Transparency and International Investor Behavior

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This version: June 20, 2003

Abstract

Does country transparency affect international portfolio investment? We examine this and related questions using new measures of transparency and a unique micro dataset on international portfolio holdings of emerging market funds. We distinguish between government and corporate transparency. There is clear evidence that funds invest systematically less in less transparent countries. Herding among funds tends to be more prevalent in less transparent markets. Funds seem to react less strongly to macroeconomic news about opaque countries. There is also some evidence that during crises, funds flee non-transparent countries to a greater extent.

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1. Introduction

In policy circles, lack of transparency has frequently been blamed for the recent financial crises in emerging markets. For example, the IMF (2001) notes that a "lack of transparency was a feature of the buildup to the Mexican crisis of 1994–95 and of the emerging market crises of 1997–98," stating that "inadequate economic data, hidden weaknesses in financial systems, and a lack of clarity about government policies and policy formulation contributed to a loss of confidence that ultimately threatened to undermine global stability." Consequently, the international financial institutions have actively promoted more transparency among their member countries as well as made strides to become more transparent in their own operations.

The strive for more transparency presupposes that destabilizing behavior by individual investors can be avoided or attenuated by improved provision of information. For example, international investment funds may be more likely to engage in herding in less transparent countries (where herding is defined as funds taking investment decisions which they would not take if they did not observe other funds taking them). As a result, investors may rush in and out of countries even in the absence of substantial news about fundamentals.

In theory, however, it is controversial whether lower country transparency yields higher herding or volatility. On the one hand, one set of theoretical explanations of herding behavior relies on asymmetric information (e.g., Banerjee, 1992, Bikhchandani et al., 1992; Welch, 1992) about fundamentals.[2] There is a natural linkage between low transparency and asymmetry of information. Low transparency typically does not mean that no one knows anything. Rather, lower transparency means that less information is made publicly available, which in turn implies that the gap between those who know and those who do not is larger. Such higher informational asymmetry should therefore result in more herding.

On the other hand, herding by institutional investors can be rationalized without an appeal to informational asymmetry about country fundamentals, but instead by the incentives faced by fund managers that result from the need to have their performances compared

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[2] See Devenow and Welch (1996) and Bikhchandani and Sharma (2001) for surveys.

periodically with a common benchmark (Maug and Naik, 1996; and Zwiebel, 1995)[3]. In this case, an improvement in a country's transparency would not imply a reduction in international investors' herding behavior.

Related to this discussion, the theoretical link between availability of information and market volatility is ambiguous, as pointed out, among others, by Furman and Stiglitz (1998). While their argument is not specifically about herding behavior, it is about investors' trading behavior in different information environments. In particular, they suggest that if more transparency means a higher frequency of information release (holding the true value of the fundamental constant), price volatility could increase rather than decline.[4] The notion that transparency may not necessarily reduce volatility is reflected in the literature on corporate transparency. In particular, Bushee and Noe (2000) report a positive association between corporate transparency and the volatility of the firm's stock price. Firms with higher levels of disclosure tend to attract certain types of institutional investors, which use aggressive, short-term trading strategies which in turn can raise the volatility of the firm's stock price. It is not clear whether this investor self-selection story can be generalized to the international context.

To summarize, logically, the connection between transparency and herding is ambiguous, depending on which force articulated in theory dominates. In this sense, the effect of transparency on the behavior of international investors is ultimately an empirical question.

International evidence on this issue, however, is still lacking. To be sure, there are several empirical studies that measure the degree of herding among funds, including Lakonishok, Shleifer and Vishny (1992), Grinblatt, Titman and Wermers (1995), and Wermers (1999) for the U.S., Choe, Kho and Stulz (1999) and Kim and Wei (2002a and 2002b) for Korea, and Borensztein and Gelos (forthcoming) for emerging markets worldwide. However, as far as we

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[3] Admati and Pfleiderer (1997) show that in a model with multiple risky assets, benchmark-based compensation contracts are inefficient. More generally, there is a class of herding models pioneered by Scharfstein and Stein (1990) that stresses imperfect information about managers' ability; the resulting reputational concerns of fund managers induce them to mimic their peers.

[4] See also Geraats (2002).

know, there is no paper that studies the connection between a country's level of transparency and the degree of herding by international investors[5].

Transparency may also affect the <u>level</u> of international portfolio investment in addition to its effect on herding. On this, there is less disagreement in the existing literature. In the corporate finance context, Diamond and Verrechia (1991), among others, have argued that a reduction in informational asymmetry can increase the investment from large investors and hence reduce the cost of capital for the firm (see Healy and Palepu, 2001, and Core, 2001, for reviews of the empirical literature on corporate disclosure). A class of insider trading models suggests that "outsiders" will reduce their investment if they expect "insiders" to take advantage of them in trading (Ausubel, 1990). So far, there is no theoretical paper that has modeled explicitly the effect of a country's transparency on the level of international portfolio investment.[6] However, it seems reasonable to extrapolate from the corporate finance literature that an improvement in a country's transparency can be expected to lead to an increase in the level of investment by international mutual funds.[7]

We aim to accomplish two main objectives in this paper. First, we investigate the effect of transparency in developing countries on the <u>level</u> of investment by international institutional

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[5] There is an empirical literature that documents the existence of a "home bias" – the tendency for investors to invest less in foreign equities relative to the prediction of a portfolio choice model (see, among many others, French and Poterba, 1991, and Tesar and Werner, 1995). Informational asymmetry between domestic and foreign investors has been hypothesized to be a factor in explaining this (Stulz, 1981, Ahearne, Griever, and Warnock, 2001). However, as far as we know, there is no paper that uses an explicit measure of the degree of information asymmetry/non-transparency and that links it to the extent of under-investment by investors worldwide.

[6] A number of fundamental issues on the effects of transparency are nicely discussed in Geraats (2002).

[7] There are several somewhat related empirical papers which we cannot survey completely here. Portes and Rey (1999) examine the role of information in explaining cross-border volume of equity flows, though they do not look at any measure of transparency at the country level. Wei (2000) studies the effect of corruption on inward foreign direct investment and bank borrowing,. Using data on U.S. holdings of equities, Ahearne, Griever, and Warnock (2000) examine how informational asymmetries affect the home bias. Morck, Yeung, and Yu (2000) relate the comovement among stocks in different countries to the protection of property rights.

investors. Second, we examine the effect of transparency on the degree of <u>herding</u> among funds, as well as related issues. To our knowledge, this is the first paper in the literature that examines the linkage between herding behavior and country characteristics, especially transparency.[8]

Apart from the novelty of the questions examined, two important features of the paper are the construction of transparency measures and the use of a unique micro investment data set containing the country allocation of over 300 emerging market funds at a monthly frequency over 1996-2000. The investment information at the individual fund level allows us to measure herding behavior, which is not possible with aggregate data.

The assembly of the transparency measures may be a contribution of this paper by itself. We distinguish between government and corporate transparency. Within the category of government transparency, we further differentiate between macroeconomic data availability (timeliness and frequency) and transparency in the conduct of macroeconomic policies. Corporate transparency refers to availability of financial and other business information about firms in a country. It turns out that each measure contains information not captured by the other ones[9]. For example, the correlation between corporate transparency and government data transparency is 0.02, and the correlation between corporate and government macropolicy transparency is 0.54.

The main findings of the paper can be summarized here. First, there is relatively clear evidence that low transparency – or high opacity – in an emerging market tends to reduce the level of investment by international funds in that market. Government opacity and corporate opacity have separate, depressing effects on investment. Second, there is a moderate amount of

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[8] Our research pertains to a broader literature that examines the effects of institutions on economic outcomes. See, for example, Acemoglu, Johnson, and Robinson (2001) for the effect of colonization on growth and La Porta, López de Silanes, Shleifer, and Vishny (1997, 1998) for the importance of legal systems for financial development. One open question concerns the channels through which these institutional effects work, and transparency may be regarded as one particular channel.

[9] Note that we do not focus on corruption, the rule of law, or specific corporate governance aspects, such as the degree of minority shareholder protection in this paper. Rather, we try to capture as accurately as possible the notion of information quality and availability.

evidence that low transparency leads to an increase in the herding behavior by international investors. Thus, if herding by international investors contributes to higher volatility or more frequent financial crises in emerging markets, our results suggest that countries may at least partly protect against such volatility by becoming more transparent. In addition, there is some evidence that funds react less strongly to news about fundamentals in less transparent countries. Furthermore, during crises, funds tend to reallocate their assets from less to more transparent countries.

2. Data

Two sets of variables are crucial for our analysis. The first is a data set on investment positions by individual international funds in various countries. The second set is related to various measures of transparency. We explain the two sets of data in turn.

2.1. Data on Emerging Market Funds

We use data from a comprehensive database purchased from eMergingPortfolio.com (formerly Emerging Market Funds Research, Inc.). The database covers, on a monthly basis, the country asset allocation of hundreds of equity funds, a few of which have a global investment strategy, but most of which have a focus on emerging markets. The period covered is January 1996–December 2000. At the beginning of the sample, the database contains 382 funds with assets totaling US$117 billion; at the end of 2000, the number of funds covered is 639, managing US$120 billion. Approximately one quarter of the funds are closed-end funds. The funds are domiciled mostly in advanced economies and offshore banking centers. We exclude single-country funds.

In February 1999, the sample consisted of 9 international funds (not exclusively focusing on emerging markets), 53 global emerging market funds, 125 Asian regional funds, 52 regional Latin American funds, and 39 funds focusing on other geographic areas. Approximately one quarter of the funds are closed-end funds. The assets of these funds represent a modest, but not

negligible fraction of the total market capitalization. For example, in the case of Argentina, funds held approximately 6.5 percent of the total stock market capitalization in August of 1998, while the share was around 4.5 percent for Hungary and Korea.

The data set provides asset positions in each country at a given point in time (month end). Since in some instances, we are interested in the *flows* to individual countries, we infer their values from the asset position data under some assumptions on changes in the stock valuation. In particular, we assume that in any given country, the funds hold that country's index (or, more precisely, a portfolio of stocks that is well approximated by the IFC investable index.[10] We assume that flows occur halfway through the period. For investment flow from fund *i* to country *c* in month *t* we assume that:

$$\text{Flow}_{cit} = [\text{Assets}_{i,c,t} - \text{Assets}_{i,c,t-1} \, (1+ \text{Index return}_{ct})] / (1+ \text{Index return}_{ct})^{1/2} \qquad (1)$$

Consistency checks for closed-end funds show that our approximation is reasonable.[11]

2.2. Measuring (Lack of) Transparency

In this paper, we use the term transparency to denote the availability and quality of information, measured at the country level. In particular, we focus on two categories of opacity: governmental and corporate. Within the category of government opacity, we construct separate measures for opacity in macroeconomic policies and opacity in the availability of macroeconomic information. For corporate opacity, we work with an index of availability and reliability of corporate accounting information. In addition, we use a new composite index of opacity intended to combine information about opacity in accounting, regulation, the legal

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[10] Where the IFC does not compute an investable index, we used the global index. For countries not covered by the IFC, we employed MSCI US dollar index data or national indices converted into U.S. dollars.

[11] The correlation between imputed and actual changes in total assets is 0.93.

system, economic policy, and bureaucratic corruption. This index potentially crosses the distinction between government and corporate opacity.

Government Opacity

On government transparency, we look into two separate aspects. The first concerns the transparency and predictability of a government's macroeconomic policies, and the second concerns the frequency and timeliness of government information release.

We construct a measure of macro policy opacity based on two measures developed by Oxford Analytica for Wilshire Associates. Oxford Analytica produced detailed reports for 27 countries, based on which it assigned scores to fiscal and monetary policy. For about half of the countries, Oxford Analytica relied heavily on the recent "Reports on Standards and Codes" (ROSCs) produced by the IMF. Because the ratings are largely based on the degree to which a government's conduct of macro policies conforms with the prescribed standards and codes rather than realized values of inflation or fiscal deficits, they have, in principle, been filtered by the impact of shocks to an economy. We use the sum of these scores, subtract it from ten, and label this variable **MACROPOLICY OPACITY** (See Appendix I).

We construct a measure of macro data opacity based on two indices developed by the IMF on the frequency and timeliness of national authorities' macroeconomic data dissemination for all its member countries. The indices are available for 1996, 1997 and 2000 (Allum and Agça, 2001). We subtract these values from ten, construct a simple average of the two variables for each year and call it **MACRODATA OPACITY**. For the years 1998 and 1999, we use the values from 1997. One should keep in mind that this particular measure captures frequency and timeliness of information release, but not necessarily accuracy or quality of the data.

Corporate Opacity

The yearly Global Competitiveness Report produced by the World Economic Forum used to include results from surveys about the level of financial disclosure and availability of information about companies. Based on these results, we construct a summary variable called **CORPORATE OPACITY** (further details are given in Appendix I). This gives us a one-time cross-country measure of average opacity in the corporate sector.

Composite Opacity

The accountancy and consulting company PriceWaterhouseCoopers (PwC) conducted a survey of banks, firms, equity analysts, and in-country staff in 2000 to generate measures of opacity in five areas (PriceWaterhouseCoopers, 2001): bureaucratic practices (corruption), legal system, government macroeconomic policies, accounting standards and practices, and regulatory regime. Following PwC, we call this variable **O-FACTOR**.

Correlation Among the Opacity Measures

The different measures of opacity indeed appear to capture different aspects of country opacity: the correlation among them is positive but far from perfect (Table 1).[12] The overall measures OFACTOR is strongly correlated with CORPORATE OPACITY (correlation coefficient =0.69), and the correlations between MACROPOLICY OPACITY and MACRODATA OPACITY is also quite high (0.63). The relation between CORPORATE OPACITY and OFACTOR on the one hand and the macroeconomic opacity measures on the other hand is low. To highlight that the opacity measures capture something different than just economic development, the table also shows the correlation of the opacity indices with GDP per capita. The correlation of OFACTOR and CORPORATE OPACITY with GDP per capita is statistically significant but far from perfect.

3. Empirical Results

3.1 Transparency and Country Asset Allocation

In this sub-section, we assess whether global and emerging market funds tend to allocate less money to less transparent countries. To do this, we need a benchmark on how international mutual funds would invest if all countries were equal on the transparency dimension. We take as our guidance the International Capital Asset Pricing Model, which predicts that international

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[12] A list of countries in our sample and their associated opacity measures are given in Table A1.

mutual funds should hold each country's asset in proportion to its share in the world market portfolio.[13] As an empirical proxy for the world market portfolio, we choose the popular MSCI Emerging Markets Free (EMF) Index produced by Morgan Stanley. The index is essentially based on the market capitalization of a country's stocks that is available to foreign investors, capturing the effect of restrictions on foreign ownership. It is common for asset managers to report their positions relative this index and for investment banks to issue recommendations relative to it (e.g., "over-weight South Africa" means "advisable to invest more than South Africa's weight in the MSCI EMF index"). Indeed, Disyatat and Gelos (2001) report evidence that the country allocation of dedicated emerging market funds can, to a large extent, be explained by the MSCI EMF index. Therefore, this is a natural benchmark to use.

The empirical strategy in this paper is to examine whether a country's empirical measure of opacity helps to explain mutual funds' investment position after we take into account the country's share in the MSCI EMF index. (We will also add other control variables later on.) To be more precise, we regress the actual country weights on benchmark index weights and measures of transparency. The EMF index includes only investment opportunities available to the international investor. The regressions are of the form:

$$w_{i,j,t} = \alpha_j + \beta \cdot w_{i,t}^{benchmark} + \gamma \cdot OpacityIndex_{i,t} + \varepsilon_{it} \qquad (2)$$

where $w_{i,j,t}$ denotes the weight of country i in fund j's portfolio at the end of period t and α_j is a fund fixed effect. The right-hand side variables do not vary with the fund dimension j. For this reason, we allow for clustering of the errors around the j dimension to avoid artificially inflated t-statistics.[14] The coefficient on *OpacityIndex* would be negative if global and emerging markets funds systematically invested less in less transparent countries.

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[13] Estimating an explicit portfolio choice model is not trivial since it requires knowledge about expected moments. Disyatat and Gelos (2001) discuss this and show that using historical returns to model expected returns is not appropriate in this context.

[14] See Rogers (1993). A less efficient alternative is to simply form averages by fund and allowing for serial correlation by country, and we obtain very similar results when proceeding this way. A related problem concerns the estimation of the effect of aggregate variables on micro data, since it requires awareness that errors are likely to be correlated within the groups formed

There are two things worth noting at the outset. First, the total market capitalization in any country must be held in the aggregate by some investors. In other words, not all investors can be "underweight" in less transparent countries. Therefore, our empirical investigation concerns whether and how the level of foreign investment *relative to domestic investment* is affected by opacity. Second, here we ignore any effect of transparency on a country's share in the MSCI EMF index itself. It seems plausible that less transparency would inhibit the development of a country's financial market, an issue we do not examine in this paper. To the extent that this is true, our estimates may underestimate the true negative effect of opacity on the level of international investment. Note, however, as long as the opacity measure is uncorrelated with the error term in the regressions, its coefficient estimate are still consistent albeit less precise if opacity is correlated with the share in the EMF index.[15]

The regression results are reported in Table 2. Without exception, lack of transparency in a country is associated with less investment by international funds. The overall opacity index (the O-factor) and all three other indices of corruption are statistically significantly and negatively correlated with country weights.[16] Quantitatively, the estimated effect of opacity on international investment is moderate but not trivial. For example, the estimate using OFACTOR

by the aggregate variables (see Moulton, 1986). Aggregating by funds obviously solves this problem. Alternatively, we allow for clustering of the errors for each country-month group, and the effect of the transparency variables remains statistically significant.

[15] A similar issue is related to the role of American Depositary Receipts (ADRs) or Global Depositary Recepits (GDRs) traded in advanced markets. Firms in less transparent countries may be more inclined to choose to issue ADRs or GDRs. If this is the case, this will make it more difficult for us to find any effects of transparency on the investment behavior of funds. (Note that purchases of ADRs show up in our data in the same way as regular equity purchases, i.e. as an increase in a fund's assets in that country.) In separate regressions (not shown), we include the volume of ADRs as a fraction of total market capitalization in our regressions. This fraction has a positive, statistically significant effect on holdings but does not materially change the coefficients on our opacity indices. When including an additional interaction term of the ADR fraction with opacity, its coefficient is negative: this means that in more opaque countries, ADRs matter more. We are grateful to Graciela Kaminsky and Leora Klapper for discussions on this issue and to Sergio Schmukler for providing us with data on ADRs.

[16] Ahearne, Griever, and Warnock (2000) find that an interaction variable of an index measuring rule of law and an index measuring accounting standards contributes to explaining U.S. holdings of foreign equities.

as the opacity measure suggests that a country like Venezuela, currently represented with an average 0.4 percent weight in the sample's portfolios, could achieve a 1.7 average higher percentage weight in fund portfolios if it increased its transparency to Singapore's level.[17]

While we believe that the MSCI EMF index provides a good benchmark for our analysis, other factors might be relevant in determining the country allocation of funds' assets. Therefore, we make an attempt to control for many other factors that might be suspected of being correlated with opacity.[18] (1) Funds might prefer to be overweight in more liquid markets, and transparency measures might be proxying for market liquidity. Therefore, we include average turnover (average monthly value traded divided by mean market capitalization) as an additional variable. (2) Fund managers could prefer countries with strong protection of minority shareholders, and transparency might pick up this effect. Therefore, we include the summary variable on minority shareholder rights constructed by La Porta, López de Silanes, Shleifer, and Vishny (1998) and extended by Pistor, Raiser and Gelfer (2000) for transition economies in the regressions. (3) Countries classified by us as less transparent may be countries with closely held stock ownership. Dahlquist, Pinkowitz, Stulz, and Williamson (2002) point out that only a fraction of the market capitalization in most countries is available to international investors who are not controlling shareholders. They compute the percentage of firms closely held for many countries, and show that home bias by U.S. investors can largely be explained by this effect. We include their measure of closely held shares in our regressions. (4) One may also suspect that our opacity measures are likely to capture other factors associated with economic development, not necessarily market opacity. For this reason—although there is no clear justification for doing so—we also include GDP per capita as an additional explanatory variable. (5) Opacity indices

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[17] The effect of opacity may depend on the size of the market. We also ran regressions using the percentage deviations from benchmark weights as the independent variable, with similar results. Alternatively, we included an interaction term of the benchmark weight (a measure of market size) and our opacity indices. The coefficient was positive, indicating that the effect of opacity is stronger for smaller countries.

[18] The MSCI index weights themselves may be a function of opacity: when a market becomes more transparent, it may grow and increase its weight in the index. If this were the case, it would make it harder to find any significant effects of opacity.

may be capturing country risks more broadly rather than those specifically associated with lack of transparency. We therefore include monthly summary risk variables for economic, financial, and political risk produced by International Country Risk Guide.[19] Note that this in some sense represents an "overcorrection," since the political risk measure captures some country characteristics that are related to transparency—in fact these variables have occasionally been used to measure transparency.[20] We also include a three-year moving average of mean returns to capture the possibility that fund managers are return chasing. We allow for the effect of opacity to vary between tranquil and crises times.[21]

When including these control variables, all opacity variables continue to have negative and statistically significant coefficients, with their magnitude broadly unchanged (Table 3). Interestingly, during crises, the effect of opacity becomes *less* important. This possibly reflects panic selling across all emerging markets during a crisis when the distinction among countries in terms of opacity becomes less important. In any case, the negative effect of opacity on international investment (reported in Table 2) is not driven by crisis episodes in the sample. The coefficients on the other control variables mostly, though not always, have the expected signs and are often statistically significant.

Lastly, exchange rate regimes might potentially be correlated with opacity and fund managers may have a preference for certain types of exchange rate arrangements. To capture this explicitly, we include monthly dummies for five different types of exchange rate regimes based on recent work by Reinhart and Rogoff (2002). Table 4 adds these variables describing the features of a country's exchange rate regime to the list of control variables. We see that each of the opacity variable continues to be negative and statistically significant. Concerning exchange

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[19] For details, see Appendix B. Note that the ICRG variables have been used in the finance literature to derive expected returns. See Erb, Harvey, and Viskanta (1996).

[20] See Furman and Stiglitz (1998).

[21] We interacted the opacity variable with a crisis dummy, which was set equal to one for the period of the Asian, Russian, and Brazilian crises (97:07-98:01, 98:07-98:09, 99:01).

rate regimes, funds appear to have a "fear of floating," in the sense that they invest less in countries with a freely floating regime, other things being equal.[22]

A potential problem is that some of our opacity measures were constructed toward the end or even after the sample period. Increases in mutual fund investment themeselves may potentially trigger reforms toward more transparency.[23] We therefore also use an earlier measure of corporate opacity, namely the accounting standard variable proposed by La Porta, Lopez-de-Silanes, Shleifer, and Vishny (1998).[24] The measure was published in 1991, and for Indonesia and Pakistan we use values published in 1993 following Doidge, Karolyi and Stulz (2002), and therefore predetermined. We find that the degree of accounting opacity has a significant negative effect on holdings, with coefficients ranging from -0.025 (t-statistic: -4.06) in the simple regression to -0.034 (t-statistic: -3.68) in a regression including control variables (as in Table 4).

Robustness to outliers and to gradation of the opacity measures

To further examine the robustness of this finding to possible presence of outliers and to the sensitivity to using a less rigid gradation of the transparency measures, we adopt a simple two-step semi-parametric approach. In the first step, we classify all countries into a low-opacity group and another high-opacity group, depending on whether their opacity values are below or above the median. In the second step, for each group, we compute the difference between the actual weight by an investment fund in a country and the benchmark weight indicated by the MSCI index, averaged over all global and emerging market funds in our sample. Since every country is classified either as a high-opacity or a low-opacity one, the exact values of the opacity measures are not so important. In addition, the effect of any outlier from any particular fund or country on the inference would also be minimal in this setting.

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[22] Calvo and Reinhart (2002) show that governments suffer from a "fear of floating."

[23] See Kaminsky and Schmukler (2003) for a discussion of the sequencing of institutional reforms and financial liberalization.

[24] To be consistent with our other measures, we subtract the original variable from 100, so that higher levels denote higher accounting opacity.

The results are reported in Table 5. As one can see, international funds, on average, invest more in transparent countries and less in opaque countries than their respective MSCI benchmarks. The differences in portfolio weights between these two groups of countries are always statistically significant no matter which measure of opacity is used.

A Horse Race Among Different Transparency Dimensions

What is the relative importance of these dimensions of transparency? To assess this question, we run a simple "horserace" between our measures, including them jointly in regressions (Table 6). We do not include OFACTOR since it is a summary variable encompassing both corporate and macroeconomic transparency. When we do not include control variables except for the benchmark index weights (as in Table 2), the coefficients on each of the three opacity measures retain their approximate size and significance, while the government transparency variables become statistically insignificant. By contrast, when including control variables (as in Table 3), the coefficients become much larger in (absolute) size, with the coefficient on MACRODATA OPACITY turning positive. We therefore tentatively conclude that at least corporate opacity and macropolicy opacity separately contribute to a reduction in international investment.

3.2. The Effect of Transparency on Investors' Herding Behavior

Is herding more or less prevalent in less transparent countries? To measure the extent of
herding behavior, we compute a statistic of trading co-movement originally introduced by
Lakonishok, Shleifer, and Vishny (1992).[25] The measure allows us to assess whether funds move
in the same direction more often than one would expect if they traded independently and
randomly. The indicator, denoted HM (for herding measure), is given by:

$$HM_{it} = |p_{it}-E[p_{it}]| - E|p_{it}-E[p_{it}]|, \qquad (3)$$

where p_{it} is the proportion of all funds active in country i in month t that are buyers:

$$p_{it} = \frac{\#ofBuyers(i,t)}{\#ofBuyers(i,t)+\#ofSellers(i,t)}, \qquad (4)$$

and $E[p_{it}]$ is its expected value. By taking the absolute value, the first term in equation (3)
captures imbalances in both directions, buying or selling.

The expected fraction of buyers $E[p_{it}]$ may vary over time—for example, there might be
periods of large inflows into emerging market funds, during which we would observe most funds
buying contemporaneously. We approximate $E[p_{it}]$ by the total number of net buyers across all
countries divided by the total number of active funds in that month:

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[25] Borensztein and Gelos (forthcoming) compute and discuss herding among the funds examined
here. They find moderate, but statistically significant evidence for herding. The mean of HM
across countries and over time is 7.7 percent, about twice as large as the number found for
domestic U.S. institutional investors. See Choe, Kho, and Stulz (1999) and Kim and Wei (2002a)
for evidence of herding among international investors in Korea.

$$E[p_{it}] = \frac{\sum_{i=1}^{N} \# Buyers(i,t)}{\sum_{i=1}^{N} \# Buyers(i,t) + \# Sellers(i,t)} \tag{5}$$

Since the distribution of the absolute value of the first expression is not centered around zero, the expected value $E|p_{it}-E[p_{it}]|$ needs to be subtracted. Under the null hypothesis of no herding, this expected value is calculated assuming that the number of buyers follows a binomial distribution.

Not all investors can trade in the same way since for every "buy," there must be a "sell." Therefore, herding can only be meaningfully defined for a subset of investors. Here, the group of international investment funds constitutes an economically meaningful subset of investors.

It is also important to note that the statistical measure in Equation (3) effectively captures the extent of correlation in trade by different investment funds, whose existence is a necessary condition for the presence of herding in an economic sense. Correlated trading, however, is not a sufficient condition for herding. In other words, a high value in the statistical measure of Equation (3) does not preclude the possibility that all (or most) funds simply respond in a similar way to the arrival of some common information even if they do not engage in herding in the true meaning of the word. We note that a statistical measure of herding that corresponds exactly to its economic concept does not yet exist.

On the other hand, Kim and Wei (2002a) examined whether herding by international investors is *ex post* profitable in the context of the Korean market. More concretely, if a high value in the statistical measure of herding is simply a refection of a common reaction by international funds to useful fundamental information, and the information is payoff-relevant, one might think that those stocks that funds herd to buy (or sell) would subsequently appreciate (or depreciate) more than the rest of the market, other things equal. Kim and Wei (2002a) tested this proposition and found no support for it. In other words, using *ex post* profitability as a criterion, they concluded that, at least in their sample, the correlation in trading as measured by Equation (3) is unlikely to be driven primarily by common reaction by international investors to useful information about underlying fundamentals.

We compute averages of HM_{it} for each country over the 60 periods. To include only meaningful notions of "herds," we include only observations with at least five active funds. Moreover, to limit the impact of approximation errors, we classify a fund as buyer or seller only if the absolute value of the calculated (out-) flow into (or from) a country is larger than three percent of the fund's assets in that country. We then examine correlations between herding and country transparency. To our knowledge, this is the first attempt in the literature to relate the degree of herding to country characteristics rather than investors.

Herding is somewhat higher in less transparent countries, but this relation is not consistent across herding indices. Mean herding values are higher for more opaque countries, but the difference is only significant at the 5 percent level for OFACTOR and MACROPOLICY OPACITY (Table 7). Figure 2 shows the simple, unconditional relation between HM and OFACTOR.

The results are similar when including control variables. We regress these herding averages on our country transparency indices, average turnover and average market capitalization (Table 9).[26] Mean turnover (defined as the country average of monthly value traded divided by market capitalization) should proxy for market liquidity. Herding strategies are likely to be easier to implement in more liquid markets, where the price impact of any trade is lower. Concerning market size, Borensztein and Gelos (forthcoming) report that herding is more pronounced in larger markets, and we therefore include size as a control variable in these simple regressions. The coefficients on two transparency measures, namely OFACTOR, and CORPORATE OPACITY are significant at the five percent level. In some cases, the included variables explain a substantial fraction of the variation of herding across countries (the R^2's range from 0.01 to 0.3). When including GDP per capita as an additional regressor, only OFACTOR remains significant at the five percent level (CORPORATE OPACITY is still significant at the 10 percent level).

We again carried out a horserace between transparency measures (not shown to save space): since the number of observations shrinks to 23 while the number of explanatory variables

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[26] Wherever we have time variation in the transparency levels, we use simple averages of the variables.

increases, the estimates loose precision and none of the transparency indices remains significant at the 5 percent level.

Similarly to our finding on investment levels, the relation between the degree of herding and opacity appears to be weaker during crises. We computed the herding measure for only the crisis months mentioned earlier. In the regressions, none of the opacity variables was significant at the five percent level (not reported to save space).

3.3 The Reaction to News

An issue closely related to herding is the reaction of investors to news. Timely and comprehensive data dissemination by national authorities can help avoid situations in which any piece of bad news is potentially seen by foreign market participants as the tip of a hidden iceberg, with may cause panic.

Furman and Stiglitz (1998) argue that the mean of investors' expectations is unlikely to be affected by a lack of transparency. However, the variance of expectations across investors is likely to be higher due to opacity. Any information received might therefore have a larger effect on investors' beliefs.

On the other hand, news about more transparent countries will on average convey more useful information than news about opaque countries, so that markets may react more *strongly* to news in transparent markets. Core (2001) and Shu (2000) make this point in the context of corporate disclosure. This point can be seen clearly in a signal extraction framework[27]. Suppose that the realization of the fundamental x is composed of an average $\bar{x}$ and error term ε. Assume in addition that there is a public signal of x, $s = x + v$, where v is white noise. If ε and v are jointly normally distribution and the public does neither know ε nor v (but knows $\bar{x}$), then the best forecast of x conditional on the public signal s is:

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[27] The exact formulation of the signal extraction problem here follows Geraats (2002).

$$E(x \mid s) = \overline{x} + \frac{\sigma_\varepsilon^2}{\sigma_\varepsilon^2 + \sigma_\nu^2}(s - \overline{x}).$$ (6)

The sensitivity of the forecast of x to the signal s is increasing in the signal-to-noise ratio $\frac{\sigma_\varepsilon^2}{\sigma_\nu^2}$. In other words, if one interprets an increase in opacity as a decrease in the signal-to-noise ratio, then the expected fundamental conditional on signal $E(x|s)$ would be less sensitive to a given signal s.

A different argument is made by Brennan and Cao (1997). In their model, foreigners, who suffer from an informational disadvantage vis-à-vis domestic investors, will tend to revise the means of their distributions about fundamentals more strongly in reaction to to public signals than domestic investors. If these informational asymmetries between domestic and foreign investors are larger for more opaque countries, we should expect foreign investors to change their positions more strongly in response to public news about less transparent countries.

To assess whether funds react differently to news depending on the degree of country opacity, we relate changes in country portfolio weights to revisions in Consensus GDP forecasts (CONSNEWS).[28] First, we regress changes in portfolio weights on CONSNEWS and an interaction variable of CONSNEWS multiplied with the various transparency variables to assess the differential effect of opacity.[29] Since the news that we look at is macroeconomic in nature, we omit corporate opacity from this exercise. However, we do include control variables to assess the robustness of our results. The regressions are of the form:

$$\Delta w_{i,j,t} = \alpha \cdot CONSNEWS_{i,t} + \beta \cdot OpacityIndex \cdot CONSNEWS_{i,t} + \\ \gamma \cdot ControlVar \cdot \ CONSNEWS_{i,t} + \eta_j + \nu_i + \varepsilon_{i,j,t}$$ (7)

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[28] The surveys are published at the end of month in which they are conducted. We use a weighted average of current-year and year-ahead forecasts: in February, the current-year forecast is given a weight of 5/6, and next year's forecast a weight of 1/6, and so forth. We call the bimonthly difference between these forecasts CONSNEWS.

[29] Note that we do not include the opacity variable as a separate regressor, since opacity levels should not have an effect on changes in country weights.

where $\Delta w_{i,j,t}$ denotes the change of weight of country i in fund j's portfolio at the end of period t, η_j and v_i are fund and country fixed effects, and ε_{ijt} is an error term.

After controlling for other country variables, including risk factors, the results show that the reaction to news is more muted in more opaque countries (Table 9). The average reaction to news is significant but moderate: evaluated at mean values of the explanatory variables, an increase in the GDP forecast for a typical country increases funds' weight in that country from 4.7 percent to about 5.1 percent. The fact that the reaction to news is less strong in less transparent countries is consistent with the notion discussed earlier that a lower variance of the public signal should strengthen the reaction of expectations to a new public signal (GDP news).[30]

These result suggest that the signal-to-noise ratio regarding macroeconomic fundamentals is indeed lower in more opaque countries. Accordingly, after the release of macroeconomic news, fund managers may want to wait for further confirmation before engaging in a costly reallocation of assets across countries.

3.4 Flows during crises

While the overall relation between herding and opacity is of interest, a more specific question concerns the extent to which difference in opacity helps to explains which countries are more likely to be hit by outflows during crises. Are more opaque countries more prone to contagion effects? Do transparency measures, beyond and above macroeconomic indicators, explain the degree of confidence loss across countries during turbulent times?

Johnson and others (2000) have examined whether measures of corporate governance, in particular the protection of minority shareholder rights, help explain the extent of currency depreciation and stock market decline across countries during the Asian crisis. They find that corporate governance variables can account for a larger fraction of the variation in performance

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[30] A horserace among MACROPOLICY OPACITY and MACRODATA OPACITY (Table 10) indicates that both opacity aspects matter and that the quantitative effect of (proportional) changes in both indices on the reaction to news is quantitatively similar.

than standard macroeconomic variables. The fact that their regressions contain only 25 observations, however, limits inference. For example, when including GDP per capita, the coefficients on corporate governance variables become insignificant. It is therefore not clear whether other country characteristics correlated with economic development, such as transparency as defined here, is driving the results. In addition, their work did not examine the implication of government opacity in terms of macroeconomic policies and data release.

We relate the size of monthly fund flows during the Asian and Russian crises to our measures of country transparency. Specifically, we look at percentage change in asset allocation, or flows relative to preceding month's holdings of individual funds across countries during the period of the Asian and Russian crises, namely May 1997-September 1998. [We have also examined the Asian and Russian crises separately, and found that the main conclusions are not sensitive to the choice of horizons.] The regression equation therefore had the form:

$$\frac{f_{ijt}}{A_{ijt-1}} = \alpha \cdot OpacityIndex + \beta \cdot ControlVar + \eta_j + v_i + \varepsilon_{i,j,t} \tag{8}$$

Where f_{ijt} is the flow of fund j into country i at time t, A_{ijt-1} are the assets of fund j in country i at time t-1, η_j is a fund fixed effect and v_i a country random effect. A negative value of α indicates that capital flows to less transparent countries are smaller.

The basic results are reported in Table 11. The coefficients on all measures of opacity consistently have a negative sign. This suggests that more opaque countries indeed experience larger outflows during the crises (though the coefficient is not significant for the composite O-Factor measure). In Table 12, we observe that the link is visible between capital outflow and opacity measures in macro policies, macro data and corporate accounting standards, though not for the other measures. is still visible when controlling for other variables.

In a horserace between the three opacity indices, MACROPOLICY, MACRODATA, and CORPORATE OPACITY, reported in Table 13, MACRODATA OPACITY enters significantly at the five percent level while CORPORATE OPACITY is significant at the ten percent level.

Note that the estimation technique used here is relatively conservative, since in addition to individual fund fixed effects, we include country random effects, which can be expected to absorb a significant fraction of the variation in country characteristics. Instead of the ICRG risk

measures, we also used crisis probabilities as predicted by the early warning model of Berg and Pattillo (1999) and Kaminsky, Lizondo, and Reinhart (1998) as controls, without changing the main results (not shown to conserve space).

As a robustness check, we also employ a measure of accounting standard quality proposed by La Porta, López-de-Silanes, Shleifer, and Vishny (1998) (LLSV). The measure was published in 1991 and hence is pre-determined relative to the investment positions of the funds in our sample. It turns out that the results using this variable are very similar to the ones obtained with CORPORATE OPACITY.

4. CONCLUSION

This paper represents a first assessment of the impact of country transparency on the behavior of international investment funds. There are some noteworthy findings. First, we find relatively clear evidence that international funds prefer to hold more assets in more transparent markets. Second, there is some evidence that herding among funds is more prevalent in less transparent countries. Third, the data suggest that funds do react less strongly to macroeconomic news about less transparent countries. Fourth, there is some modest evidence that during a crisis, international investors tend to flee more opaque markets.

We conjecture that the effects of opacity documented here are likely to represent a lower bound for the overall effects on the universe of international investors that go beyond specialized emerging market funds. In future research, it would be useful to contrast these findings with the behavior of other players in international capital markets, and with that of domestic investors in these countries.

REFERENCES

Acemoglu, D., Johnson, S., Robinson, J, 2001. "The Colonial Origins of Comparative Development: An Empirical Investigation," American Economic Review, Vol. 91, No.5 (December), 1369-1401.

Ahearne, A., Griever, W., Warnock, F., 2000. "Information Costs and Home Bias: An Analysis of U.S. Holdings of Foreign Equities," International Finance Discussion Paper 691, Board of Governors of the Federal Reserve System

Allum, P., Agça, M., 2001. "Economic Data Dissemination: What Influences Country Performance On Frequency and Timeliness?," IMF Working Paper 01/173 (Washington: International Monetary Fund).

Ausubel, L, 1990. "Insider Trading in a Rational Expectations Economy," American Economic Review 80, No 5, 1022-1041.

Banerjee, A., 1992. "A Simple Model of Herd Behavior," Quarterly Journal of Economics 107, 797-817.

Berg, A., Pattillo, C. 1999. "Are Currency Crises Predictable? A Test," IMF Staff Papers 46, 107–138.

Bikhchandani, S., Hirshleifer, D., Welch, I., 1992. "A Theory of Fads, Fashion, Custom, and Cultural Change as Information Cascades," Journal of Political Economy 100, 992-1020.

Bikhchandani, S., Sharma, S., 2001. "Herd Behavior in Financial Markets," IMF Staff Papers 47, 279–310.

Borensztein, E. Gelos, G., 2003. "A Panic-Prone Pack? The Behavior of Emerging Market Mutual Funds," IMF Staff Papers 50, No.1

Brennan, M. J., Cao, H.H. 1997. "International Portfolio Investment Flows," Journal of Finance, Vol. 52 (5), 1851-1880.

Bushee, B., Noe, C., 2001. "Corporate Disclosure Practices, Institutional Investors, and Stock Return Volatility," Journal of Accounting Research 38 Supplement 2000.

Calvo, G., Reinhart, C., 2002. "Fear of Floating," Quarterly Journal of Economics 117, 379–408.

Choe, H., Kho, B., Stulz, R., 1999. "Do Foreign Investors Destabilize Stock Markets?" Journal of Financial Economics 54, 227–64.

Chui, A, Titman, S., Wei, K., 2000. "Momentum, Legal Systems and Ownership Structure: An Analysis of Asian Stock Markets" (unpublished manuscript).

Core, J., 2001. "A Review of the Empirical Disclosure Literature: Discussion," Journal of Accounting and Economics 31, 441–456.

Dahlquist, M., Pinkowitz, L., Stulz, R., Williamson, R., 2002. "Corporate Governance and the Home Bias," working paper

Demirgürç-Kunt, A., Detragiache, E., 1998. "The Determinants of Banking Crises in Developing and Developed Countries," IMF Staff Papers 45, 81–109.

Diamond, Douglas W., Verrecchia, R. 1991. "Disclosure, Liquidity, and the Cost of Capital, " Journal of Finance 46, 1325–59.

Disyatat, P. Gelos, G., 2001. "The Asset Allocation of Emerging Market Mutual Funds," IMF Working Paper 01/111 (Washington: International Monetary Fund)

Doidge, C., Karolyi A., Stulz, R., 2002. "Why are Foreign Firms Listed in the U.S. Worth More?," mimeo

Erb, C., Harvey, C., Viskanta, T., 1996. "Expected Returns and Volatility in 135 Countries," Journal of Portfolio Management 22, 46–58.

Fisman, R. 2000. "Estimating the Value of Political Connections," American Economic Review, Vol. 91, 1095–1102.

French,K., Poterba, J., 1991. "Investor Diversification and International Equity Markets," American Economic Review, Papers and Proceedings, 222-226.

Furman, J., Stiglitz, J., 1998. "Economic Crises: Evidence and Insights from East Asia," Brookings Papers on Economic Activity, No. 2, 1–135.

Geraats, P., 2000. "Central Bank Transparency," Economic Journal 112, 532-565.

Grinblatt, M., Titman, S., Wermers, R. 1995. "Momentum Investment Strategies, Portfolio Performance, and Herding: A Study of Mutual Fund Behavior," American Economic Review 85, 1088–1105.

G-22, 1998. Report of the Working Group on Transparency and Accountability

Healy, P., Palepu, K., 2001. "A Review of the Empirical Disclosure Literature," Journal of Accounting and Economics 31, 441–45.

Institute of International Finance, 1999. Report of the Working Group on Transparency in Emerging Markets Finance," Washington, D.C.

International Country Risk Guide, various years

International Monetary Fund, 2001. IMF Survey Supplement 30, September, Washington, D.C., 7–8.

Johnson, S., Boone, P., Breach, A., Friedman, E., 2000. "Corporate Governance in the Asian Financial Crisis," Journal of Financial Economics 58, 141–186.

Kaminsky, G., Lizondo, S., Reinhart, C., 1998. "Leading Indicators of Currency Crises," IMF Staff Papers 45, 1–48.

Kaminsky, G., Lyons, R., Schmukler, S. 2000. "Managers, Investors, and Crises: Mutual Fund Strategies in Emerging Markets," World Bank Working Paper 2399 (Washington: World Bank)

Kaminsky, G. , Schmukler, S., 2003. "Short-Run Pain, Long-Run Gain: The Effects of Financial Liberalization," IMF Working Paper 03/34.

Kim, W., Wei, S., 2002a. "Foreign Portfolio Investors Before and During a Crisis" Journal of International Economics 56, 77–96.

Kim, W., Wei, S., 2002b. "Offshore Investment Funds: Monsters in Emerging Markets?," Journal of Development Economics 68, 205-224.

Lakonishok, J., Shleifer, A., Vishny, R., 1992. "The Impact of Institutional Trading on Stock Prices," Journal of Financial Economics 32, 23–44.

La Porta, R., López-de-Silanes, F., Shleifer, A., Vishny, R., 1997, "Legal Determinants of External Finance," Journal of Finance 52, 1131-1150.

La Porta, R., López-de-Silanes, F., Shleifer, A., Vishny, R., 1998. "Law and Finance," Journal of Political Economy, 106, 1113–55.

Maug, E. and Naik, N., 1996. "Herding and Delegated Portfolio Management," mimeo, London Business School

Mehrez, G., Kaufmann, D., 2000. "Transparency, Liberalization, and Banking Crises," World Bank Working Paper 2286 (Washington: World Bank)

Moulton, B., 1990. "An Illustration of A Pitfall in Estimating the Effects of Aggregate Variables of Micro Units," Review of Economics and Statistics, 334–338.

Morck, R., Yeung, B., Yu, W., 2000. "The Information Content of Stock Markets: Why Do Emerging Markets Have Synchronours Stock Price Movements?," Journal of Financial Economics, 58, 215–260.

Pistor, K., Raiser, M., Gelfer, S. 2000. "Law and Finance in Transition Economies," Economics of Transition 8, 325–68.

Portes, R., Rey, H., 1999. "The Determinants of Cross-Border Equity Flows," NBER Working Paper 7336

PricewaterhouseCoopers, 2001. The Opacity Index, www.opacityindex.com.

Reinhart, C., Rogoff, K., 2002. "The Modern History of Exchange Rate Arrangements: A Reinterpretation," NBER Working Paper No. 8963

Rogers, W., 1993. "Regression Standard Errors in Clustered Samples," Stata Technical Bulletin 13, 19-23.

Scharfstein, D.S. and J.C. Stein, 1990. "Herd Behavior and Investment," American Economic Review 80, 465-79.

Shu, S., 2000. "Firms' Discretionary Choices in the Face of an Earnings Disappointment," unpublished manuscript, Boston College.

Stulz, R., 1981. "On the Effects of Barriers to International Investment," Journal of Finance, Vol. 36, pp. 923-34.

Tesar, L. Werner, I., 1995, "Home Bias and High Turnover." Journal of International Money and Finance, Vol. 14, 467-93.

Vishwanath, T., Kaufmann, D. 2001. "Toward Transparency: New Approaches and Their Application to Financial Markets," The World Bank Research Observer, Vol. 16, 41–57.

Wei, S., 2000. "Local Corruption and Global Capital Flows," Brookings Papers on Economic Activity, No. 2, 303–54.

Wei, S., 2001. "Domestic Crony Capitalism and International Fickle Capital: Is There a Connection?," International Finance, Vol. 4 (Spring), 15–45.

Welch, I., 1992. "Sequential Sales, Learning, and Cascades," Journal of Finance 47, No.2, 695-732.

Wilshire Associates, 2002. "Permissible Equity Markets Investment Analysis and Recommendations," prepared for The California Public Employees' Retirement System

World Economic Forum, various years, The Global Competitiveness Report, Geneva.

Zwiebel, J., 1995. "Corporate Conservatism and Relative Compensation," Journal of
      Political Economy 103, 1-25.

Appendix: Opacity Measures and Other Variables

Corporate Opacity

The Global Competitiveness Report includes results from surveys about the level of financial disclosure. The respondents have to assess the validity of the statement "The level of financial disclosure required is extensive and detailed" with a score from 1 (=strongly disagree) to 7 (strongly agree). We use the numbers appearing in the 2000 and 1999 issues (the questions were not covered in other issues), which are based surveys carried out one year earlier. We form a variable FINDIS by subtracting the original variable from eight. Similarly, the Global Competitiveness Report surveys the degree of "availability of information" about business. Again, we use the numbers appearing in the 2000 and 1999 issues, and form a variable AVAIL by subtracting the original variable ranges from eight. We construct a new summary variable, which is equal to the simple average of AVAIL and FINDIS, called **CORPORATE OPACITY**.

Measures of Government Opacity

Opacity of Macroeconomic Policies

Here, we rely on two measures developed by Oxford Analytica for Wilshire Associates. Wilshire Associates (2002) had in turn commissioned this work as part of an investment analysis on "permissible equity markets" produced for the California Public Employees' Retirement System. Oxford Analytica delivered detailed reports for 27 countries, on which basis it assigned a score from 1 (least transparent) to 5 (most transparent) to fiscal and monetary policy. The reports were to a significant extent based on the IMF's recent Reports on Standards and Codes (ROSCs) – the IMF, however, did not assign scores to individual countries. We use the sum of Oxford Analytica's scores, which ranges from three to eight, and subtract it from ten and label the variable **MACROPOLICY OPACITY**.

Frequency and Timeliness of Macroeconomic Data Dissemination

The IMF has computed indices of the frequency and timeliness of national authorities' macroeconomic data dissemination for all its member countries. The indices are available for 1996, 1997 and 2000 (see Allum and Agça, 2001). We use the average of these three values and subtract them from ten. Then, we construct a simple average of the two variables and call it **MACRODATA OPACITY**. For 1998 and 1999 we use the 1997 values.

A Composite Index

The accountancy and consulting company PricewaterhouseCoopers has recently conducted a survey of banks, firms, equity analysts, and in-country staff during the third and fourth quarters of the year 2000 to generate measures of opacity in five areas (PricewaterhosueCoopers, 2001): bureaucratic practices (corruption), legal system, government macroeconomic policies, accounting standards and practices, and regulatory regime. This variable is called **OFACTOR**.

Data from International Country Risk Guide (ICRG)

The International Country Risk Guide (ICRG) provides monthly values for 22 components grouped into three major categories of risk: political, financial, and economic, with political risk comprising 12 components, financial risk 5 components, and economic risk 5 components. Each component is assigned a maximum numerical value (risk points), with the highest number of points indicating the lowest potential risk for that component and the lowest number (0) indicating the highest potential risk. The maximum points able to be awarded to any particular risk component is pre-set within the system and depends on the importance (weighting) of that component to the overall risk of a country.

The ICRG staff collects political, economic and financial information, and converts these into risk points for each individual risk component. The political risk assessments are made on the basis of subjective analysis of the available information, while the financial and economic risk assessments are made solely on the basis of objective data.

The components, which are added to construct a risk rating for each subcategory, are listed below. For further details, see http://www.prsgroup.com/commonhtml/methods.html#_International_Country_Risk.

Political Risk Components	Financial Risk Components	Economic Risk Components
Government Stability Socioeconomic Conditions Investment Profile Internal Conflict External Conflict Corruption Military in Politics Religious Tensions Law and Order Ethnic Tensions Democratic Accountability Bureaucracy Quality	Foreign Debt as a Percentage of GDP Foreign Debt Service as a Percentage of XGS Current Account as a Percentage of XGS Net Liquidity as Months of Import Cover Exchange Rate Stability	GDP per Head of Population Real Annual GDP Growth Annual Inflation Rate Budget Balance as a Percentage of GDP Current Account Balance as a Percentage of GDP

Table A1. Opacity Measures (Averages)

COUNTRY	O-FACTOR (composite)	MACRO DATA OPACITY	MACRO POLICY OPACITY	CORPOPRATE OPACITY	LLSV Accounting OPACITY
Argentina	40	0.20	2	3.13	55
Bangladesh	.	1.79	.	.	.
Botswana	.	3.32	.	.	.
Brazil	34	0.11	2	3.03	46
Chile	23	0.62	2	2.20	48
China		1.87	7	4.23	.
Colombia	39	1.27	3	3.57	50
Czech Rep.	41	0.27	2	3.76	.
Ecuador	42	0.55	.	5.06	.
Egypt	39	1.81	6	3.66	76
Ghana	.	2.20	.	.	.
Greece	37	1.55	.	3.13	45
Hong Kong SAR	29	1.94	.	2.18	31
Hungary	31	0.35	2	3.23	.
India	38	1.45	4	3.22	43
Indonesia	47	0.71	4	3.83	65
Israel	35	0.63	3	2.29	36
Jordan	.	1.24	5	3.17	.
Kenya	43	1.13	.	.	.
Korea	42	1.00	3	3.25	38
Malaysia	.	0.86	4	2.86	24
Mauritius	.	2.91	.	3.14	.
Mexico	33	0.32	3	3.36	40
Morocco	34	1.59	4	.	.
Pakistan	38	1.10	7	.	61
Peru	38	0.46	3	3.39	62
Philippines	37	0.38	3	3.40	35
Poland	44	0.51	3	3.33	.
Portugal	.	0.56	.	2.88	64
Romania	.	0.41	.	.	.
Russia	55	0.34	5	4.21	
South Africa	34	0.73	3	2.55	30
Singapore	22	0.84	.	2.06	22
Slovak Rep.	38	0.27	.	3.78	.
Sri Lanka	.	1.12	6	.	.
Taiwan	37	.	4	2.59	35
Thailand	42	0.51	5	3.75	36
Turkey	46	0.50	5	2.89	49
Venezuela	42	0.90	6	4.28	60
Zimbabwe	46	1.40	.	3.17	.

Sources: Authors' calculations based on data from Global Competitiveness Report, IMF, Oxford Analytica, and PriceWaterhouseCoopers (see preceding text).

Table 1. Correlation Between Opacity Measures

		OFACTOR	MACROPOLICY OPACITY	MACRODATA OPACITY	CORPORATE OPACITY
Overall	OFACTOR	1			
Government Opacity	MACROPOLICY OPACITY	0.44	1		
	MACRODATA OPACITY	0.06	0.63	1	
Corporate Opacity	CORPORATE OPACITY	0.69	0.54	0.02	1
Correlation with income levels	*GDP per capita*	*-0.54*	*-0.40*	*-0.03*	*-0.56*

Table 2. The Effect of Opacity on Investment by Global Funds

	O-Factor (Composite)	MACROPOLICY OPACITY	MACRODATA OPACITY	CORPORATE OPACITY
MSCI Index	**0.839** **(36.90)**	**0.933** **(47.13)**	**0.829** **(37.11)**	**0.806** **(35.46)**
Opacity index	**-0.086** **(-7.13)**	**-0.449** **(-9.28)**	**-0.371** **(-2.38)**	**-0.976** **(-9.74)**
Number of obs.	29,621	24,944	31,180	31,180
Fund fixed effects	Yes	yes	yes	yes
Clustering by country-month	Yes	yes	yes	yes
Adj. R^2	0.66	0.66	0.63	0.62

Note: OLS regressions with fund fixed effects. Dependent variable: Country portfolio weight of fund *i* in country *j* at time *t* (w_{ijt}). T-statistics are given in parentheses (based on robust standard errors, allowing for clustering by fund). Total number of countries: 19–21. Coefficients that are significant at the 5 percent level are marked bold.

Table 3. Opacity and Investment by Global Funds: Adding Control Variables

	OFACTOR	MACROPOLICY OPACITY	MACRODATA OPACITY	CORPORATE OPACITY
MSCI Index	**0.861** **(43.79)**	**0.794** **(24.27)**	**0.840** **(31.08)**	**0.818** **(30.79)**
Opacity Index	**-0.156** **(-8.62)**	**-0.733** **(-8.35)**	**-0.508** **(-4.74)**	**-1.428** **(-5.42)**
Opacity Index·Crisis dummy	**0.009** **(6.60)**	**0.087** **(4.17)**	**0.215** **(2.86)**	**0.082** **(4.43)**
GDP per capita	**0.099** **(7.18)**	**0.074** **(2.47)**	**0.205** **(12.85)**	**0.079** **(2.98)**
Mean Turnover	**-5.177** **(-6.09)**	1.168 (1.12)	**-1.756** **(-2.54)**	**-7.145** **(4.65)**
Share of firms closely held	**-0.027** **(-5.51)**	**0.006** **(0.66)**	**-0.065** **(9.78)**	**-0.039** **(-5.99)**
Minority Shareholders' Rights	**-0.208** **(-4.12)**	**-0.379** **(-6.95)**	-0.092 (-1.88)	**-0.359** **(-4.80)**
ICRG Economic Risk	**-0.042** **(-2.73)**	**-0.033** **(-2.15)**	**-0.042** **(-2.89)**	**-0.061** **(-3.57)**
ICRG Financial Risk	-0.013 (-0.88)	0.014 (1.00)	**-0.051** **(-3.02)**	0.007 (0.48)
ICRG Political Risk	**-0.119** **(-14.79)**	**-0.068** **(-7.63)**	**-0.106** **(-12.83)**	**-0.084** **(-8.79)**
Historical returns	**20.857** **(6.49)**	**22.873** **(5.18)**	**16.419** **(4.48)**	**8.925** **(2.48)**
Number of obs.	25,255	21,672	25,379	25,844
Fund fixed effects	Yes	Yes	Yes	Yes
Adj. R^2	0.66	0.66	0.63	0.60

Note: OLS regressions with fund fixed effects. Dependent variable: Country portfolio weight of fund i in country j at time t (w_{ijt}). T-statistics in parentheses (based on robust standard errors, allowing for error clustering by fund). Total number of countries: 16. Coefficients that are significant at the 5 percent level are marked bold.

Table 4. Opacity and Investment by Global Funds: Adding Exchange Rate Regimes

	OFACTOR	MACROPOLICY OPACITY	MACRODATA OPACITY	CORPORATE OPACITY
MSCI Index	**1.041** **(47.56)**	**0.861** **(23.62)**	**0.888** **(33.23)**	**0.861** **(35.28)**
Opacity index	**-0.034** **(-1.44)**	**-0.602** **(-4.87)**	**-0.494** **(-4.59)**	**-2.197** **(-8.93)**
Opacity Index·Crisis dummy	**0.011** **(6.03)**	**0.151** **(6.92)**	**0.295** **(3.85)**	**0.111** **(6.11)**
GDP per capita	**0.194** **(12.55)**	**0.184** **(3.86)**	**0.198** **(12.29)**	**0.029** **(1.10)**
Mean Turnover	**-7.829** **(-10.39)**	0.973 (1.27)	**-5.615** **(-7.67)**	**-9.046** **(-5.86)**
Minority Shareholders' Rights	0.041 (0.68)	**-0.174** **(-2.20)**	**0.119** **(2.39)**	**-0.306** **(-4.07)**
Share of firms closely held	**-0.018** **(-4.25)**	**0.006** **(0.67)**	**-0.049** **(-7.85)**	**-0.019** **(-3.15)**
Exchange rate Dummy: peg	-0.181 (-0.29)	**0.433** **(0.68)**	0.557 (0.82)	0.592 (0.89)
Exchange rate Dummy: Limited Flexibility	-0.403 (-0.73)	0.905 (1.52)	0.258 (0.41)	0.355 (0.58)
Exchange rate Dummy: Managed Floating	-0.021 (-0.03)	**1.805** **(2.41)**	0.837 (1.15)	0.603 (0.85)
Exchange rate Dummy: Freely Floating	**-3.22** **(-4.77)**	-1.011 (-1.39)	**-1.809** **(-2.75)**	**-2.675** **(-4.05)**
Exchange rate Dummy: Freely Falling	-0.123 (-0.20)	0.647 (0.93)	0.094 (0.14)	-0.597 (-0.96)
ICRG Economic Risk	-0.014 (-0.95)	**-0.040** **(-2.76)**	**-0.072** **(-4.85)**	**-0.105** **(-6.05)**
ICRG Financial Risk	0.019 (1.55)	0.028 (1.53)	-0.022 (-1.36)	**0.033** **(2.43)**
ICRG Political Risk	**-0.166** **(-16.89)**	**-0.091** **(-8.73)**	**-0.132** **(-15.05)**	**-0.103** **(-11.60)**
Historical returns	0.453 (0.12)	**16.189** **(3.12)**	**15.36** **(3.18)**	-3.437 (-0.85)
Fund fixed effects	yes	Yes	yes	Yes
Number of obs.	23,696	20,113	25,379	25,844
Adj. R^2	0.69	0.69	0.64	0.62

Note: OLS regressions with fund fixed effects. Dependent variable: Country portfolio weight of fund i in country j at time t (w_{ijt}). T-statistics in parentheses (based on robust standard errors, allowing for error clustering by fund). Total number of countries: 16. Coefficients that are significant at the 5 percent level are marked bold.

Table 5. Tests of Differences in Means of Holdings

Opacity variable	Mean of difference between actual and MSCI weight for Opacity Measure below median (MDLOW)	Mean of difference between actual and MSCI weight for Opacity Measure above median (MDHI)	Test that H0: MDLOW=MIDIHI Against Ha: MDLOW>MIDIHI (p-value)
OFACTOR	**0.33**	**-0.16**	**0.000**
MACROPOLICY OPACITY	**0.37**	**-0.07**	**0.000**
MACRODATA OPACITY	**0.48**	**-0.25**	**0.000**
CORPORATE OPACITY	**0.64**	**-0.39**	**0.000**

Table 6. Investment Levels: Horserace Between Transparency Measures
(additional control variables not reported)

	Regression incl. only benchmark weights as control variable (as in Table 2)	Regression incl. control variables (as in Table 3)
MACROPOLICY OPACITY	**-0.211** **(-2.37)**	**-1.121** **(-5.67)**
MACRODATA OPACITY	**-0.345** **(-2.18)**	**1.964** **(7.25)**
CORPORATE OPACITY	**-0.986** **(-5.31)**	**-1.243** **(-6.43)**
Number of obs.	21,826	16,995
Adj. R^2	0.66	0.77

Note: OLS regressions with fund fixed effects. Dependent variable: Country portfolio weight of fund i in country j at time t (w_{ijt}). T-statistics in parentheses (based on robust standard errors, allowing for error clustering by country-month). Total number of countries: 16. Coefficients that are significant at the 5 percent level are marked bold.

Table 7. Tests of Differences in Herding Means

Opacity variable	Mean Herding (in %) for Opacity Measure Below Median (MHLOW)	Mean Herding (in %) for Opacity Measure Above Median (MHHI)	Test H0: MHLOW=MHHI Against Ha: MHLOW<MHHI (p-value)
OFACTOR	**6.6**	**9.0**	**0.03**
MACROPOLICY OPACITY	**6.7**	**8.7**	**0.04**
MACRODATA OPACITY	7.4	8.6	0.29
CORPORATE OPACITY	7.1	8.6	0.11

Note: The herding measure for country i at time t is defined as $HM_{it} = |p_{it}-E[p_{it}]| - E|p_{it}-E[p_{it}]|$, where p_{it} is the proportion of all funds active in country i in month t that are buyers, and $E[p_{it}]$ is its expected value. $E[p_{it}]$ is approximated by the total number of net buyers across all countries divided by the total number of active funds in that month. To calculate $E[p_{it}]$, it is assumed that the number of buyers follows a binomial distribution. The average for each country of this measure is HM_i. The herding means MHLOW and MHHI are means of HM_i, formed within the groups of observations below and above the median of the opacity variable, respectively. Cases in which the test of equality is rejected at the 5 percent value are marked bold.

Table 8. Herding Regressions

	OFACTOR	MACROPOLICY OPACITY	MACRODATA OPACITY	CORPORATE OPACITY
Opacity Index	**0.002** **(2.48)**	0.003 (1.04)	0.016 (1.51)	**0.019** **(2.22)**
Mean turnover	-0.061 (-0.95)	-0.026 (-0.34)	-0.074 (-0.72)	0.023 (0.44)
Mean market capitalization	0.06 (1.89)	**0.149** **(2.90)**	-0.007 (-0.17)	**0.090** **(2.49)**
Number of obs.	30	26	37	31
R^2	0.16	0.33	0.13	0.31

Note: OLS regressions; dependent variable: country average of herding measure HM_i. The herding measure for country i at time t is defined as $HM_{it} = |p_{it}-E[p_{it}]| - E|p_{it}-E[p_{it}]|$, where p_{it} is the proportion of all funds active in country i in month t that are buyers, and $E[p_{it}]$ is its expected value. $E[p_{it}]$ is approximated by the total number of net buyers across all countries divided by the total number of active funds in that month. To calculate $E[p_{it}]$, it is assumed that the number of buyers follows a binomial distribution. T-statistics (based on heteroskedasticity-robust estimates) are given in parentheses. Regressions also include a constant (not shown). Coefficients that are significant at the 5 percent level are marked bold.

Table 9. Reaction to News

	OFACTOR	MACROPOLICY OPACITY	MACRODATA OPACITY
GDP forecast Revision	**0.460** **(1.98)**	**0.375** **(4.70)**	**0.321** **(4.42)**
GDP forecast revision ·OpacityIndex	**-0.007** **(-2.17)**	**-0.039** **(-2.87)**	**-0.47** **(-7.84)**
GDP forecast revision ·Mean turnover	**3.73** **(11.85)**	**1.414** **(4.78)**	**3.46** **(11.42)**
GDP forecast Revision ·Mkt cap.	**0.58** **(2.62)**	**3.886** **(12.04)**	**1.64** **(6.88)**
GDP forecast revision ·GDP per capita	**-0.03** **(-8.41)**	**-0.019** **(-3.12)**	**-0.02** **(-7.88)**
GDP forecast revision ·ICRG Pol. Risk	**-0.003** **(-2.31)**	**-0.019** **(-12.00)**	**-0.01** **(-7.56)**
GDP forecast revision ·ICRG Econ. Risk	**-0.016** **(-4.59)**	**-0.14** **(-4.31)**	**-0.01** **(2.34)**
GDP forecast revision ·ICRG Fin. Risk	**0.02** **(6.91)**	**0.039** **(13.32)**	**0.03** **(10.9)**
Fund fixed effects	Yes	Yes	Yes
Country fixed effects	Yes	Yes	Yes
No. of obs.	53,763	45,897	56,469
R^2	0.01	0.02	0.01

Note: OLS regressions, including fund- and country fixed effects.The dependent variable is the change in country i's weight in fund j's portfolio at time t, minus the weight at time t-2: $w_{i,j,t} - w_{i,j,t-2}$. T-statistics are given in parentheses (based on robust standard errors, allowing for error clustering within funds). Coefficients that are significant at the 5 percent level are marked bold.

Table 10. Reaction to News: Horserace Among Opacity Variables

GDP forecast Revision	**0.473** **(6.04)**
GDP forecast revision ·MACROPOLICY OPACITY	**-0.037** **(-2.56)**
GDP forecast revision ·MACRODATA OPACITY	**-0.191** **(-2.89)**
GDP forecast revision ·Mean turnover	**1.929** **(5.18)**
GDP forecast Revision ·Mkt cap.	**3.505** **(10.10)**
GDP forecast revision ·GDP per capita	**-0.028** **(-4.72)**
GDP forecast revision ·ICRG Pol. Risk	**-0.018** **(-9.46)**
GDP forecast revision ·ICRG Econ. Risk	**-0.012** **(-3.87)**
GDP forecast revision ·ICRG Fin. Risk	**0.037** **(12.60)**
Fund fixed effects	Yes
Country fixed effects	Yes
No. of obs.	48,250
R^2	0.03

Note: OLS regressions, including fund- and country fixed effects.The dependent variable is the change in country i's weight in fund j's portfolio at time t, minus the weight at time t-2: $w_{i,j,t} - w_{i,j,t-2}$. T-statistics are given in parentheses (based on robust standard errors, allowing for error clustering within funds). Coefficients that are significant at the 5 percent level are marked bold.

Table 11. Asian and Russian Crises: Fund flows and Opacity

	OFACTOR	MACROPOLICY OPACITY	MACRODATA OPACITY	CORPORATE OPACITY	Corp. Opacity: LLSV Accounting Standards
Opacity variable	-0.004 (-1.85)	**-0.005** **(-4.40)**	**-0.01** **(-4.00)**	**-0.007** **(-3.42)**	**-0.008** **(-6.94)**
R^2	0.04	0.05	0.04	0.04	0.05
Country random effects	Yes	Yes	Yes	Yes	Yes
Fund fixed effects	Yes	Yes	Yes	Yes	Yes
No. of countries	27	26	34	30	22
No. of obs	12,353	11,866	13,717	13,815	12,141

Note: OLS regressions with country random effects and fund fixed effects. Dependent variable: Monthly flows from fund i to country j (f_{ijt}), divided by lagged assets of fund i in country j (A_{ijt-1}), covering the period 97:05–98:09. Regressions include fund-fixed effects and country random effects. Z statistics are given in parentheses. LLSV accounting standards=100-original accounting standard variable reported in La Porta, López-de-Silanes, Shleifer, and Vishny (1998).

Table 12. Asian and Russian Crises: Fund flows and Opacity, including Control Variables

	OFACTOR	MACROPOLICY OPACITY	MACRODATA OPACITY	CORPORATE OPACITY	Corp. Opacity: LLSV Accounting Standards
Opacity variable	0.001 (3.18)	**-0.004** **(-2.67)**	**-0.028** **(-6.78)**	-0.001 (-0.15)	**-0.001** **(-4.48)**
Turnover	-0.009 (-0.36)	-0.002 (-0.09)	**0.137** **(4.03)**	**0.054** **(2.15)**	**0.059** **(2.43)**
GDP per capita	0.000 (0.27)	**0.003** **(3.79)**	**0.001** **(2.81)**	0.001 (1.66)	0.00 (0.00)
ICRG Economic Risk (lagged one month)	-0.006 (-1.16)	**-0.003** **(-5.45)**	**-0.002** **(-3.30)**	**-0.002** **(-3.43)**	0.0001 (0.28)
ICRG Financial Risk (lagged one month)	**0.008** **(2.22)**	**0.002** **(5.27)**	**0.002** **(5.20)**	0.001 (1.64)	0.006 (1.51)
ICRG Political Risk (lagged one month)	**0.001** **(6.05)**	**0.001** **(2.73)**	0.000 (1.24)	**0.001** **(3.97)**	0.000 (0.07)
R^2	0.05	0.06	0.05	0.05	0.06
Country random effects	Yes	Yes	Yes	Yes	Yes
Fund fixed effects	Yes	Yes	Yes	Yes	Yes
No. of countries	27	25	32	29	22
No. of obs	10,758	10,153	11,735	12,008	10,572

Note: OLS regressions with country random effects and fund fixed effects. Dependent variable: Monthly flows from fund i to country j (f_{ijt}), divided by lagged assets of fund i in country j (A_{ijt-1}), covering the period 97:05–98:09. Regressions include fund-fixed effects and country random effects. Z statistics are given in parentheses. LLSV accounting standards=100-original accounting standard variable reported in La Porta, López-de-Silanes, Shleifer, and Vishny (1998).

Table 13. Asian and Russian Crises: Horserace Among Opacity indices

MACRODATA OPACITY	**-0.035** **(-3.54)**
MACROPOLICY OPACITY	0.004 (1.32)
CORPORATE OPACITY	**-0.012** **(-1.72)**
Turnover	0.204 (3.28)
GDP per capita	0.002 (1.94)
ICRG Economic Risk (lagged one month)	-0.002 (-3.45)
ICRG Financial Risk (lagged one month)	0.003 (5.27)
ICRG Political Risk (lagged one month)	0.000 (0.73)
R^2	0.07
Country random effects	Yes
Fund fixed effects	Yes
No. of countries	22
No. of obs	9,037

Note: OLS regressions with country random effects and fund fixed effects. Dependent variable: Monthly flows from fund i to country j (f_{ijt}), divided by lagged assets in country j (A_{ijt-1}), covering the period 97:05–98:09. Regressions include fund-fixed effects and country random effects. Z statistics are given in parentheses. LLSV accounting standards=100-original accounting standard variable reported in La Porta, López-de-Silanes, Shleifer, and Vishny (1998).

Figure 1. Mean Herding and Opacity