in equity flows. Low levels of corruption however, are associated with a statistically significant reduction in the responsiveness of equity flows to downgrades. Moreover, observed flows are consistent with a flight to quality phenomenon. That is, aggregating rating changes across event countries, we find that less corrupt non-event countries are net recipients of capital inflows, and that these inflows increase with the severity of the aggregate downgrade abroad. These results do not appear sensitive to country size, legal traditions, market liquidity, or crisis versus non-crisis periods, and are robust to different assumptions regarding the within-month distribution of equity flows, monthly predicted benchmark flows, or persistence of equity flows.

Our analysis has several implications related to the impact and value of sovereign credit rating agencies, as well as (a) how countries are likely to be affected, (b) which subsets are most impacted, and (c) the ultimate influence on the cost of capital to firms. At a broader level, it is clear that the impact itself can be affected by public policy – such as encouraging more competition, regulation, and corruption. In particular, our results suggest that reducing corruption may mitigate some of the widely perceived negative effects of greater financial market integration.

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Table 1: Number of funds per country and aggregate country allocation, December 2002

The following table lists the number of active funds (i.e., with a positive asset position) in each country (reported by eMergingPortfolio.com), and the aggregate country allocation (i.e., sum across all active funds) as of December 2002, the end of our sample period.

	Country	*Active Funds*	*Allocation ($m)*
1	Argentina	104	148.11
2	Australia	140	3,060.22
3	Austria	45	172.72
4	Bahrain	1	1.11
5	Bangladesh	2	1.25
6	Belgium	42	606.02
7	Bolivia	0	0.00
8	Botswana	3	2.42
9	Brazil	255	5,530.88
10	Bulgaria	2	0.20
11	Canada	83	2,611.30
12	Chile	148	986.05
13	China	361	4,006.46
14	Colombia	14	19.97
15	Cote d'Ivoire	0	0.00
16	Croatia	79	227.75
17	Cyprus	1	0.29
18	Czech Republic	149	534.52
19	Denmark	63	731.43
20	Ecuador	4	6.66
21	Egypt	39	131.86
22	Estonia	47	114.12
23	Finland	97	1,842.04
24	France	105	5,359.96
25	Germany	97	3,167.03
26	Ghana	5	30.05
27	Greece	37	121.91
28	Hong Kong	365	6,596.51
29	Hungary	179	1,410.68
30	India	296	5,421.07
31	Indonesia	202	1,156.66
32	Ireland	49	436.92
33	Israel	154	586.50
34	Italy	91	1,517.97
35	Jamaica	0	0.00
36	Japan	146	11,761.16
37	Jordan	3	10.15
38	Kazakhstan	1	1.45
39	Kenya	2	0.71
40	Korea, South	415	15,233.12
41	Latvia	0	0.00
42	Lebanon	4	1.37
43	Lithuania	7	2.76
44	Malawi	6	0.12
45	Malaysia	284	1,997.75
46	Mauritius	4	2.05
47	Mexico	255	7,087.56
48	Morocco	13	20.58
49	Namibia	0	0.00
50	Netherlands	96	4,578.26
51	New Zealand	69	235.78
52	Nigeria	10	11.86
53	Norway	50	643.92
54	Oman	7	7.29
55	Pakistan	8	6.80
56	Panama	7	0.66
57	Papua New Guinea	0	0.00
58	Peru	99	158.23
59	Philippines	128	457.57
60	Poland	163	1,245.80
61	Portugal	45	134.59
62	Romania	8	39.10
63	Russia	210	3,595.92
64	Saudi Arabia	1	1.56
65	Singapore	290	2,160.73
66	Slovakia	5	1.28
67	Slovenia	7	8.96
68	South Africa	147	3,179.94
69	Spain	92	2,178.63
70	Sri Lanka	21	43.51
71	Sweden	77	1,565.67
72	Switzerland	101	4,320.48
73	Taiwan	362	5,464.45
74	Tajikistan	0	0.00
75	Thailand	291	1,896.07
76	Tunisia	3	0.80
77	Turkey	149	885.18
78	Ukraine	8	1.64
79	United Kingdom	106	13,447.53
80	United States	69	8,794.93
81	Uruguay	0	0.00
82	Venezuela	72	52.09
83	Vietnam	11	10.84
84	Zambia	0	0.00
85	Zimbabwe	4	5.30
	Total	7,115	137,794.82

Table 2: Number and type of rating changes, by country

The following table lists the number of sovereign credit rating changes by Standard & Poors' (S&P) during 1996-2002 by country, and by type: upgrades (pos.), downgrades (neg.), and the total for each of the 85 countries for which we have country specific fund investment position data. See Appendix B for a more complete description of positive and negative rating events.

	Country	Pos.	Neg.	Total		Country	Pos.	Neg.	Total
1	Argentina	2	9	11	44	Malawi	0	0	0
2	Australia	1	0	1	45	Malaysia	5	6	11
3	Austria	0	0	0	46	Mauritius	0	0	0
4	Bahrain	0	0	0	47	Mexico	4	1	5
5	Bangladesh	0	0	0	48	Morocco	0	1	1
6	Belgium	0	0	0	49	Namibia	0	0	0
7	Bolivia	0	2	2	50	Netherlands	0	0	0
8	Botswana	0	0	0	51	New Zealand	2	1	3
9	Brazil	2	4	6	52	Nigeria	0	0	0
10	Bulgaria	2	0	2	53	Norway	0	0	0
11	Canada	2	0	2	54	Oman	2	1	3
12	Chile	1	0	1	55	Pakistan	3	6	9
13	China	0	1	1	56	Panama	1	2	3
14	Colombia	0	4	4	57	Papua New Guinea	1	4	5
15	Cote d'Ivoire	0	0	0	58	Peru	2	3	5
16	Croatia	1	1	2	59	Philippines	3	4	7
17	Cyprus	0	2	2	60	Poland	4	1	5
18	Czech Republic	0	1	1	61	Portugal	1	0	1
19	Denmark	1	0	1	62	Romania	4	3	7
20	Ecuador	2	1	3	63	Russia	6	5	11
21	Egypt	0	1	1	64	Saudi Arabia	0	0	0
22	Estonia	1	0	1	65	Singapore	0	0	0
23	Finland	2	0	2	66	Slovakia	5	2	7
24	France	0	0	0	67	Slovenia	1	0	1
25	Germany	0	0	0	68	South Africa	2	1	3
26	Ghana	0	0	0	69	Spain	1	1	2
27	Greece	4	0	4	70	Sri Lanka	0	0	0
28	Hong Kong	2	2	4	71	Sweden	2	0	2
29	Hungary	5	0	5	72	Switzerland	0	0	0
30	India	2	4	6	73	Taiwan	0	2	2
31	Indonesia	4	12	16	74	Tajikistan	0	0	0
32	Ireland	2	0	2	75	Thailand	2	4	6
33	Israel	1	2	3	76	Tunisia	1	0	1
34	Italy	1	0	1	77	Turkey	6	9	15
35	Jamaica	1	1	2	78	Ukraine	0	1	1
36	Japan	0	4	4	79	United Kingdom	0	0	0
37	Jordan	2	2	4	80	United States	0	0	0
38	Kazakhstan	4	1	5	81	Uruguay	1	5	6
39	Kenya	0	0	0	82	Venezuela	2	6	8
40	Korea, South	5	4	9	83	Vietnam	0	0	0
41	Latvia	1	0	1	84	Zambia	0	0	0
42	Lebanon	2	5	7	85	Zimbabwe	0	0	0
43	Lithuania	1	0	1					
						Total	115	132	247

Table 3: Asymmetric effects of rating changes

This table presents the coefficient estimates from the following equation:

$$F6_{i,t} = \alpha + \beta_1 Event_{i,t} + \sum_k \beta_k X_k + \varepsilon_{i,t}, \forall i.$$

The dependent variable is the change in mutual fund asset allocation levels in country *i* (the event country) at time *t*. Here, we report flow measure *F6*, which assumes the monthly flows are distributed in equal daily amounts throughout the month. For each country with a rating event, we include in the regressions flows in event months and flows in non-event months where there was no change in the comprehensive credit rating (event) for any of the countries in our sample. The expected return for a country index (used in constructing the flow measure) is based on a single-factor market model regression of the index returns of a country on the returns on a world index during an estimation period of 60 months, i.e., from [-65,-6] where month 0 represents an event month. *Event* is defined as the absolute change (from the previous month) in the comprehensive credit rating in country *i*. A positive rating event is defined as a positive change in the comprehensive credit rating from the prior month. A downgrade, or negative rating event, is defined as a decline in the comprehensive credit rating from the prior month. Regressions include variables for the lagged comprehensive credit rating, country status as emerging/developed, origin of legal system (i.e., common law versus other forms), rule of law, GDP, liquidity, and an indicator variable corresponding to crisis periods. See Appendices E and F for a complete description of variable construction. The superscript a indicates statistical significance at the 1% level using robust standard errors in a two-tailed test.

	Positive rating events				Negative rating events			
	(1)		(2)		(3)		(4)	
	Coeff	T-stat	Coeff	T-stat	Coeff	T-stat	Coeff	T-stat
Constant	64.062	1.158	-20.469	-0.139	70.933	1.031	253.597	1.374
Event	9.348	0.489	-2.292	-0.105	-113.917	-4.930[a]	-115.385	-4.109[a]
Comprehensive credit rating (lagged)	0.034	0.007	2.154	0.235	-1.359	-0.186	-1.795	-0.261
Emerging			17.147	0.261			-158.427	-1.272
Common law			-38.953	-0.589			-23.868	-0.370
Rule of law			9.082	0.531			5.459	0.318
GDP			0.201	0.980			0.033	0.554
Liquidity			89.208	1.593			46.112	0.993
Crisis			38.812	0.608			-114.874	-0.998
Year Dummies	no		yes		no		yes	
Adjusted R^2	-0.007		0.023		0.059		0.119	
Observations	250		250		267		267	

Table 4: Asymmetric effects of rating changes (percent)

This table presents the coefficient estimates from the following equation:

$$(F6_{i,t} / CA_{i,t-1}) = \alpha + \beta_1 Event_{i,t} + \sum_k \beta_k X_k + \varepsilon_{i,t}, \forall i.$$

The dependent variable is the change in mutual fund asset allocation levels in country *i* (the event country) at time *t*. Here, we report flow measure *F6* deflated by the lagged country allocation (CA), i.e., fund asset position cumulated across all funds investing in a country. This measure assumes that the monthly flows are distributed in equal daily amounts throughout the month. For each country with a rating event, we include in the regressions flows in event months and flows in non-event months where there was no change in the comprehensive credit rating (event) for any of the countries in our sample. The expected return for a country index (used in constructing the flow measure) is based on a single-factor market model regression of the index returns of a country on the returns on a world index during an estimation period of 60 months, i.e., from [-65,-6] where month 0 represents an event month. *Event* is defined as the absolute change (from the previous month) in the comprehensive credit rating in country *i*. A positive rating event is defined as a positive change in the comprehensive credit rating from the prior month. A downgrade, or negative rating event, is defined as a decline in the comprehensive credit rating from the prior month. Regressions include variables for the lagged comprehensive credit rating, country status as emerging/developed, origin of legal system (i.e., common law versus other forms), rule of law, GDP, liquidity, and an indicator variable corresponding to crisis periods. See Appendices E and F for a complete description of variable construction. The superscripts a and c indicate statistical significance at the 1% and 10% levels using robust standard errors in a two-tailed test.

	Positive rating events				Negative rating events			
	(1)		(2)		(3)		(4)	
	Coeff	T-stat	Coeff	T-stat	Coeff	T-stat	Coeff	T-stat
Constant	0.058	1.955[c]	0.028	0.529	0.037	1.364	0.022	0.327
Event	0.014	1.165	0.005	0.410	-0.073	-5.031[a]	-0.069	-3.649[a]
Comprehensive credit rating (lagged)	-0.003	-1.339	-0.005	-1.861[c]	-0.001	-0.473	-0.002	-0.826
Emerging			0.022	0.919			0.016	0.403
Common law			0.031	1.519			0.023	1.014
Rule of law			0.015	1.737[c]			0.012	1.369
GDP			0.000	-0.259			0.000	1.165
Liquidity			0.003	0.344			0.001	0.162
Crisis			0.025	0.813			-0.048	-1.165
Year Dummies	no		yes		no		yes	
Adjusted R^2	0.015		0.034		0.157		0.183	
Observations	250		250		267		267	

Table 5: Asymmetric effects of rating changes and corruption (percent)

This table presents the coefficient estimates from the following equation:

$$(F6_{i,t} / CA_{i,t-1}) = \alpha + \beta_1 Event_{i,t} + \sum_k \beta_k X_k + \varepsilon_{i,t}, \forall i.$$

The dependent variable is the change in mutual fund asset allocation levels in country *i* (the event country) at time *t*. Here, we report flow measure *F6* deflated by the lagged country allocation (CA), i.e., fund asset position cumulated across all funds investing in a country. This measure assumes that the monthly flows are distributed in equal daily amounts. For each country with a rating event, we include in the regressions flows in event months, and flows in non-event months where there was no change in the comprehensive credit rating (event) for any of the countries in our sample. Corruption is an indicator that takes the value 1 if the country's corruption index is greater than 7.5 out of 10. The expected return for a country index (used in constructing the flow measure) is based on a single-factor market model regression of the index returns of a country on the returns on a world index during an estimation period of 60 months, i.e., from [-65,-6] where month 0 represents an event month. *Event* is defined as the absolute change (from the previous month) in the comprehensive credit rating in country *i*. A positive rating event is defined as an increase in the comprehensive credit rating, and a negative rating event occurs whenever the comprehensive credit rating declines from the prior month. Regressions include variables for lagged flow measure *F6* (percent), the lagged comprehensive credit rating, country status as emerging/developed, origin of legal system (i.e., common law versus other forms), rule of law, GDP, liquidity, an interactive variable formed from the Corruption and Event variables, and an indicator variable corresponding to crisis periods. See Appendices E and F for a complete description of variable construction. The superscript a indicates statistical significance at the 1% level using robust standard errors in a two-tailed test.

	Positive rating events				Negative rating events			
	(1)		(2)		(3)		(4)	
	Coeff	T-stat	Coeff	T-stat	Coeff	T-stat	Coeff	T-stat
Constant	0.037	0.704	0.036	0.688	-0.003	-0.040	-0.008	-0.116
Event	0.008	0.582	0.008	0.586	-0.055	-3.170[a]	-0.055	-3.173[a]
Comprehensive credit rating (lagged)	-0.004	-1.343	-0.004	-1.344	-0.002	-0.898	-0.002	-0.916
Lagged Flow (percent)	0.088	0.723	0.088	0.725	0.080	1.240	0.080	1.243
Emerging	0.016	0.663	0.018	0.748	0.027	0.872	0.032	0.834
Common law	0.024	1.034	0.023	1.089	0.021	0.922	0.020	0.925
Rule of law	0.010	1.078	0.010	1.058	0.013	1.528	0.013	1.528
GDP	-0.000	-0.320	-0.000	-0.341	0.000	1.327	0.000	1.385
Corruption	-0.007	-0.238			-0.010	-0.382		
Corruption x Event	0.012	0.204	0.008	0.140	0.122	3.023[a]	0.119	3.180[a]
Liquidity	-0.006	-0.641	-0.006	-0.627	-0.006	-0.701	-0.006	-0.698
Crisis	0.025	0.784	0.025	0.782	-0.039	-1.038	-0.039	-1.035
Year Dummies	yes		yes		yes		yes	
Adjusted R^2	0.020		0.024		0.187		0.191	
Observations	240		240		253		253	

Table 6: Non-event country effects and corruption (percent)

This table presents the coefficient estimates from the following equation:

$$(F6_{j,t} / CA_{j,t-1}) = \alpha + \beta_1 Event_t + \sum_k \beta_k X_k + \varepsilon_{j,t}, \forall j.$$

The dependent variable is the change in mutual fund asset allocation levels in country *j* (a non-event country) at time *t*. Here, we report flow measure *F6*, deflated by the lagged country allocation (CA), i.e., fund asset position cumulated across all funds investing in a country. This measure assumes that the monthly flows are distributed in equal daily amounts. For each rating event, we include in the regressions flows in the event months, and flows in non-event months. Corruption is an indicator that takes the value 1 if the country's corruption index is greater than 7.5 out of 10. The expected return for a country index (used in constructing the flow measure) is based on a single-factor market model regression of the index returns of a country on the returns on a world index during an estimation period of 60 months, i.e., from [-65,-6] where month 0 represents an event month. *Event* is defined as the absolute aggregate change (from the previous month) in the comprehensive credit rating across all event countries *i* *(≠ j)*. A positive rating event is defined as one if the aggregate ratings change is positive (and zero otherwise), and a negative rating event is defined as one if the aggregate ratings change is negative (and zero otherwise). Regressions include variables for lagged flow measure *F6* (percent), the lagged comprehensive credit rating, country status as emerging/developed, origin of legal system (i.e., common law versus other forms), rule of law, GDP, corruption, liquidity, an interactive variable formed from the Corruption and Event variables, and an indicator variable corresponding to crisis periods. See Appendices E and F for a complete description of variable construction. The superscripts a, b, and c indicate statistical significance at the 1%, 5%, and 10% levels using robust standard errors in a two-tailed test.

	Positive rating events				Negative rating events			
	(1)		(2)		(3)		(4)	
	Coeff	T-stat	Coeff	T-stat	Coeff	T-stat	Coeff	T-stat
Constant	-0.002	-0.097	0.005	0.187	0.030	1.226	0.028	1.136
Event	-0.000	-0.051	-0.001	-0.414	-0.001	-0.590	-0.001	-0.467
Comprehensive credit rating (lagged)	-0.003	-2.497[b]	-0.003	-2.394[b]	-0.003	-2.283[b]	-0.003	-2.309[b]
Lagged Flow (percent)	-0.004	-0.058	-0.005	-0.062	0.067	1.589	0.068	1.604
Emerging	0.023	2.111[b]	0.014	1.203	-0.006	-0.449	-0.003	-0.218
Common law	0.012	1.642	0.017	2.183[b]	-0.004	-0.479	-0.006	-0.745
Rule of law	0.008	2.073[b]	0.009	2.295[b]	0.009	2.185[b]	0.008	2.122[b]
GDP	-0.000	-0.828	-0.000	-0.753	-0.000	-0.366	-0.000	-0.354
Corruption	0.037	2.107[b]			-0.015	-0.985		
Corruption x Event	-0.006	-1.632	0.000	0.000	0.008	2.208[b]	0.006	1.915[c]
Liquidity	0.001	0.341	0.001	0.188	0.002	0.461	0.002	0.499
Crisis	0.033	3.525[a]	0.033	3.500[a]	-0.002	-0.155	-0.002	-0.187
Year Dummies	yes		yes		yes		yes	
Adjusted R^2	0.034		0.031		0.030		0.030	
Observations	1352		1352		1356		1356	

Table 7: Asymmetric effects of rating changes and corruption (global funds, percent)

This table presents the coefficient estimates from the following equation:

$$(F6_{i,t} / CA_{i,t-1}) = \alpha + \beta_1 Event_{i,t} + \sum_k \beta_k X_k + \varepsilon_{i,t}, \forall i.$$

The dependent variable is the change in mutual fund asset allocation levels in country *i* (the event country) at time *t*. Here, we report flow measure *F6* deflated by the lagged country allocation (CA), i.e., fund asset position cumulated across all global funds investing in a country. This measure assumes that the monthly flows are distributed in equal daily amounts. For each country with a rating event, we include in the regressions flows in event months, and flows in non-event months where there was no change in the comprehensive credit rating (event) for any of the countries in our sample. Corruption is an indicator that takes the value 1 if the country's corruption index is greater than 7.5 out of 10. The expected return for a country index (used in constructing the flow measure) is based on a single-factor market model regression of the index returns of a country on the returns on a world index during an estimation period of 60 months, i.e., from [-65,-6] where month 0 represents an event month. *Event* is defined as the absolute change (from the previous month) in the comprehensive credit rating in country *i*. A positive rating event is defined as an increase in the comprehensive credit rating, and a negative rating event occurs whenever the comprehensive credit rating declines from the prior month. Regressions include variables for lagged flow measure *F6* (percent), the lagged comprehensive credit rating, country status as emerging/developed, origin of legal system (i.e., common law versus other forms), rule of law, GDP, liquidity, an interactive variable formed from the Corruption and Event variables, and an indicator variable corresponding to crisis periods. See Appendices E and F for a complete description of variable construction. The superscript a indicates statistical significance at the 1% level using robust standard errors in a two-tailed test.

	Positive rating events				Negative rating events			
	(1)		(2)		(3)		(4)	
	Coeff	T-stat	Coeff	T-stat	Coeff	T-stat	Coeff	T-stat
Constant	0.030	0.555	0.029	0.532	-0.017	-0.269	-0.025	-0.353
Event	0.009	0.648	0.009	0.655	-0.051	-2.868[a]	-0.051	-2.872[a]
Comprehensive credit rating (lagged)	-0.004	-1.253	-0.004	-1.255	-0.002	-0.668	-0.002	-0.689
Lagged Flow (percent)	0.106	0.933	0.106	0.938	0.078	1.212	0.078	1.215
Emerging	0.017	0.627	0.019	0.759	0.032	1.007	0.039	0.986
Common law	0.025	1.052	0.023	1.067	0.022	0.913	0.021	0.910
Rule of law	0.010	1.118	0.010	1.085	0.014	1.554	0.014	1.554
GDP	-0.000	-0.283	-0.000	-0.316	0.000	1.352	0.000	1.443
Corruption	-0.012	-0.360			-0.013	-0.503		
Corruption x Event	0.013	0.205	0.006	0.100	0.126	3.107[a]	0.122	3.234[a]
Liquidity	-0.006	-0.602	-0.006	-0.573	-0.006	-0.628	-0.006	-0.623
Crisis	0.029	0.871	0.029	0.869	-0.041	-1.076	-0.041	-1.071
Year Dummies	yes		yes		yes		yes	
Adjusted R^2	0.014		0.018		0.170		0.174	
Observations	240		240		253		253	

Table 8: Non-event country effects and corruption (global funds, percent)

This table presents the coefficient estimates from the following equation:

$$(F6_{j,t} / CA_{j,t-1}) = \alpha + \beta_1 Event_t + \sum_k \beta_k X_k + \varepsilon_{j,t}, \forall j.$$

The dependent variable is the change in mutual fund asset allocation levels in country *j* (a non-event country) at time *t*. Here, we report flow measure *F6*, deflated by the lagged country allocation (CA), i.e., fund asset position cumulated across all global funds investing in a country. This measure assumes that the monthly flows are distributed in equal daily amounts. For each rating event, we include in the regressions flows in the event months, and flows in non-event months. Corruption is an indicator that takes the value 1 if the country's corruption index is greater than 7.5 out of 10. The expected return for a country index (used in constructing the flow measure) is based on a single-factor market model regression of the index returns of a country on the returns on a world index during an estimation period of 60 months, i.e., from [-65,-6] where month 0 represents an event month. *Event* is defined as the absolute aggregate change (from the previous month) in the comprehensive credit rating across all event countries *i (≠ j)*. A positive rating event is defined as one if the aggregate ratings change is positive (and zero otherwise), and a negative rating event is defined as one if the aggregate ratings change is negative (and zero otherwise). Regressions include variables for lagged flow measure *F6* (percent), the lagged comprehensive credit rating, country status as emerging/developed, origin of legal system (i.e., common law versus other forms), rule of law, GDP, corruption, liquidity, an interactive variable formed from the Corruption and Event variables, and an indicator variable corresponding to crisis periods. See Appendices E and F for a complete description of variable construction. The superscripts a, b, and c indicate statistical significance at the 1%, 5%, and 10% levels using robust standard errors in a two-tailed test.

	Positive rating events				Negative rating events			
	(1)		(2)		(3)		(4)	
	Coeff	T-stat	Coeff	T-stat	Coeff	T-stat	Coeff	T-stat
Constant	-0.008	-0.325	-0.001	-0.036	0.023	0.916	0.020	0.815
Event	0.000	0.154	-0.000	-0.199	-0.001	-0.637	-0.001	-0.504
Comprehensive credit rating (lagged)	-0.003	-2.215[b]	-0.003	-2.111[b]	-0.003	-1.902[c]	-0.003	-1.930[c]
Lagged Flow (percent)	0.013	0.177	0.012	0.171	0.067	1.609	0.068	1.626
Emerging	0.024	2.212[b]	0.016	1.315	-0.002	-0.163	0.001	0.103
Common law	0.013	1.688[c]	0.018	2.207[b]	-0.005	-0.514	-0.007	-0.798
Rule of law	0.007	1.944[c]	0.008	2.159[b]	0.008	2.042[b]	0.008	1.972[b]
GDP	-0.000	-1.031	-0.000	-0.974	-0.000	-0.471	-0.000	-0.456
Corruption	0.036	2.022[b]			-0.016	-1.051		
Corruption x Event	-0.007	-1.717[c]	-0.001	-0.182	0.009	2.306[b]	0.006	1.971[b]
Liquidity	0.003	0.974	0.003	0.833	0.003	0.686	0.003	0.727
Crisis	0.036	3.895[a]	0.036	3.873[a]	-0.001	-0.129	-0.002	-0.163
Year Dummies	yes		yes		yes		yes	
Adjusted R^2	0.034		0.032		0.026		0.026	
Observations	1352		1352		1356		1356	

Table 9: Asymmetric effects of rating changes (flow measure 3, percent)

This table presents the coefficient estimates from the following equation:

$$(F3_{i,t} / CA_{i,t-1}) = \alpha + \beta_1 Event_t + \sum_k \beta_k X_k + \varepsilon_{i,t}, \forall i.$$

The dependent variable is the change in mutual fund asset allocation levels in country *i* (the event country) at time *t*. Here, we report flow measure *F3*, deflated by the lagged country allocation (CA), i.e., fund asset position cumulated across all funds investing in a country. This measure assumes that the monthly flows are distributed as a lump sum amount at the middle of a month. For each country with a rating event, we include in the regressions flows in event months, and flows in non-event months where there was no change in the comprehensive credit rating (event) for any of the countries in our sample. Corruption is an indicator that takes the value 1 if the country's corruption index is greater than 7.5 out of 10. The expected return for a country index (used in constructing the flow measure) is based on a single-factor market model regression of the index returns of a country on the returns on a world index during an estimation period of 60 months, i.e., from [-65,-6] where month 0 represents an event month. *Event* is defined as the absolute change (from the previous month) in the comprehensive credit rating in country *i*. A positive rating event is defined as an increase in the comprehensive credit rating, and a negative rating event occurs whenever the comprehensive credit rating declines from the prior month. Regressions include variables for lagged flow measure *F3* (percent), the lagged comprehensive credit rating, country status as emerging/developed, origin of legal system (i.e., common law versus other forms), rule of law, GDP, corruption, liquidity, an interactive variable formed from the Corruption and Event variables, and an indicator variable corresponding to crisis periods. See Appendices E and F for a complete description of variable construction. The superscript a indicates statistical significance at the 1% level using robust standard errors in a two-tailed test.

	Positive rating events				Negative rating events			
	(1)		(2)		(3)		(4)	
	Coeff	T-stat	Coeff	T-stat	Coeff	T-stat	Coeff	T-stat
Constant	0.037	0.703	0.036	0.688	-0.003	-0.040	-0.008	-0.117
Event	0.008	0.582	0.008	0.586	-0.055	-3.167[a]	-0.055	-3.170[a]
Comprehensive credit rating (lagged)	-0.004	-1.344	-0.004	-1.346	-0.002	-0.902	-0.002	-0.920
Lagged Flow (percent)	0.087	0.721	0.088	0.723	0.080	1.236	0.080	1.238
Emerging	0.017	0.665	0.018	0.750	0.027	0.875	0.033	0.836
Common law	0.024	1.035	0.023	1.089	0.021	0.924	0.020	0.926
Rule of law	0.010	1.081	0.010	1.061	0.013	1.532	0.013	1.532
GDP	-0.000	-0.321	-0.000	-0.342	0.000	1.328	0.000	1.387
Corruption	-0.008	-0.240			-0.010	-0.384		
Corruption x Event	0.013	0.207	0.009	0.143	0.122	3.032[a]	0.120	3.189[a]
Liquidity	-0.006	-0.639	-0.006	-0.625	-0.006	-0.700	-0.006	-0.697
Crisis	0.025	0.783	0.025	0.782	-0.039	-1.039	-0.039	-1.036
Year Dummies	yes		yes		yes		yes	
Adjusted R^2	0.020		0.024		0.187		0.191	
Observations	240		240		253		253	

Table 10: Non-event country effects and corruption (flow measure 3, percent)

This table presents the coefficient estimates from the following equation:

$$(F3_{j,t} / CA_{j,t-1}) = \alpha + \beta_1 Event_t + \sum_k \beta_k X_k + \varepsilon_{j,t}, \forall j.$$

The dependent variable is the change in mutual fund asset allocation levels in country *j* (a non-event country) at time *t*. Here, we report flow measure *F3*, deflated by the lagged country allocation (CA), i.e., fund asset position cumulated across all funds investing in a country. This measure assumes that the monthly flows are distributed as a lump sum amount at the middle of a month. For each rating event, we include in the regressions flows in the event months, and flows in non-event months. Corruption is an indicator that takes the value 1 if the country's corruption index is greater than 7.5 out of 10. The expected return for a country index (used in constructing the flow measure) is based on a single-factor market model regression of the index returns of a country on the returns on a world index during an estimation period of 60 months, i.e., from [-65,-6] where month 0 represents an event month. *Event* is defined as the absolute aggregate change (from the previous month) in the comprehensive credit rating across all event countries *i (≠ j)*. A positive rating event is defined as one if the aggregate ratings change is positive (and zero otherwise), and a negative rating event is defined as one if the aggregate ratings change is negative (and zero otherwise). Regressions include variables for lagged flow measure *F3* (percent), the lagged comprehensive credit rating, country status as emerging/developed, origin of legal system (i.e., common law versus other forms), rule of law, GDP, corruption, liquidity, an interactive variable formed from the Corruption and Event variables, and an indicator variable corresponding to crisis periods. See Appendices E and F for a complete description of variable construction. The superscripts a, b, and c indicate statistical significance at the 1%, 5%, and 10% levels using robust standard errors in a two-tailed test.

	Positive rating events				Negative rating events			
	(1)		(2)		(3)		(4)	
	Coeff	T-stat	Coeff	T-stat	Coeff	T-stat	Coeff	T-stat
Constant	-0.002	-0.091	0.005	0.192	0.030	1.227	0.028	1.137
Event	-0.000	-0.056	-0.001	-0.419	-0.001	-0.594	-0.001	-0.471
Comprehensive credit rating (lagged)	-0.003	-2.499[b]	-0.003	-2.396[b]	-0.003	-2.284[b]	-0.003	-2.310[b]
Lagged Flow (percent)	-0.004	-0.058	-0.005	-0.062	0.067	1.590	0.068	1.605
Emerging	0.023	2.111[b]	0.014	1.202	-0.006	-0.448	-0.003	-0.216
Common law	0.012	1.644	0.017	2.184[b]	-0.004	-0.477	-0.006	-0.743
Rule of law	0.008	2.070[b]	0.009	2.292[b]	0.009	2.185[b]	0.008	2.122[b]
GDP	-0.000	-0.830	-0.000	-0.756	-0.000	-0.366	-0.000	-0.354
Corruption	0.037	2.104[b]			-0.015	-0.987		
Corruption x Event	-0.006	-1.629	0.000	0.002	0.008	2.210[b]	0.006	1.915[c]
Liquidity	0.001	0.339	0.001	0.187	0.002	0.460	0.002	0.499
Crisis	0.033	3.525[a]	0.033	3.500[a]	-0.002	-0.159	-0.002	-0.191
Year Dummies	yes		yes		yes		yes	
Adjusted R^2	0.034		0.031		0.030		0.030	
Observations	1352		1352		1356		1356	

Table 11: Asymmetric effects of rating changes (excluding outliers, percent)

This table presents the coefficient estimates from the following equation:

$$(F6_{i,t} / CA_{i,t-1}) = \alpha + \beta_1 Event_{i,t} + \sum_k \beta_k X_k + \varepsilon_{i,t}, \forall i.$$

The dependent variable is the change in mutual fund asset allocation levels in country *i* (the event country) at time t. Here, we report flow measure *F6* deflated by the lagged country allocation (CA), i.e., fund asset position cumulated across all funds investing in a country. This measure assumes that the monthly flows are distributed in equal daily amounts. For each country with a rating event, we include in the regressions flows in event months, and flows in non-event months where there was no change in the comprehensive credit rating (event) for any of the countries in our sample. Corruption is an indicator that takes the value 1 if the country's corruption index is greater than 7.5 out of 10. The expected return for a country index (used in constructing the flow measure) is based on a single-factor market model regression of the index returns of a country on the returns on a world index during an estimation period of 60 months, i.e., from [-65,-6] where month 0 represents an event month. Event is defined as the absolute change (from the previous month) in the comprehensive credit rating in country i. A positive rating event is defined as an increase in the comprehensive credit rating, and a negative rating event occurs whenever the comprehensive credit rating declines from the prior month. Regressions include variables for lagged flow measure *F6* (percent), the lagged comprehensive credit rating, country status as emerging/developed, origin of legal system (i.e., common law versus other forms), rule of law, GDP, liquidity, an interactive variable formed from the Corruption and Event variables, and an indicator variable corresponding to crisis periods. See Appendices E and F for a complete description of variable construction. This table repeats the analysis in Table 5 excluding outliers – identified as those observations from the regressions in Table 5 associated with absolute studentized residuals greater than 2.5 (i.e., lower than -2.5 or higher than 2.5). The superscripts a, b, and c indicate statistical significance at the 1%, 5%, and 10% levels using robust standard errors in a two-tailed test.

	Positive rating events				Negative rating events			
	(1)		(2)		(3)		(4)	
	Coeff	T-stat	Coeff	T-stat	Coeff	T-stat	Coeff	T-stat
Constant	0.046	0.952	0.045	0.935	-0.009	-0.145	-0.008	-0.122
Event	-0.000	-0.059	-0.000	-0.047	-0.049	-3.010[a]	-0.049	-3.012[a]
Comprehensive credit rating (lagged)	-0.002	-0.640	-0.002	-0.641	-0.001	-0.471	-0.001	-0.471
Lagged Flow (percent)	0.161	2.674[a]	0.161	2.681[a]	0.122	2.063[b]	0.122	2.063[b]
Emerging	0.005	0.190	0.007	0.291	0.021	0.696	0.020	0.534
Common law	0.030	1.601	0.028	1.670[c]	0.009	0.439	0.009	0.455
Rule of law	0.004	0.597	0.004	0.551	0.012	1.469	0.012	1.470
GDP	-0.000	-0.855	-0.000	-0.902	0.000	1.814[c]	0.000	1.751[c]
Corruption	-0.010	-0.339			0.002	0.063		
Corruption x Event	0.003	0.060	-0.002	-0.035	0.108	2.803[a]	0.109	3.102[a]
Liquidity	-0.000	-0.038	-0.000	-0.002	-0.007	-0.915	-0.007	-0.920
Crisis	0.010	0.468	0.009	0.466	-0.032	-0.924	-0.032	-0.925
Year Dummies	yes		yes		yes		yes	
Adjusted R^2	0.086		0.090		0.226		0.230	
Observations	232		232		245		245	

Table 12: Non-event country effects and corruption (excluding outliers, percent)

This table presents the coefficient estimates from the following equation:

$$(F6_{j,t} / CA_{j,t-1}) = \alpha + \beta_1 Event_t + \sum_k \beta_k X_k + \varepsilon_{j,t}, \forall j.$$

The dependent variable is the change in mutual fund asset allocation levels in country *j* (a non-event country) in month *t* with rating changes in event countries. Here, we report flow measure *F6*, deflated by the lagged country allocation (CA), i.e., fund asset position cumulated across all funds investing in a country. This measure assumes that the monthly flows are distributed in equal daily amounts. For each rating event, we include in the regressions flows in the event months, and flows in non-event months. Corruption is an indicator that takes the value 1 if the country's corruption index is greater than 7.5 out of 10. The expected return for a country index (used in constructing the flow measure) is based on a single-factor market model regression of the index returns of a country on the returns on a world index during an estimation period of 60 months, i.e., from [-65,-6] where month 0 represents an event month. *Event* is defined as the absolute aggregate change (from the previous month) in the comprehensive credit rating across all event countries *i (≠ j)*. A positive rating event is defined as one if the aggregate ratings change is positive (and zero otherwise), and a negative rating event is defined as one if the aggregate ratings change is negative (and zero otherwise). Regressions include variables for lagged flow measure *F6* (percent), the lagged comprehensive credit rating, country status as emerging/developed, origin of legal system (i.e., common law versus other forms), rule of law, GDP, corruption, liquidity, an interactive variable formed from the Corruption and Event variables, and an indicator variable corresponding to crisis periods. See Appendices E and F for a complete description of variable construction. This table repeats the analysis in Table 6 excluding outliers – identified as those observations from the regressions in Table 6 associated with absolute studentized residuals greater than 2.5 (i.e., lower than -2.5 or higher than 2.5). The superscripts a, b, and c indicate statistical significance at the 1%, 5%, and 10% levels using robust standard errors in a two-tailed test.

	Positive rating events				Negative rating events			
	(1)		(2)		(3)		(4)	
	Coeff	T-stat	Coeff	T-stat	Coeff	T-stat	Coeff	T-stat
Constant	-0.007	-0.393	-0.004	-0.230	0.000	0.017	-0.001	-0.069
Event	-0.000	-0.171	-0.001	-0.527	0.001	0.345	0.001	0.689
Comprehensive credit rating (lagged)	-0.003	-3.016[a]	-0.003	-2.952[a]	-0.001	-1.074	-0.001	-1.207
Lagged Flow (percent)	0.069	2.195[b]	0.070	2.227[b]	0.107	3.783[a]	0.109	3.838[a]
Emerging	0.020	2.102[b]	0.015	1.699[c]	0.009	0.805	0.011	1.065
Common law	0.009	1.388	0.013	2.052[b]	0.003	0.417	0.001	0.120
Rule of law	0.008	2.522[b]	0.008	2.693[a]	0.006	1.811[c]	0.006	1.765[c]
GDP	-0.000	-0.964	-0.000	-0.915	-0.000	-0.503	-0.000	-0.509
Corruption	0.020	1.772[c]			-0.012	-0.869		
Corruption x Event	-0.002	-0.702	0.001	0.568	0.007	1.899[c]	0.005	1.766[c]
Liquidity	0.005	1.833[c]	0.005	1.738[c]	-0.001	-0.183	0.000	0.052
Crisis	0.038	4.761[a]	0.039	4.851[a]	-0.007	-0.811	-0.006	-0.669
Year Dummies	yes		yes		yes		yes	
Adjusted R^2	0.075		0.075		0.064		0.062	
Observations	1320		1320		1317		1317	

Appendix A: Leader-follower ratio (LFR)

This appendix describes the Cooper, Day, and Lewis (2001), hereafter CDL, test for whether a particular rating agency (or equity analyst in their case) leads or lags other rating agencies in making rating change announcements. In their study of earnings forecasts by individual analysts in U.S. equity markets, CDL develop a methodology to rank analysts based on whether they lead or follow other analysts in announcing forecast revisions. We adapt their procedure to the case of sovereign rating changes, and compare the three principal sovereign credit rating agencies (S&P, Moody's, and Fitch). The procedure identifies leaders by comparing the rating activity of other agencies (e.g., Moody's, and Fitch) in the period before and after a rating change by a particular agency (say, S&P). Following CDL, we define $t^0_{jik}(t^1_{jik})$ as the number of days by which forecast i of other rating agencies (Moody's and Fitch) precedes (follows) forecast k of a selected rating agency (e.g., S&P). In our context we focus on the forecast of each of the other rating agencies immediately preceding or lagging forecast k of a selected rating agency (i.e., N=1 below). Aggregating over all rating announcements (k) of a selected rating agency, the time to the immediately preceding forecast across all other rating agencies, and across all countries (j), defines the cumulative lead-time for the selected rating agency, T_0:

$$T_0 = \sum_{j=1}^{J}\sum_{i=1}^{N}\sum_{k=1}^{K} t^0_{jik} \ .$$

The cumulative lag-time, T_1, for the given firm is defined similarly using t^1_{ik}. That is,

$$T_1 = \sum_{j=1}^{J}\sum_{i=1}^{N}\sum_{k=1}^{K} t^1_{jik} \ .$$

Next, we form the leader-follower ratio (LFR) for a particular rating agency, as the ratio of aggregate lead time T_0, to aggregate lag time, i.e., $LFR = T_0/T_1$. This test statistic is distributed as $F_{(2JNK,\ 2JNK)}$, and since a lead rating agency systematically releases ratings changes before other agencies, the ratio will be greater than one. See CDL (2001) for additional details. We summarize the test for each of the three agencies (S&P, Moody's, and Fitch) for four different samples. In column (a) we use only the 85 countries in Table 1 during the sample period 1996-2002, in column (b) we consider historical ratings data for the same 85 sample countries from 1941-2003, in column (c) we include ratings of all countries (i.e., not limited to the 85 countries in Table 1) during the sample period, and finally, in column (d) we use the historical ratings data for all countries from 1941-2003. P-values are given in parenthesis below the empirical LFR test statistic. The superscript b implies statistical significance at the 5% level.

	LFR Test Statistic and (p-value)			
Rating Agency:	(a)	(b)	(c)	(d)
Standard & Poor's	1.276 (0.025)[b]	1.295 (0.015)[b]	1.277 (0.025)[b]	1.294 (0.015)[b]
Moody's	1.095 (0.232)	1.128 (0.158)	1.101 (0.219)	1.132 (0.147)
Fitch	0.954 (0.641)	1.012 (0.462)	0.977 (0.570)	1.033 (0.396)

Appendix B: Comprehensive credit rating

This appendix describes the construction of the comprehensive credit rating (CCR) measure. The reported credit rating is assigned a numerical code from 0 thru 21 as indicated to obtain the explicit credit rating (ECR). Next, we add the reported information on the credit outlook (OL), coded from -1 to +1, to obtain the comprehensive credit rating (CCR), i.e., CCR = ECR + OL. For example, if a country is rated BB+ with stable credit outlook, its ECR and CCR are 11. If S&P revises the outlook to credit watch-negative. (from stable), the ECR is still 11. However, its CCR is 10.50.

Explicit Credit Rating

Sovereign Rating	*ECR*
AAA	21
AA+	20
AA	19
AA-	18
A+	17
A	16
A-	15
BBB+	14
BBB	13
BBB-	12
BB+	11
BB	10
BB-	9
B+	8
B	7
B-	6
CCC+	5
CCC	4
CCC-	3
CC	2
C	1
SD, D	0

Credit Outlook

	Add to ECR
Positive	1
Credit Watch-Developing	0.5
Stable	0
Credit Watch-Negative	-0.5
Negative	-1

Appendix C: Monthly event study results

This table presents the average cumulative abnormal return (CAR) of the effect of a sovereign credit rating change on portfolio flows. We compute the average abnormal returns (AR), i.e., $\overline{\delta}_t$ in equation (3) based on the market-model adjusted method. That is, the monthly return based on a market-model regression using the World Market Index, is subtracted from the local country's monthly index return as explained in Section 4.2.1. The returns are computed based on indices measured in U.S. dollars. The t-statistics of ARs and CARs are computed using the methodology of Brown and Warner (1985) that considers both the time-series and cross-sectional dependence in returns, where a, b, and c stand for significance at the 1%, 5%, and 10% levels using a two-tailed test.

Positive rating changes				***Negative rating changes***			
Month	N	AR	T-stat	Month	N	AR	T-stat
-5	104	2.34%	1.538	-5	114	-3.64%	-3.130[a]
-4	104	2.00%	1.316	-4	114	-1.57%	-1.354
-3	104	2.38%	1.567	-3	114	-3.08%	-2.649[a]
-2	104	1.66%	1.096	-2	114	-3.56%	-3.063[a]
-1	104	3.57%	2.352[b]	-1	114	-6.35%	-5.458[a]
0	104	3.95%	2.599[a]	0	114	-5.15%	-4.426[a]
1	104	-0.22%	-0.142	1	114	0.13%	0.112
2	104	2.31%	1.521	2	114	1.96%	1.686[c]
3	104	1.18%	0.778	3	114	-1.19%	-1.025
4	104	0.10%	0.066	4	114	-1.16%	-1.000
5	104	1.41%	0.931	5	114	1.36%	1.166
Months	N	ACAR	T-stat	Months	N	ACAR	T-stat
(-5,+5)	104	20.68%	4.107[a]	(-5,+5)	114	-22.26%	-5.771[a]
(-2,+2)	104	11.28%	3.321[a]	(-2,+2)	114	-12.97%	-4.986[a]
(-1,+1)	104	7.30%	2.777[a]	(-1,+1)	114	-11.37%	-5.642[a]
(-1, 0)	104	7.52%	3.501[a]	(-1, 0)	114	-11.50%	-6.989[a]
(0,+1)	104	3.73%	1.737[c]	(0,+1)	114	-5.02%	-3.051[a]

Appendix D: Daily event study results

This table presents the average cumulative abnormal return (CAR) of the effect of a sovereign credit rating change on portfolio flows. We compute the average abnormal returns (AR), i.e., $\overline{\delta}_t$ in equation (3) based on the market-model adjusted method. That is, the monthly return based on a market-model regression using the World Market Index, is subtracted from the local country's monthly index return as explained in Section 4.2.1. The returns are computed based on indices measured in U.S. dollars. The t-statistics of ARs and CARs are computed using the methodology of Brown and Warner (1985) that considers both the time-series and cross-sectional dependence in returns, where a, b, and c stand for significance at the 1%, 5%, and 10% levels using a two-tailed test.

Positive rating changes				***Negative rating changes***			
Day	N	AR	T-stat	Day	N	AR	T-stat
-10	107	-0.10%	-0.479	-10	109	-0.24%	-0.808
-9	107	0.39%	1.913[c]	-9	109	0.05%	0.170
-8	107	-0.02%	-0.087	-8	109	-0.40%	-1.323
-7	107	-0.02%	-0.089	-7	109	-0.60%	-1.995[b]
-6	107	0.11%	0.511	-6	109	-0.19%	-0.649
-5	107	-0.09%	-0.452	-5	109	-0.45%	-1.504
-4	107	0.41%	1.982[b]	-4	109	-0.17%	-0.580
-3	107	0.09%	0.452	-3	109	-0.92%	-3.080[a]
-2	107	0.02%	0.120	-2	109	-0.94%	-3.130[a]
-1	107	0.33%	1.604	-1	109	-0.79%	-2.632[a]
0	107	0.88%	4.272[a]	0	109	-1.07%	-3.574[a]
1	107	0.11%	0.550	1	109	-0.27%	-0.886
2	107	-0.34%	-1.653[c]	2	109	0.33%	1.098
3	107	-0.11%	-0.538	3	109	0.96%	3.220[a]
4	107	-0.18%	-0.894	4	109	0.13%	0.435
5	107	0.04%	0.194	5	109	0.12%	0.409
6	107	-0.25%	-1.192	6	109	-0.18%	-0.585
7	107	-0.02%	-0.094	7	109	0.36%	1.210
8	107	0.11%	0.518	8	109	-0.30%	-1.001
9	107	0.09%	0.460	9	109	0.10%	0.337
10	107	0.64%	3.120[a]	10	109	0.20%	0.679
Days	N	CAR	T-stat	Days	N	CAR	T-stat
(-10,+10)	107	2.10%	2.230[b]	(-10,+10)	109	-4.25%	-3.097[a]
(-5,+5)	107	1.16%	1.700[c]	(-5,+5)	109	-3.06%	-3.083[a]
(-2,+2)	107	1.01%	2.188[b]	(-2,+2)	109	-2.73%	-4.081[a]
(-1,+1)	107	1.32%	3.710[a]	(-1,+1)	109	-2.12%	-4.095[a]
(-1, 0)	107	1.21%	4.155[a]	(-1, 0)	109	-1.86%	-4.388[a]
(0,+1)	107	0.99%	3.409[a]	(0,+1)	109	-1.34%	-3.154[a]

Appendix E: Measures of international portfolio flows

This appendix describes the construction of several different measures of monthly equity flows discussed in the text. The measures described here reflect different assumptions concerning the timing of the flows within the month – since our raw data reflect monthly (end of month) fund investment position data (A_t), and not the intra-month timing of flows (FN_t). Empirically, we estimate fund flows based on differences in the fund investment position from the prior month, and on the estimated expected return on a market index ($E(m_t)$). We estimate $E(m_t)$ by an event study approach, where the expected return on a market index ($E(m_t)$) is obtained by regressing the country's index returns on the returns on a world index using during a 60 month estimation period, i.e., from [-65,-6] where month 0 represents an event month. We consider several different flow measures for robustness.

Unadjusted flow measure: The unadjusted flow measure ($F0_t$) is simply the difference in the fund investment position data, aggregated across all funds investing in a particular country. We define the unadjusted flow measure as:

$$F0_t = A_t - A_{t-1}$$

Flow measure 1: This measure assumes that a fund flow is invested as a single lump sum amount at the end of the month. We define flow measure 1 as follows:

$$F1_t = A_t - A_{t-1} * [1 + E(m_t)]$$

Flow measure 2: This measure assumes that the fund flow is invested as a lump sum amount at the beginning of a month. We define flow measure 2 as:

$$F2_t = \frac{A_t - A_{t-1} * [1 + E(m_t)]}{[1 + E(m_t)]}$$

Flow measure 3: This measure assumes that the fund flow is invested as a lump sum amount at the middle of a month. We define flow measure 3 as:

$$F3_t = \frac{A_t - A_{t-1} * [1 + E(m_t)]}{[1 + E(m_t)]^{1/2}}$$

Flow measure 4-6: Flow measures 4-6 assume that flows are distributed throughout the month at regularly spaced intervals. Measure 4 assumes that the fund flow is invested as two equal amounts, one half at the middle of a month, and the other half at the end of a month. Flow measure 5 assumes that a fund flow is invested in four equal amounts, one quarter each at the end of first, second, third and fourth weeks. Finally, flow measure 6 assumes that the flow amount is invested in equal amounts daily. For simplification, we assume there are 20 trading days in a month. In general, it can be shown be shown that flow measures 4 thru 6 can be characterized by:

$$FN_t = \frac{\{A_t - A_{t-1} * [1 + E(m_t)]\} \{[1 + E(m_t)]^{1/n} - 1\}}{\{E(m_t)/n\}}.$$

Substituting n=2 in the above expression yields flow measure 4. Similarly, substituting n=4 in the above expression yields flow measure 5, and finally substituting n=20 in the above expression yields flow measure 6.

Appendix F: Sources and description of independent variables

This appendix describes the construction of the variables in our econometric tests of effects of rating changes and a brief description of the data sources.

Emerging: An indicator variable that takes a value of one if a country is an emerging market and zero otherwise. The primary source for this variable is the Standard & Poors' (S&P) Global Stock Markets 2003 Factbook. Three countries (Papua New Guinea, Tajikistan, and Vietnam) were not listed as either developed or emerging markets in the S&P Global Stock Markets 2003 Factbook. We classified these as emerging markets based on the International Finance Corporation (IFC)'s 2003 Annual Report and the Euromoney's Internet Securities Inc (ISI) Emerging Markets website (http://www.securities.com).

Comprehensive credit rating: A variable that takes a value from 0 to 21 as described in Appendix B, where a higher value indicates a stronger (e.g., investment grade) credit rating.

Event: Absolute change (from the previous month) in the comprehensive credit rating of a country.

Flow: The estimated flow of funds into a country, measured in millions of U.S. dollars as described in the text and in Appendix E.

Common Law: An indicator variable that takes a value of one (and zero otherwise) if the legal origin of a country is identified as having an English common law system as tabulated in Appendix B of La Porta, Lopez-de-Silanes, Shleifer, and Vishny (1999).

Rule of Law: A variable that takes a value from 0 to 6, where higher values indicate a higher tradition for law and order. The primary source for this variable is the rule of law variable from the La Porta, Lopez-de-Silanes, and Shleifer (2002) dataset (http://www.som.yale.edu/Faculty/fl69/datasets/gbk_allvar.xls). For the ten countries in our sample with missing values, namely Croatia, Czech Republic, Estonia, Kazakhstan, Latvia, Lithuania, Russia, Slovenia, and Tajikistan, we obtained the rule of law variable from Pistor, Raiser and Gelfer (2000), and scaled it to be between 0 and 6. For example, the rule of law measure of 7 for Croatia from Pistor, Raiser and Gelfer (2000) which is based on a scale from 0 to 10, was converted to 4.20 to be based on a scale from 0 to 6.

Crisis: An indicator variable that takes a value of one (and zero otherwise) if a sample observation is from a crisis period, such as the Asian (7:01:97- 3:31:98), Russian (8:01:98 - 12:31:98), Brazilian (1:01:99 - 3:31:99), Turkish (11:15:00 – 2:28:01), and the Argentinean (12:03:01 - 2:03:02) crises.

Corruption: An indicator variable that takes a value of one (and zero otherwise) if a country has a high level of corruption (i.e., a perceived lower level of corruption), namely a score greater than 7.5 (on a scale of 0-10) in the Corruption Perception Index produced by Transparency International data (http://www.corruption.org). Note that since we use data from each annual publication of the Index, the set of high corruption countries changes each year.

Liquidity: Following Henry (2000), we calculate our liquidity as the value of shares traded divided by the stock market capitalization. The source for this variable is the Standard & Poors' (S&P) Global Stock Markets 2003 Factbook which provides annual data for constructing this variable. Those countries not listed in the S&P Global Stock Markets 2003 Factbook (Papua New Guinea, Tajikistan, and Vietnam) were assigned missing values.

GDP: The source for this variable, measured annually in current U.S. dollars is the World Economic Outlook Database (http://www.imf.org/external/pubs/ft/weo/2003/02/data/index.htm).

Appendix G: Asymmetric effects of rating changes (alternative definition of non-events)

This table presents the coefficient estimates from the following equation:

$$F6_{i,t} = \alpha + \beta_1 Event_{i,t} + \sum_k \beta_k X_k + \varepsilon_{i,t}, \forall i.$$

The dependent variable is the change in mutual fund asset allocation levels in country *i* (the event country) at time t. Here, we report flow measure *F6*, which assumes the monthly flows were distributed in equal daily amounts throughout the month. For each country with a rating event, we include in the regressions flows in event months and flows in non-event months where there was no change in the comprehensive credit rating (event) of the same country. The expected return for a country index (used in constructing the flow measure) is based on a single-factor market model regression of the index returns of a country on the returns on a world index during an estimation period of 60 months, i.e., from [-65,-6] where month 0 represents an event month. *Event* is defined as the absolute change (from the previous month) in the comprehensive credit rating in country *i*. A positive rating event is defined as a positive change in the comprehensive credit rating from the prior month. A downgrade, or negative rating event, is defined as a decline in the comprehensive credit rating from the prior month. Regressions include variables for the lagged comprehensive credit rating, country status as emerging/developed, origin of legal system (i.e., common law versus other forms), rule of law, GDP, liquidity, and an indicator variable corresponding to crisis periods. See Appendices E and F for a complete description of variable construction. The superscripts a, b, and c, imply statistical significance at the 1%, 5%, and 10% levels using robust standard errors in a two-tailed test.

	Positive rating events				Negative rating events			
	(1)		(2)		(3)		(4)	
	Coeff	T-stat	Coeff	T-stat	Coeff	T-stat	Coeff	T-stat
Constant	32.474	2.305[b]	-25.982	-0.683	43.561	2.175[b]	-83.905	-1.350
Event	33.167	1.565	31.121	1.528	-87.428	-4.334[a]	-79.245	-3.899[a]
Comprehensive credit rating (lagged)	-2.843	-2.535[b]	0.512	0.239	-3.848	-1.900[c]	0.793	0.366
Emerging			57.737	2.289[b]			122.481	2.328[b]
Common law			-26.651	-1.529			-4.864	-0.279
Rule of law			-3.071	-0.636			-2.487	-0.514
GDP			0.070	1.283			0.052	1.790[c]
Liquidity			14.645	0.857			2.649	0.194
Crisis			41.959	2.487[b]			33.538	1.743[c]
Year Dummies	no		yes		no		yes	
Adjusted R^2	0.002		0.031		0.007		0.038	
Observations	2468		2468		2327		2327	

Appendix H: Asymmetric effects of rating changes (explicit flow measure 6, percent)

This table presents the coefficient estimates from the following equation:

$$(F6_{i,t} / CA_{i,t-1}) = \alpha + \beta_1 Event_{i,t} + \sum_k \beta_k X_k + \varepsilon_{i,t}, \forall i.$$

The dependent variable is the change in mutual fund asset allocation levels in country *i* (the event country) at time t. Here, we report the flow measure *F6* deflated by the lagged country allocation (CA), i.e., fund asset position cumulated across all funds investing in a country. This measure assumes that the monthly flows are distributed in equal daily amounts throughout the month. For each country with a rating event, we include in the regressions flows in event months and flows in non-event months where there was no change in the comprehensive credit rating (event) for any of the countries in our sample. The realized return for a country index is used in constructing the explicit flow measure. *Event* is defined as the absolute change (from the previous month) in the comprehensive credit rating in country *i*. A positive rating event is defined as a positive change in the comprehensive credit rating from the prior month. A downgrade, or negative rating event, is defined as a decline in the comprehensive credit rating from the prior month. Regressions include variables for the lagged comprehensive credit rating, country status as emerging/developed, origin of legal system (i.e., common law versus other forms), rule of law, GDP, liquidity, and an indicator variable corresponding to crisis periods. See Appendices E and F for a complete description of variable construction. The superscripts b and c indicate statistical significance at the 5% and 10% levels using robust standard errors in a two-tailed test.

	Positive rating events				Negative rating events			
	(1)		(2)		(3)		(4)	
	Coeff	T-stat	Coeff	T-stat	Coeff	T-stat	Coeff	T-stat
Constant	-0.014	-0.856	-0.083	-2.388[b]	-0.015	-0.994	-0.019	-0.482
Event	0.007	1.158	0.008	1.386	-0.021	-2.337[b]	-0.021	-1.746[c]
Comprehensive credit rating (lagged)	0.001	1.214	0.001	0.568	0.002	1.809[c]	0.002	1.179
Emerging			0.024	1.948[c]			0.011	0.535
Common law			0.012	1.205			-0.003	-0.223
Rule of law			0.007	1.294			-0.002	-0.377
GDP			0.000	0.532			0.000	1.121
Liquidity			-0.004	-0.792			0.004	1.021
Crisis			-0.007	-0.511			-0.003	-0.139
Year Dummies	no		yes		no		yes	
Adjusted R^2	0.002		0.000		0.005		0.023	
Observations	252		252		270		270	

Appendix I: Asymmetric effects of rating changes and corruption

This table presents the coefficient estimates from the following equation:

$$F6_{i,t} = \alpha + \beta_1 Event_{i,t} + \sum_k \beta_k X_k + \varepsilon_{i,t}, \forall i.$$

The dependent variable is the change in mutual fund asset allocation levels in country *i* (the event country) at time t. Here, we report flow measure *F6*, which assumes that the monthly flows are distributed in equal daily amounts. For each country with a rating event, we include in the regressions flows in event months, and flows in non-event months where there was no change in the comprehensive credit rating (event) for any of the countries in our sample. Corruption is an indicator that takes the value 1 if the country's corruption index is greater than 7.5 out of 10. The expected return for a country index (used in constructing the flow measure) is based on a single-factor market model regression of the index returns of a country on the returns on a world index during an estimation period of 60 months, i.e., from [-65,-6] where month 0 represents an event month. *Event* is defined as the absolute change (from the previous month) in the comprehensive credit rating in country *i*. A positive rating event is defined as an increase in the comprehensive credit rating, and a negative rating event occurs whenever the comprehensive credit rating declines from the prior month. Regressions include variables for lagged flow measure *F6*, the lagged comprehensive credit rating, country status as emerging/developed, origin of legal system (i.e., common law versus other forms), rule of law, GDP, liquidity, an interactive variable formed from the Corruption and Event variables, and an indicator variable corresponding to crisis periods. See Appendices E and F for a complete description of variable construction. The superscripts a, b, and c, indicate statistical significance at the 1%, 5%, and 10% levels using robust standard errors in a two-tailed test.

	Positive rating events				Negative rating events			
	(1)		(2)		(3)		(4)	
	Coeff	T-stat	Coeff	T-stat	Coeff	T-stat	Coeff	T-stat
Constant	-29.666	-0.199	-23.731	-0.158	320.876	1.902[c]	258.603	1.437
Event	-4.896	-0.221	-5.279	-0.239	-89.298	-3.269[a]	-89.138	-3.282[a]
Comprehensive credit rating (lagged)	1.603	0.176	1.627	0.179	-1.027	-0.150	-1.430	-0.211
Lagged Flow *($F6_{t-1}$)*	-0.085	-0.534	-0.084	-0.531	0.262	3.382[a]	0.260	3.366[a]
Emerging	37.816	0.549	24.783	0.360	-264.946	-2.283[b]	-200.633	-1.610
Common law	-46.444	-0.615	-35.701	-0.535	-23.997	-0.381	-29.026	-0.470
Rule of law	6.135	0.338	7.780	0.435	7.941	0.462	7.871	0.458
GDP	0.224	1.095	0.232	1.133	-0.001	-0.011	0.014	0.280
Corruption	58.572	0.574			-112.905	-1.018		
Corruption x Event	-27.307	-0.107	3.799	0.015	244.276	2.033[b]	210.220	1.776[c]
Liquidity	106.006	1.851[c]	104.091	1.816[c]	54.697	1.085	55.318	1.100
Crisis	40.369	0.616	40.704	0.622	-103.963	-0.991	-102.845	-0.978
Year Dummies	yes		yes		yes		yes	
Adjusted R^2	0.018		0.022		0.202		0.203	
Observations	240		240		253		253	

Appendix J: Non-event country effects and corruption

This table presents the coefficient estimates from the following equation:

$$F6_{j,t} = \alpha + \beta_1 Event_t + \sum_k \beta_k X_k + \varepsilon_{j,t}, \forall j.$$

The dependent variable is the change in mutual fund asset allocation levels in country *j* (a non-event country) in month *t* with rating changes in event countries. Here, we report flow measure *F6*, which assumes that the monthly flows are distributed in equal daily amounts. For each rating event, we include in the regressions flows in the event months, and flows in non-event months. Corruption is an indicator that takes the value 1 if the country's corruption index is greater than 7.5 out of 10. The expected return for a country index (used in constructing the flow measure) is based on a single-factor market model regression of the index returns of a country on the returns on a world index during an estimation period of 60 months, i.e., from [-65,-6] where month 0 represents an event month. *Event* is defined as the absolute aggregate change (from the previous month) in the comprehensive credit rating across all event countries $i (\neq j)$. A positive rating event is defined as one if the aggregate ratings change is positive (and zero otherwise), and a negative rating event is defined as one if the aggregate ratings change is negative (and zero otherwise). Regressions include variables for lagged flow measure *F6*, the lagged comprehensive credit rating, country status as emerging/developed, origin of legal system (i.e., common law versus other forms), rule of law, GDP, corruption, liquidity, an interactive variable formed from the Corruption and Event variables, and an indicator variable corresponding to crisis periods. See Appendices E and F for a complete description of variable construction. The superscripts a, b, and c, indicate statistical significance at the 1%, 5%, and 10% levels using robust standard errors in a two-tailed test.

	Positive rating events				Negative rating events			
	(1)		(2)		(3)		(4)	
	Coeff	T-stat	Coeff	T-stat	Coeff	T-stat	Coeff	T-stat
Constant	-27.669	-0.611	-10.076	-0.226	42.370	0.701	36.481	0.634
Event	3.618	0.655	1.708	0.313	5.368	1.105	6.053	1.257
Comprehensive credit rating (lagged)	-1.831	-0.725	-1.452	-0.575	-0.666	-0.218	-0.742	-0.241
Lagged Flow *($F6_{t-1}$)*	0.042	0.664	0.041	0.656	0.116	2.002[b]	0.116	1.992[b]
Emerging	67.662	2.165[b]	45.319	1.532	33.379	0.740	40.928	1.052
Common law	-32.991	-1.336	-20.773	-0.878	-51.838	-1.898[c]	-56.424	-2.389[b]
Rule of law	2.339	0.380	4.017	0.666	-6.272	-0.832	-6.975	-0.959
GDP	-0.011	-0.783	-0.010	-0.746	-0.008	-0.526	-0.008	-0.521
Corruption	92.006	2.144[b]			-34.935	-0.658		
Corruption x Event	-10.852	-0.817	4.952	0.431	26.639	2.090[b]	20.238	1.745[c]
Liquidity	-9.309	-0.434	-10.444	-0.489	7.123	0.358	7.529	0.378
Crisis	95.113	4.236[a]	94.829	4.216[a]	6.883	0.265	6.095	0.235
Year Dummies	yes		yes		yes		yes	
Adjusted R^2	0.037		0.034		0.055		0.056	
Observations	1352		1352		1356		1356	

Figure 1: Sovereign Ratings Activity
(Number of ratings changes across all countries, by period)

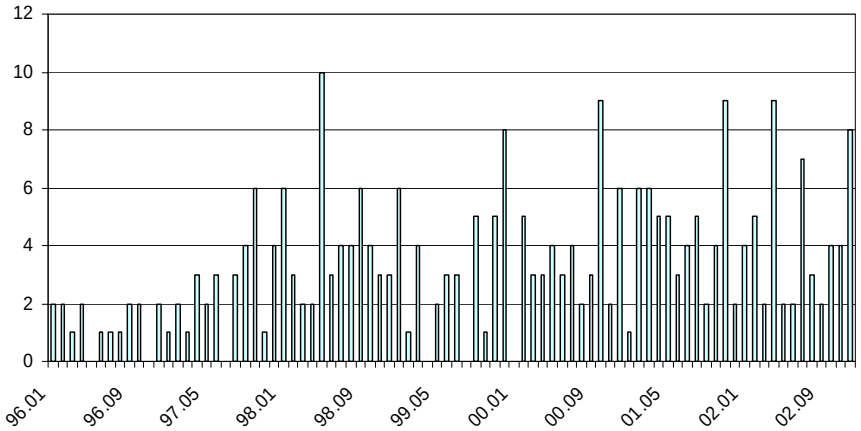

Figure 2: Positive Sovereign Ratings Activity
(Number of ratings changes across all countries, by period)

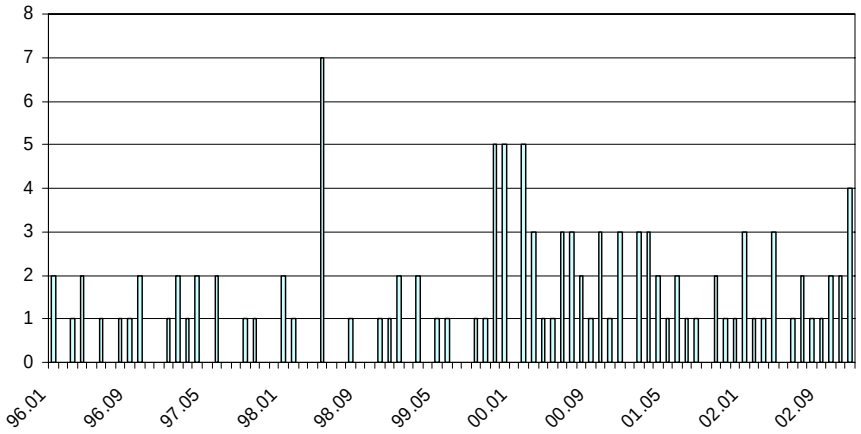

Figure 3: Negative Sovereign Ratings Activity
(Number of ratings changes across all countries, by period)

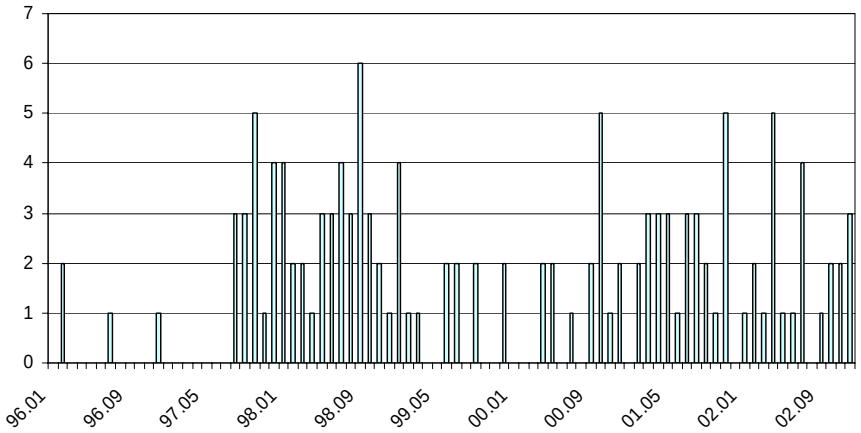

Figure 4: Cumulative average abnormal returns of country index due to a positive ratings change

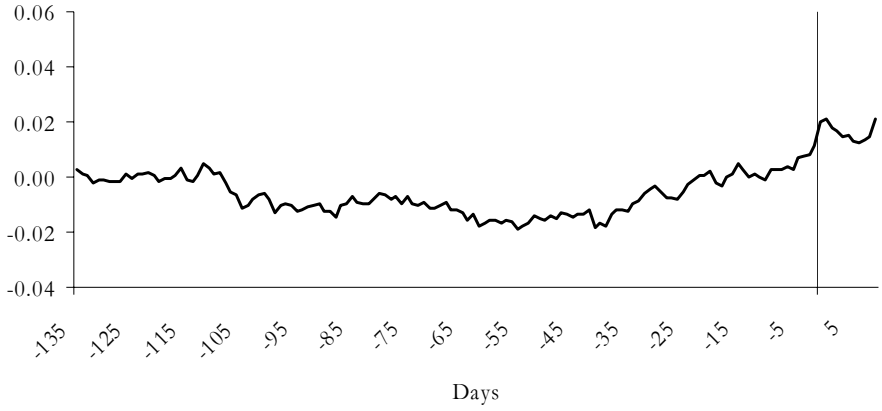

Figure 5: Cumulative average abnormal returns of country index due to a negative ratings change