CHAPTER 12

The Impact of Benchmark Investing by Institutional Investors on International Capital Allocations

Claudio Raddatz, Sergio L. Schmukler, and Tomás Williams

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C. Raddatz
International Monetary Fund (IMF), Washington, DC, USA
e-mail: craddatzkiefer@imf.org

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12.1 Introduction

Over the past two decades, many countries have tried to foster the development of their capital markets through the promotion of institutional investors. The expectation was that they would invest domestically and internationally, providing opportunities for retail investors to hold a diversified, well-balanced portfolio, simultaneously helping to deepen financial markets and, more generally, increase access to finance for firms and sovereigns. Moreover, institutional investors were anticipated to have long-term investment horizons, which would allow them to take advantage of long-term risk and illiquidity premiums to generate higher returns on their assets. In addition, they were expected to behave in a patient, countercyclical manner, making the most of cyclically low valuations to seek attractive investment opportunities, helping to promote financial stability.

As a result of these policies and the more general trend toward the use of capital markets, non-bank institutional investors emerged across countries and rapidly became key participants in global financial markets. In fact, the proportion of household savings channeled through these institutional investors has grown significantly in recent decades, and their assets under management are rapidly catching up with those of the banking system. Data from the Organization for Economic Co-operation and Development (OECD) show that in 2013, financial assets under management reached USD24.7 trillion for pension funds, USD26.1 trillion for insurance companies, and USD34.9 trillion for mutual funds (Fig. 12.1).

In the context of this rapid expansion, it has become important to understand how institutional investors allocate their assets and how they can affect investments in different countries. In this chapter, we focus on international mutual fund investments across countries. Whereas mutual funds are just one part of the industry, and we cannot immediately extrapolate our findings to other players, their analysis provides an illustration of

S. L. Schmukler (✉)
World Bank, Washington, DC, USA
e-mail: sschmukler@worldbank.org

T. Williams
Universitat Pompeu Fabra, Barcelona, Spain

George Washington University, Washington, DC, USA
e-mail: tomaswilliams@email.gwu.edu

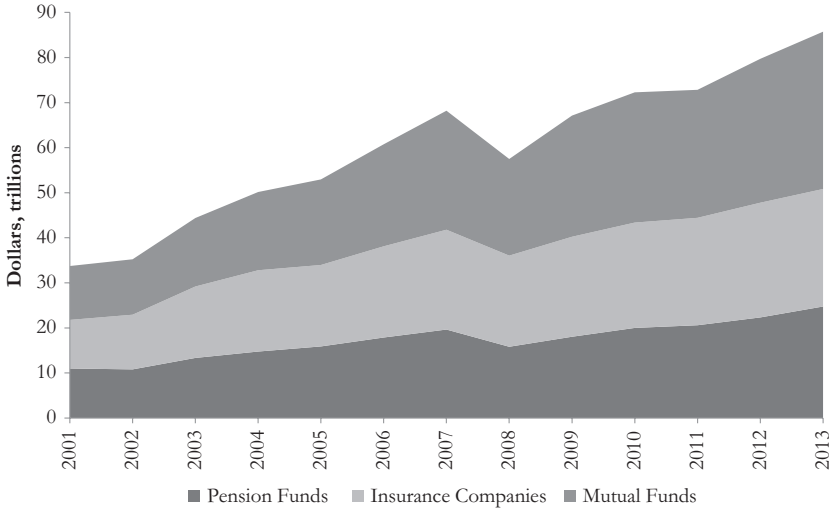

Fig. 12.1 Assets under management of non-bank institutional investors, 2001–2013

the drivers of institutional investors' behavior and the incentives they face. Also, in many countries they are the largest institutional investors. Because data for mutual funds are much more detailed than for the remaining institutional investors, it is easier to analyze the behavior of managers and their underlying investors. Furthermore, an advantage of international mutual funds in particular is that they enable us to study the effects these funds have on the international investments countries receive, as well as on the respective asset prices.

There are different types of international mutual funds, which as a group have been expanding worldwide and, by the end of 2016, had accumulated USD43.5 trillion in assets under management around the world (Investment Company Institute, ICI).[1] But one notable development in the industry (of both mutual funds and institutional investors more generally) has been the growing importance of index funds and exchange-traded funds (ETFs) that follow certain well-known benchmark indexes and are vehicles for passive investments (Fig. 12.2). These funds now account for

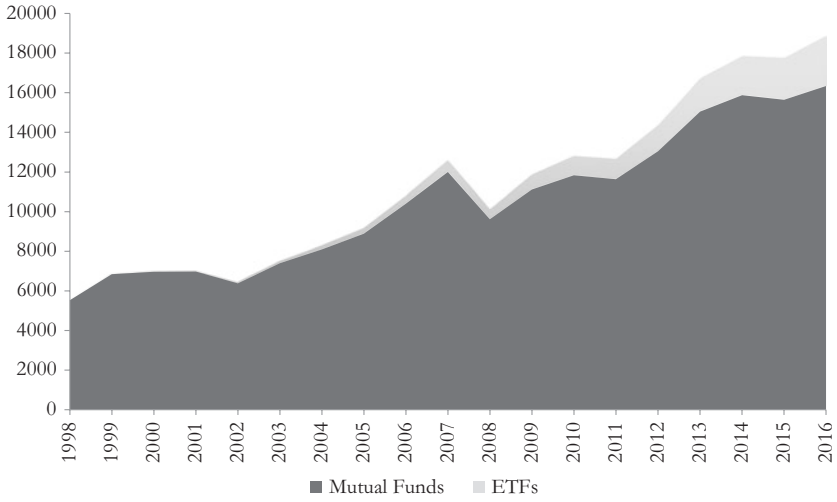

Fig. 12.2 US mutual fund assets by fund type

8.7 percent of the industry worldwide and 15.4 percent of the U.S. mutual fund industry. Moreover, this trend toward benchmark investing is likely to accentuate for three reasons. First, several studies have argued that many active funds already manage their assets as passive investors (Cremers and Petajisto 2009; Cremers et al. 2016). Second, since the global financial crisis, there have been outflows from active mutual funds that have gone to both index funds and ETFs (Fig. 12.3). Third, in a global environment of low interest rates, the low costs, higher transparency, and the simplicity of benchmark investing might further tilt investors toward this type of vehicles. Despite the growing importance of passive institutional investors, there is little evidence on how they invest across countries.

In this chapter, we illustrate how index investing can affect international capital allocations and the related capital flows across countries, extending the analysis in Raddatz et al. (2017). In particular, we focus on a factor that, so far, has been mostly absent from the literature on international investments and that we call "the benchmark effect." The benchmark effect refers to the impact that, through various channels, prominent international equity and bond market indexes (such as, the

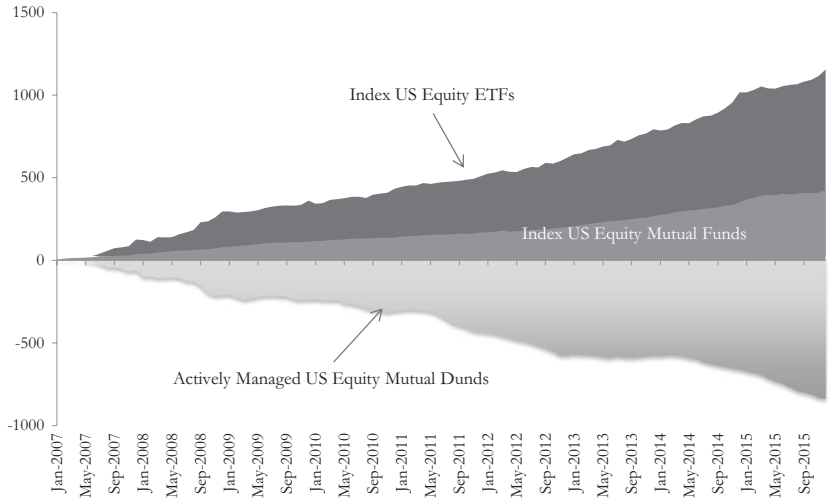

Fig. 12.3 Outflows/inflows from US equity mutual funds from ICI

MSCI Emerging Markets Index or the MSCI World Index) have on asset allocations, capital flows, and asset prices across countries.

Raddatz et al. (2017) show that large changes in benchmark indexes have effects on capital flows, asset prices, and exchange rates. In this chapter, we delve in more detail on the different channels through which benchmarks affect international capital allocations. We show how the influence of benchmarks on mutual fund asset allocations across countries impacts international capital flows. Furthermore, we describe the extent to which the use of benchmarks can generate amplification and contagion effects across countries. Building on the analysis in Raddatz et al. (2017), in this chapter, we show algebraically the presence of the different effects, describe them through various examples derived from the data, and quantify their importance.

The focus on benchmark investing is relevant to the theoretical and empirical work on country portfolios (international asset and liability positions) and capital flows. A significant part of the literature has focused on

the role that macroeconomic fundamentals play in international investment decisions, but has not analyzed the behavior of institutional investors, and in particular the effects of benchmarks, on those decisions. Some examples of the many papers on the topic are Di Giovanni (2005), Kraay et al. (2005), Lane and Milesi-Ferretti (2007), Antràs and Caballero (2009), Martin and Taddei (2013), Reinhardt et al. (2013), and Gourinchas and Rey (2014).

Other papers studying the importance of benchmarks have focused primarily on the performance evaluation of mutual funds relative to their benchmarks. In particular, they study whether active management pays (Lehmann and Modest 1987; Sharpe 1992; Wermers 2000; Cremers and Petajisto 2009; Sensoy 2009; Busse et al. 2014; Cremers et al. 2016). A related literature focuses on how benchmark redefinitions affect stock returns, pricing, and liquidity (Harris and Gurel 1986; Shleifer 1986; Chen et al. 2004; Barberis et al. 2005; Greenwood 2005; Hau et al. 2010; Hau 2011; Vayanos and Woolley 2011; Faias et al. 2012; Bartram et al. 2015; Chang et al. 2015) or how the fact that managers follow benchmarks could explain the growing correlations in financial markets between emerging economies and the United States during the 2000s (Levy Yeyati and Williams 2012). But these papers do not analyze how benchmarks affect capital allocations across countries. By simultaneously documenting how benchmarks affect capital flows and country-level asset prices, in this chapter, we help to bridge these two lines of research.

12.2 Data

To conduct our study, we use data from different sources. We work with mutual fund portfolios, benchmark indexes, and fund- and country-specific information. Raddatz et al. (2017) describe in detail the data, including the specific sources we use. Because we closely follow their procedure in matching the different databases, we limit ourselves here to providing a brief summary.

Our two main sources for country portfolio allocations of international mutual funds are Emerging Portfolio Fund Research (EPFR) and Morningstar Direct (MS). Both sources include dead and live mutual funds. The data are at monthly frequency and include open-end equity and bond funds. We complement this with information on the funds' net asset value from Datastream and MS. We also compile data on the composition

and returns of several major benchmark indexes directly from FTSE, J.P. Morgan, and MSCI through bilateral agreements, and indirectly through MS for indexes produced by Dow Jones, Euro Stoxx, and S&P.

Our main matched database consists of (1) country weights, w_{ict}, which are the country portfolio allocations of international mutual funds (those investing in several countries) as a percentage of total assets; (2) benchmark weights, w_{ict}^{B}, which are the value of the country's securities included in the relevant benchmarks as a percentage of the total securities included in the relevant benchmark; (3) mutual fund-specific information, such as its assets (A_{it}), returns (R_{it}), and relevant benchmarks; and (4) country-specific information, such as stock and bond market index returns, R_{ct}.[2] The sub-index i refers to funds, c to countries, t to time, and the supra-index B to benchmarks. This database covers the period from January 1996 to July 2012 and constitutes an unbalanced panel. Our database contains 2837 equity funds and 838 bond funds, including global, global emerging, and regional funds, and funds in our combined dataset capture an important part of the assets held by the industry of international funds.

12.3 Conceptual Framework

In this section, we explore the consequences of previous findings that the weight of a country's assets in a benchmark index affect the weight of that country on the portfolios of mutual funds following that index and the capital flows originating from these funds. We study the quantitative importance of various channels through which changes in benchmark weights impact country flows and how it is reflected in mutual fund flows and aggregate capital flows. By *capital flows* we mean the flows coming from the funds we analyze into the countries in which they invest and by *aggregate capital flows* those captured in the aggregate official statistics of countries. Because we do not have aggregate detailed data for all countries, we cannot always determine to what extent these mutual fund flows map into the balance of payments statistics at the country level. However, according to some estimates, the flows coming from only one of our data sources (EPFR) account for around 25 percent of total foreign portfolio investments (from all sources) at the country level (Puy 2013) and there is a significant correlation between the EPFR flows and those obtained from the balance of payments (Fratzscher 2012; Miao and Pant 2012). Our inclusion of data from Morningstar should ensure even better coverage.

Raddatz et al. (2017) study systematically how mutual fund weights respond to benchmark weights, using fund-level panel regressions, including different fixed effects that capture shocks to the fund at each point in time and preferences in the investments of each fund toward each country. More specifically, we estimate the parameters of the following specification:

$$w_{ict} = \theta_{ic} + \theta_{it} + \alpha_1 w_{ict}^{B} + \varepsilon_{ict}, \tag{12.1}$$

where w_{ict} is the weight for fund i, in country c, and at time t; w_{ict}^{B} is the respective benchmark weight that fund i follows; θ_{ic} and θ_{it} are fund-country and fund-time fixed effects. Raddatz et al. (2017) show that benchmarks have statistically and economically significant effects on mutual fund allocations and capital flows across countries. Mutual funds follow benchmarks rather closely. For example, a 1 percent increase in a country's benchmark weight results on average in a 0.7 percent increase in the weight of that country for the typical mutual fund that follows that benchmark. However, there is relevant heterogeneity across funds. Explicit indexing funds follow benchmarks almost one-for-one, generating some mechanical effects in allocations and capital flows.[3] Although the most active funds in our sample are less connected to the benchmarks, they are still significantly influenced by their behavior, with about 50 percent of their allocations explained by the benchmark effect.

In this chapter, we attempt to build on the previous results on asset allocation, to understand how they might affect international capital flows through different channels. To capture the relation between benchmark weights and capital flows, we start from the following identity:

$$F_{ict} = w_{ict} F_{it} + \tilde{A}_{it}\left(w_{ict} - w_{ict}^{BH}\right), \tag{12.2}$$

where F_{ict} is the net flow (in dollars) from fund i in country c at time t. w_{ict} is the portfolio weight the fund decides to have in that country at time t, $\tilde{A}_{it} = R_{it} A_{it-1}$ is the value of the fund's assets at the beginning of time t, and w_{ict}^{BH} is the fund's buy-and-hold weight in that country resulting from movements in total and relative returns.[4] F_{it} is the net flow (in dollars) to fund i at time t, which is equal to injections less redemptions.

The two terms in the equation above relate to the two forces driving a fund's flows to a country: net inflows and reallocations. Net inflows to countries occur as net flows to the fund (F_{it}) are allocated across countries in proportion to the fund's desired country weight at that moment (w_{ict}). We use the term "desired country weight" to refer to the weight the fund decides to have in that country considering all the possible constraints it faces. It does not mean to imply that it is the optimal weight that the fund would choose in an unconstrained scenario. For example, if the fund cannot change positions in a country to align them with its view of the country fundamentals because of cost considerations, we consider the desired outcome of this trade-off as the desired weight. Thus, this is a constrained optimal decision of the portfolio manager. The flows due to the reallocations of existing assets, $\tilde{A}_{it}\left(w_{ict}-w_{ict}^{BH}\right)$, arise from the difference between a fund's desired country weight and the buy-and-hold weight that mechanically results from the fund's previous allocation and movements in relative returns.

Equation 12.2 shows a direct connection between weights and country flows. Fund managers' decisions about country weights have a direct impact on country flows. For instance, an increase in the desired weight in a given country induces both a reallocation of existing assets to that country and more inflows to that country when the fund itself has injections.

To describe and quantify the various mechanisms through which the benchmark effect operates on flows, it is useful to normalize Eq. 12.2 by lagged fund assets (A_{it-1}), obtaining,

$$f_{ict}=\frac{F_{ict}}{A_{it-1}}=w_{ict}\left(\frac{A_{it}}{A_{it-1}}\right)-w_{ict-1}R_{ct}=w_{ict}\gamma_{it}-w_{ict-1}R_{ct}, \tag{12.3}$$

where $f_{it}=F_{it}/A_{it-1}$, $\gamma_{it}=f_{it}+R_{it}$, using $F_{it}+\tilde{A}_{it}=A_{it}$ and $w_{ict}^{BH}=w_{ict-1}R_{ct}/R_{it}$.

Starting from Eq. 12.3 along with the use of Eq. 12.1 linking w_{ict} and w_{ict}^{B}, we can derive the response of flows to changes in several variables, and the role that the link between funds and benchmarks has on these responses. The derivations below summarize the responses of country flows to shocks to benchmark weights, fund flows, own-country returns, and third-country returns, respectively. All of them assume that variables as of month $(t-1)$ are kept constant. The effects on flows are

$$\frac{\partial f_{ict}}{\partial w^B_{ict}} = \alpha\left(f_{it} + R_{it}\right) = \alpha\gamma_{it}, \tag{12.4}$$

$$\frac{\partial f_{ict}}{\partial f_{it}} = \alpha w^B_{ict} + \varepsilon_{ict}, \tag{12.5}$$

$$\frac{\partial f_{ict}}{\partial R_{ct}} = \alpha\gamma_{it}\frac{w^B_{ict-1}\left(1-w^B_{ict}\right)}{R^B_{it}} + w_{ict}w_{ict-1}\left(1+\frac{\partial f_{it}}{\partial R_{it}}\right) - w_{ict-1} + \gamma_{it}\frac{\partial \varepsilon_{ict}}{\partial R_{ct}}, \tag{12.6}$$

$$\frac{\partial f_{ict}}{\partial R_{\tilde{c}t}} = -\alpha\gamma_{it}\frac{w^B_{ict}\left(1-w^B_{ict-1}\right)}{R^B_{it}} + w_{ict}\left(1-w_{ict-1}\right)\left(1+\frac{\partial f_{it}}{\partial R_{it}}\right) + \gamma_{it}\frac{\partial \varepsilon_{ict}}{\partial R_{\tilde{c}t}}. \tag{12.7}$$

Using Eqs. 12.4, 12.5, 12.6, and 12.7, we discuss and illustrate the different effects of benchmarks on capital flows. While Eq. 12.4 directly shows the response of flows to changes in benchmark weights, the other benchmark effects on flows appear in the first terms of Eqs. 12.5, 12.6, and 12.7.[5]

Equation 12.4 captures the *direct benchmark effect*, or the direct impact of changes in benchmark weights. The impact on flows of an exogenous change in benchmark weights (i.e., a change not driven by returns) is proportional to the gross growth in fund assets, γ_{it} or $(f_{it} + R_{it})$. The proportionality depends on how closely fund weights track benchmark weights, as captured by the α estimated in Raddatz et al. (2017).

Equation 12.5 shows the *sensitivity effect* in its first term, which captures that an increase (decrease) in a fund's inflows will increase (decrease) the fund's capital flows to a country proportionally to the country's benchmark weight. Thus, benchmark weights determine the sensitivity of country flows to fund flows. The last term in this equation corresponds to the response of the active part of a fund portfolio to the shock. The sensitivity effect shows that countries with higher weights in a benchmark are more prone to more inflows (outflows) when the funds receive injections (suffer redemptions), possibly explaining why large countries might be subject to large changes in capital flows regardless of their fundamentals.

Equation 12.6 shows the response of country flows to own-country returns. The first term measures the *amplification effect*, according to which an increase in a country's return has a positive impact on its flows. In this case, the link to a benchmark induces inflows into (outflows from) countries experiencing positive (negative) return shocks when a fund

expands. The second term captures the extent to which the increase in returns increases the value of the fund's existing assets and, if fund flows respond to returns, also its injections. The third, negative term in this expression comes from the direct effect of country returns on buy-and-hold weights and, for a given benchmark weight, reallocations.

Equation 12.7 displays the response of country flows to third-country returns. The first term shows the *contagion effect* associated with returns. This contagion effect is different from the "margin call" and other effects described in the literature, and occurs in the absence of leverage (Calvo and Mendoza 2000; Kodres and Pritsker 2002; Manconi et al. 2012; Hau and Lai 2013). This effect is qualitatively similar to that in Eq. 12.6, but in this case, the effect is negative because an increase in every other country's returns reduces a country's relative market capitalization (and thus its benchmark weight). Therefore, it brings home shocks to returns occurring in other countries that share the benchmark. This form of contagion could be benign when negative shocks to other countries bring inflows to the unaffected one (although positive shocks to other countries bring outflows to the unaffected one). However, even under negative shocks to other countries, it is possible to have outflows in the unaffected country if the effect on the second term is large enough, namely, if flows to the fund decline strongly enough in response to a shock to its returns. Notice that, when this happens and α is small, the second term in Eq. 12.7 dominates and the contagion is no longer benign.

We perform simulations to illustrate the quantitative importance of the various manifestations of the benchmark effect. We impute values to the different parameters involved in Eqs. 12.4, 12.5, 12.6, and 12.7 using the medians and interquartile ranges of the actual data.[6] Table 12.1 yields order-of-magnitude estimates for the four effects described above, where a shock entails a move from the 25th to the 75th percentile for each variable in our sample. The different manifestations of the benchmark effect result in non-trivial variations in country flows. The simulation shows that the direct benchmark effect has the highest potential to induce inflows (or outflows). For instance, a 1.5 percentage point increase in a country's benchmark weight (from 4 percent to 5.5 percent in this case) results in an inflow corresponding to approximately 30 percent of a fund's total assets allocated to that country.[7] On the other extreme, the sensitivity effect has the lowest impact (a 3.2 percent increase in response to a 4 percentage point increase in fund flows). This is reasonable because, as its name suggests, the direct benchmark effect has a direct impact on flows. An exogenous, independent

Table 12.1 Quantitative benchmark effects on capital flows

A. Calibration				
Parameters				
A			0.8	
γ_{it}			1.0	
w_{ict}^{B}			4.0	
w_{ict-1}^{B}			4.0	
R_{ct}			1.01	
R_{it}^{B}			1.01	
B. Quantitative effects				
	Shock	Value (percentage points)	Δf_{ict}	$\Delta(f_{ict}/w_{ict-1}^{B})$ (in %)
Direct benchmark effect	Δw_{ict}^{B}	1.5	1.212	30.3
Sensitivity effect	Δf_{it}	4.0	0.128	3.2
Amplification effect	ΔR_{ct}	10.0	0.307	7.7
Contagion effect	$\Delta R_{c't}$	10.0	−0.307	−7.7

This table presents the calibration of each of the effects presented in Sect. 12.5. Parameters are calibrated according to the median values in our sample. Panel A presents the calibration for each parameter and Panel B displays the quantitative benchmark effects for shocks on different variables

Source: Authors' computations

change in a country's benchmark weight induces net inflows and reallocation effects to that country in detriment of all other countries. In contrast, an increase in fund flows is shared across all countries where a fund invests; its effect is more or less proportional to the (usually small) country weights. The sizes of the amplification and contagion effects are identical in our baseline parameterization. They both lie between the direct benchmark and sensitivity effects. The reason is that these effects work indirectly through the response of benchmark weights to each of the changes. These responses depend on the initial level of returns and benchmark weights and are usually less than one for one.

The effects described in this section affect different types of funds differently. For closed-end explicit indexing funds, the country flows are different from zero only when there is a direct benchmark effect. For open-end index funds, all the channels operate because of the flows the funds receive. For non-explicit indexing funds, the total country flows depend on the level of active management and how the manager allocates

the active part of the portfolio. However, the effects described above illustrate how their country flows respond to different shocks to the extent that they follow benchmark indexes.

In summary, this analysis shows that benchmarks can affect flows directly and indirectly by (1) affecting a fund's desired allocations (direct benchmark effect), (2) determining how a fund allocates funds across countries when facing inflows or outflows (sensitivity effect), and (3) mediating the relation between a country's flows and shocks to its returns (amplification effect) or to the returns of other countries that are part of the same benchmark (contagion effect). The next section provides some evidence on these various channels.

12.4 Evidence

In this section, we provide evidence on how benchmarks affect international capital flows through the different channels detailed in Sect. 12.2. We provide both case studies and systematic evidence to illustrate these different mechanisms.

The direct benchmark effect presented in Eq. 12.4 helps explain, for example, the counterintuitive outflows when Israel was upgraded from the MSCI Emerging Markets Index to the MSCI World Index. To show the effect of the exogenous change in benchmark weights, we compare the explicit indexing funds tracking these two indexes (Fig. 12.4).

The direct benchmark effect captures almost all the variations in country flows for both types of funds, which occur due to all the reallocations right at the time of the switch. To understand the total effect on country flows, it is important to consider that, at that time, Israel's weight in the MSCI Emerging Markets Index was 3.17 percent and in the MSCI World Index 0.37 percent, and the assets in the funds following these two indexes were not very different. Emerging market funds withdrew USD2 billion from Israel, while developed market funds injected USD160 million.[8]

One can also analyze the direct benchmark effect from the perspective of our conceptual framework. Using Eq. 12.4 in levels and assuming that all funds act as passive investors, we can multiply the total assets of funds following the MSCI Emerging Markets and the MSCI World Index by the change in benchmark weights. That corresponds to an outflow of USD8.2 billion from funds following the MSCI Emerging Markets and an inflow of USD329 million from funds following the MSCI World Index. These numbers are much larger than the observed flows because we

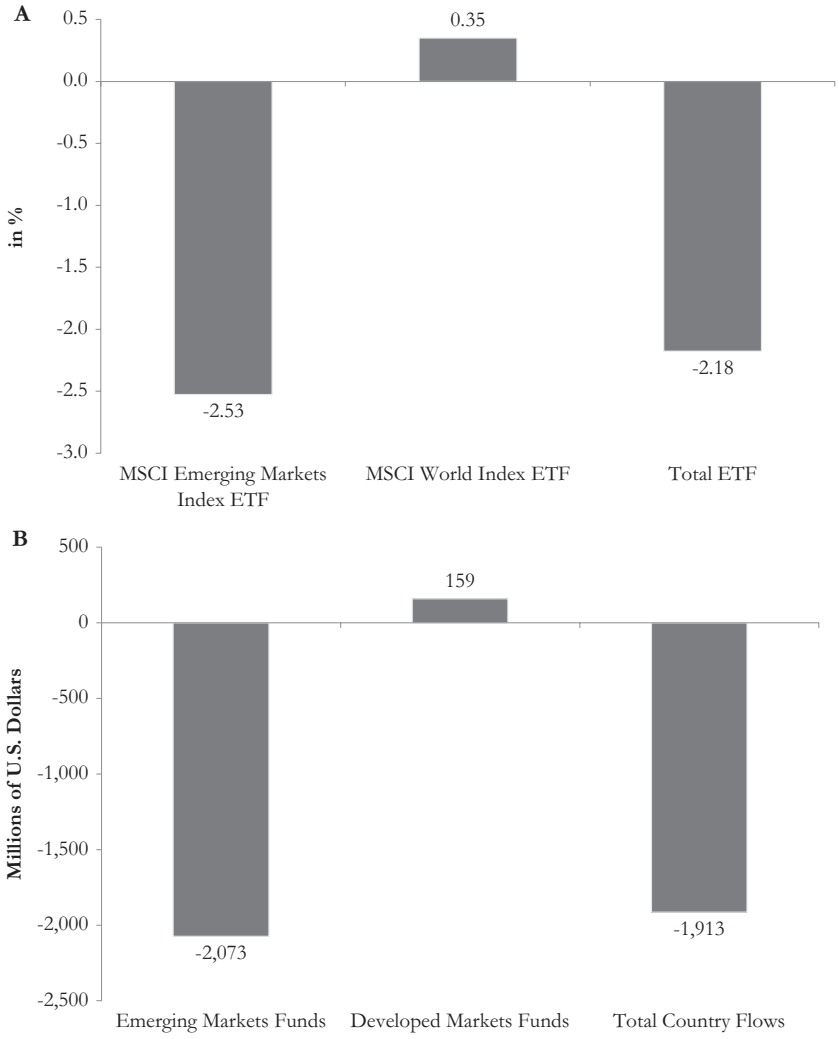

Fig. 12.4 Direct benchmark effect: The Case of Israel

assume that all funds act as passive investors. Deviations from this passive strategy would yield lower estimates. In fact, most funds are not purely passive. However, these estimates go in the direction of the observed capital flows from Israel around the month of the rebalancing.

The cases of the upgrade of Qatar and the United Arab Emirates also illustrate the impact of the direct benchmark effect on the stock market prices of these two countries as well as those of other countries in the MSCI Frontier Market Index. These two countries were upgraded from frontier to emerging market status in 2014. Because capital inflows of around USD800 million were expected for Qatar and the United Arab Emirates, there were sharp increases in prices in the MSCI stocks of these countries relative to their non-MSCI stocks (Fig. 12.5), both during the announcement date and before the effective date (when most of the buying from the emerging market funds happened). Moreover, because Qatar and the United Arab Emirates comprised around 40 percent of the MSCI Frontier Markets Index, the rest of the frontier markets were expected to have their benchmark weight increased considerably as frontier market funds reallocated away from Qatar and the United Arab Emirates. Given the size of the expected reallocations in the MSCI Frontier Markets Index, MSCI considered not removing Qatar and the United Arab Emirates from this index (even when they would still be moved to the emerging market category). In the end, it decided to move forward with the removal, but did it gradually to ameliorate the disruption in the markets (MSCI Barra 2014). The upgrade of Qatar and the United Arab Emirates not only had effects on these two countries, but also on the countries that shared the MSCI Frontier Markets Index with them. In particular, mutual fund managers tracking their performance against this index had to reallocate nearly 40 percent of their portfolio from Qatar and the United Arab Emirates to the rest of frontier markets. This portfolio reallocations generated positive capital inflows, which had positive impact on stock market prices. This episode is described in detail in Raddatz et al. (2017).

The direct benchmark effect not only affects capital flows and aggregate prices, but can also affect asset prices at the company level within a country. Argentina's downgrade by MSCI from the emerging to the frontier country category illustrates this. The event was first announced on February 20, 2009, with the effective date at the end of May 2009. Since liquidity in Argentina's stock market was not up to MSCI requirements, the company announced at the same time a change in the underlying securities. As of the effective date, the American Depositary Receipt (ADR)

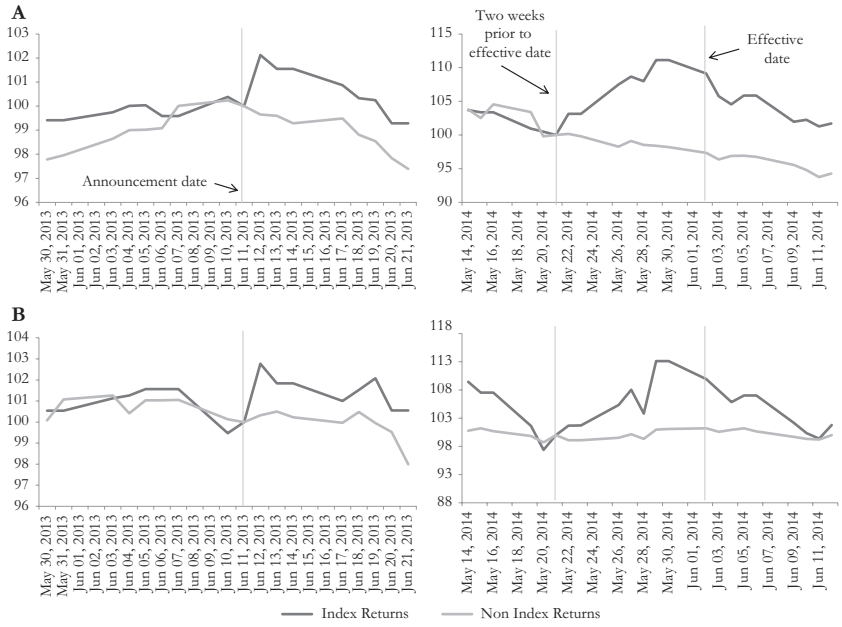

Fig. 12.5 MSCI upgrade of Qatar and the United Arab Emirates

counterparts would replace the stocks included in Argentina's index. Thus, we analyze the premium between the ADRs and the corresponding underlying stocks (Fig. 12.6). The premium fluctuated around zero before the announcement, and increased to almost 20 percent a couple of months later, even when the announcement was a downgrade. Moreover, there was a significant increase from 22 percent to 32 percent in the days previous to the effective date.

Next, we present illustrations for the sensitivity effect described in Eq. 12.5. The sensitivity effect shows that countries with higher weights in a benchmark are more prone to more inflows (outflows) when the funds receive injections (redemptions), possibly explaining why large countries

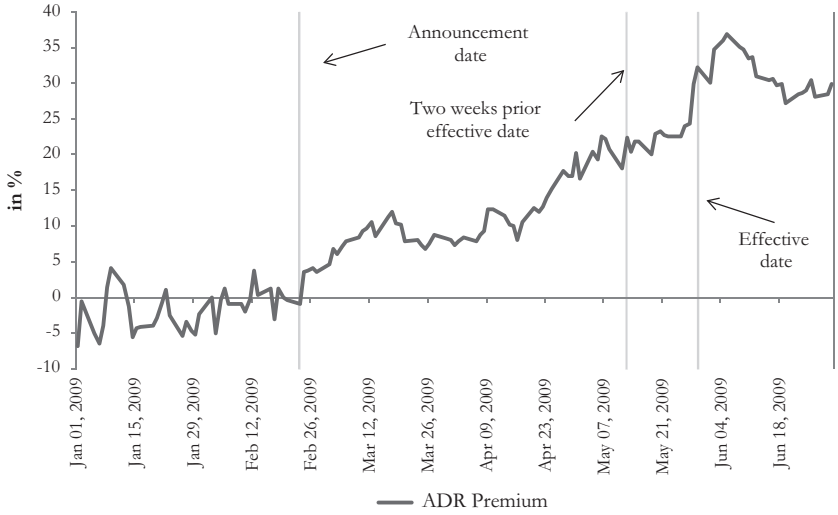

Fig. 12.6 Direct benchmark effect and asset prices: Argentina equity market

might be subject to large changes in capital flows regardless of their fundamentals. Fig. 12.7 illustrates this effect by showing the flows to Brazil and India from explicit indexing funds, tracking the MSCI Emerging Markets Index against the flows into each of these equity funds. The relation of country and fund flows is depicted by two points in time, when each country had different benchmark weights. The relation becomes steeper as each country's benchmark weight increases, as shown in Eq. 12.5.

For a more systematic analysis of the sensitivity effect, we regress country flows against benchmark weights multiplied by fund flows (Table 12.2). There is a positive and significant relation between the two variables, which monotonically decreases with the degree of active management. For example, on average across all equity funds, an injection of one dollar to a fund is associated with country flows of 0.74 dollars times the benchmark weight. Every dollar an explicit fund receives is associated with 84 cents allocated proportionally to the benchmark weight. This number declines for funds that are more active, being 0.69, 0.55, and 0.41 for closet indexing, mildly active, and truly active funds, respectively. The relation is also maintained

Table 12.2 Country flows versus benchmark flows

Explanatory variables	*Total sample*	*Degree of activism*			
		Explicit indexing	*Closet indexing*	*Mildly active*	*Truly active*
A. Equity funds					
Dependent variable: country flows					
Benchmark weight × fund flows	0.744***	0.839***	0.690***	0.547***	0.407***
	(0.028)	(0.036)	(0.014)	(0.014)	(0.017)
Fund-country fixed effects	No	No	No	No	No
Fund-time fixed effects	No	No	No	No	No
Country-time fixed effects	No	No	No	No	No
Number of observations	962,344	12,895	286,890	378,626	283,933
R-squared	0.296	0.627	0.177	0.081	0.045
Dependent variable: country flows					
Benchmark weight × fund flows	0.700***	0.794***	0.644***	0.468***	0.254***
	(0.035)	(0.043)	(0.018)	(0.018)	(0.018)
Fund-country fixed effects	Yes	Yes	Yes	Yes	Yes
Fund-time fixed effects	Yes	Yes	Yes	Yes	Yes
Country-time fixed effects	No	No	No	No	No
Number of observations	962,344	12,895	286,890	378,626	283,933
R-squared	0.410	0.700	0.299	0.192	0.214
Dependent variable: country flows					
Benchmark weight × fund flows	0.739***	0.854***	0.676***	0.532***	0.381***
	(0.031)	(0.045)	(0.013)	(0.015)	(0.016)
Fund-country fixed effects	Yes	Yes	Yes	Yes	Yes
Fund-time fixed effects	No	No	No	No	No
Country-time fixed effects	Yes	Yes	Yes	Yes	Yes
Number of observations	960,928	12,895	285,897	378,101	284,035
R-squared	0.331	0.770	0.213	0.132	0.130

B. Bond funds					
Dependent variable: country flows					
Benchmark weight × fund flows	0.634***	–	0.730***	0.610***	0.615***
	(0.036)	–	(0.036)	(0.043)	(0.082)
Fund-country fixed effects	No	–	No	No	No
Fund-time fixed effects	No	–	No	No	No
Country-time fixed effects	No	–	No	No	No
Number of observations	59,415	–	25,327	23,440	10,648
R-squared	0.066	–	0.099	0.068	0.049
Dependent variable: country flows					
Benchmark weight × fund flows	0.369***	–	0.683***	0.371***	0.120
	(0.051)	–	(0.053)	(0.065)	(0.113)
Fund-country fixed effects	Yes	–	Yes	Yes	Yes
Fund-time fixed effects	Yes	–	Yes	Yes	Yes
Country-time fixed effects	No	–	No	No	No
Number of observations	59,415	–	25,327	23,440	10,648
R-squared	0.251	–	0.236	0.236	0.274
Dependent variable: country flows					
Benchmark weight × fund flows	0.551***	–	0.748***	0.586***	0.585***
	(0.045)	–	(0.035)	(0.050)	(0.101)
Fund-country fixed effects	Yes	–	Yes	Yes	Yes
Fund-time fixed effects	No	–	No	No	No
Country-time fixed effects	Yes	–	Yes	Yes	Yes
Number of observations	59,773	–	25,327	23,440	10,648
R-squared	0.147	–	0.242	0.186	0.230

This table presents Ordinary Least Squares (OLS) regressions of country flows in billions of US dollars against benchmark weights multiplied fund flows with different sets of fixed effects. Panel A displays results for equity funds and Panel B for bond funds. Funds are divided by fund type and degree of active management. Explicit indexing bond funds are not included due to the low number of observations. Standard errors are in parentheses and clustered at the benchmark-time level. *** denote statistical significance at 10 percent, 5 percent, and 1 percent, respectively

Source: Authors' computations

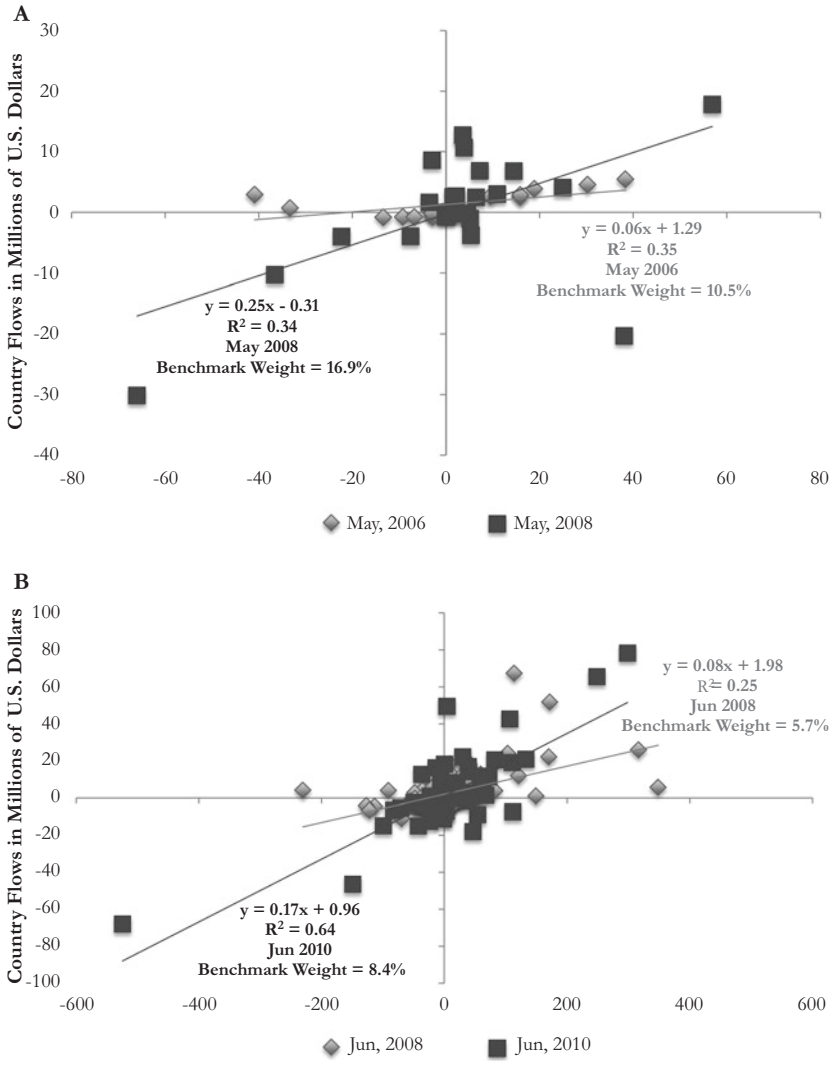

Fig. 12.7 Sensitivity effect of country flows

when we control for different sets of fixed effects. Under this estimation, a change in the benchmark weight changes the sensitivity of country flows to fund flows as indicated above.

There can also be interesting interactions between the sensitivity, amplification, and contagion effects. Notice that changes in benchmark weights (or returns) change the sensitivity of country flows to fund flows. This leads to interesting dynamic interactions between various effects. For instance, a decline in the returns of the rest of the countries sharing a benchmark with country A will induce a higher benchmark weight for country A. But the same increase in benchmark weights makes country A more vulnerable to future movements in fund flows. If in reaction to the initial shock there are large withdrawals of funds, country A would be more affected even though it was the country that performed relatively well. Namely, during good times (when funds are receiving injections), a country that does relatively well gets more country flows. But during bad times, a country that does relatively poorly (its weight decreases) is less affected by the outflows.

Some of these effects can be illustrated by the evolution of country flows to China and Russia from explicit indexing funds following the MSCI Emerging Markets Index, before the global financial crisis and during the European crisis (Fig. 12.8). Before the global financial crisis, China and Russia had similar benchmark weights and flows. However, during the global financial crisis, China did relatively well compared with Russia, which increased its benchmark weight significantly. During the peak of the European crisis, emerging market funds had net withdrawals, which translated into much larger outflows from China than from Russia (proportional to their weights). That is, China was penalized as a result of its stronger pre-crisis performance.

This outcome is the result of the interaction of the sensitivity, amplification, and contagion effects. As China performed well during the global financial crisis, its benchmark weight (amplification) became larger, while Russia's benchmark weight in the index grew but much less (contagion). Thus, the subsequent outflows by investors during the European crisis period translated into higher capital outflows for China than for Russia (sensitivity).

We also illustrate a similar case with Spain and Ireland for the explicit indexing funds tracking the MSCI Europe, Australasia, and Far East Index. Spain and Ireland received inflows during the pre-European crisis, with the former receiving four times more flows than Ireland according to its benchmark weight. Still, Ireland received around USD80 million in that period. Immediately after the crisis, Ireland did relatively worse than Spain, and the subsequent outflows were smaller in Ireland than in Spain.

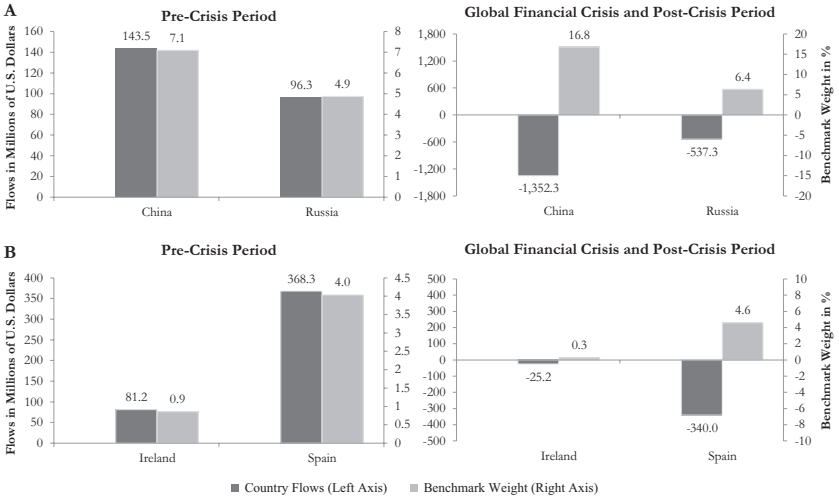

Fig. 12.8 Capital flows and benchmark weights

The various effects described above can interact and build up. A shock to a country's returns increases its benchmark weight and induces inflows through the amplification effect. If these inflows are important enough to have an impact on returns, a feedback loop might be established. Also, a current increase in benchmark weights, either through the direct benchmark effect or other channels will increase the future response of that country's flows to injections through the sensitivity effect. Moreover, with the exception of the direct benchmark effect, other effects could be present for funds that do not follow a benchmark ($\alpha = 0$) through the response of the non-benchmark component to each of the shocks. What is particular about the benchmark effect is that the manner in which benchmarks are calculated guarantees that the response of flows to an own-country shock through benchmarks is positive, and it is negative for shocks to the returns to other countries. For the non-benchmark component, the sign of these responses is indeterminate.

12.5 Conclusions

This chapter provides a detailed illustration of how benchmarks affect international capital flows through different channels that might help explain some of the findings documented in the literature, as well as sometimes counterintuitive and unexpected movements in cross-country investments. First, the reclassification of countries across benchmarks has important reallocation effects on capital flows, and is affected by the size of benchmark investors and the relative importance of countries in these benchmarks. For example, emerging countries tend to have larger weights in emerging market indexes than in developed market ones, because in the latter they share the benchmark with much larger countries. This can provide an explanation of why countries might face capital outflows when upgraded and capital inflows when downgraded. Moreover, the removal of a large country from a benchmark can have consequences in terms of capital flows to the rest of the countries in the same index. These effects might even occur without changes to the fundamentals of a country.

Second, sensitivity, amplification, and contagion effects can occur even when fundamentals or the absolute returns of a country do not warrant them. For example, during global crises, some countries might suffer the curse of being large or having done relatively well. That is, during large retrenchments, countries with larger weights will suffer more withdrawals (although in some cases their larger market capitalization might help them withstand the shock).[9] During generalized declines in asset prices, countries whose stock market indices fall less than other countries in the same benchmark will see their benchmark weight increase and, thus, will be more exposed to subsequent withdrawals by the underlying investors of the funds that follow that benchmark. During good times, when funds receive injections, countries that do relatively well will receive more inflows, witnessing an amplification of the shock that increased its relative return.

More generally, as a country becomes more relevant in a benchmark, it becomes more sensitive to shocks because injections and redemptions have stronger effects on the capital flows to this country. While this effect might be entirely driven by fundamentals (e.g., by the country growing relatively fast), it can also be driven by non-fundamental factors such as bubbles, self-fulfilling expectations, shocks to other countries sharing the same benchmark, or exogenous decisions made by the company constructing the benchmark. For example, if investors suddenly favor a

country and drive its asset valuations upward, the subsequent injections that the relevant mutual funds receive will be more tilted toward this country. This, in turn, might generate more upward pressure on prices, reinforcing the effect. This positive-feedback loop increases as more funds follow benchmark indexes more closely over time, generating pro-cyclicality and possibly explaining (along with other factors) some of the widely documented momentum effect, whereby investment reallocations are related to past returns. Furthermore, the link between benchmarks and market capitalization could create a pro-cyclical bias in benchmark allocations because countries that do relatively well will tend to gain weight in a benchmark relative to the rest.

This chapter presents several new findings that point to further directions in which the research on the effects of benchmarks could likely take. First, the evidence suggests that funds worldwide are becoming less active (Cremers et al. 2016) and the number of benchmarks is increasing rapidly. Therefore, the types of mechanisms documented here are expected to grow over time.

Second, models of international asset allocations and capital flows that use macroeconomic fundamentals and other important factors might start incorporating the type of mechanisms described in this chapter.

Third, benchmarks offer several advantages for researchers. Among other things, they help compare individual portfolios against some well-known specific asset allocations, make portfolio allocations easier to evaluate, and allow for the identification of various effects.

Fourth, although benchmark effects shed light on the behavior of heterogeneous investors, the general equilibrium effects still need to be understood. For example, does the use of benchmarks as a disciplining mechanism coordinate manager decisions across institutions, generating herding, information cascades, and other systemically important effects? Given that some funds try to replicate their benchmark index almost mechanically, do other funds or sophisticated investors anticipate or compensate for their reaction? Are there wealth transfers? Or do they also follow these benchmarks? How do funds manage their active portfolio? What are the effects of benchmarks on capital market financing, the returns to retail investors, and the real economy? These and other questions will likely induce further research in this area.

Notes

1. ICI and OECD have different coverage of mutual funds, so their estimates are not directly comparable.
2. Benchmark weights w_{ic}^{B} are fund specific because each fund chooses its benchmark. We thus denote it with sub-index *i*. The same applies to other benchmark characteristics such as benchmark returns.
3. As in Raddatz et al. (2017), we define different types of funds according to their degree of activism using the active share measure used in Cremers and Petajisto (2009). We classify funds as "explicit indexing," "closet indexing," "mildly active," and "truly active" funds. Explicit indexing funds are those that declare themselves as index funds or ETFs. We then define closet indexing funds as those that on average have an active share within two standard deviations of the active share of explicit indexing funds. Funds not belonging to the explicit indexing or closet indexing groups are classified into mildly active (truly active) if they are in the lower (upper) part of the distribution of the active share measure (using the median active share).
4. More precisely, the buy-and-hold weights are the ones that result only from the impact of the different returns obtained by the various assets that a fund had in its portfolio at the end of the previous period, in absence of any injection/redemption and any active reallocations by the fund manager.
5. The derivations take w_{ict-1} as given and use the following expressions: $w_{ict} = \alpha w_{ict}^{B} + \varepsilon_{ict}$, $R_{ict} = \sum_{c} w_{ict-1} R_{ct}$, and $R_{ict}^{B} = \sum_{c} w_{ict-1}^{B} R_{ct}$.
6. The median country depends on the specific benchmark and time period used. Therefore, different countries represent our median benchmark weight, according to the case being analyzed at that point.
7. This is an approximation because we divide Δf_{ict} by w_{ict-1}^{B}, and thus take it as a percentage of a fund's total assets in a country if it perfectly followed the benchmark.
8. Williams (2017) also uses this framework to estimate the capital inflows to Colombia around a benchmark rebalancing in the J.P. Morgan Government Bond Index and finds that the predictions from Eq. 12.4 are very close to the actual capital inflows in that episode.
9. Whether the larger market capitalization helps will depend, for instance, on whether its pre-shock increase was driven by fundamentals. If instead it was driven by stretched asset valuations, the larger ensuing withdrawals may accelerate price corrections.

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