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Globalization and the geography of capital flows¹

Carol Bertaut, Beau Bressler, and Stephanie Curcuru,
Board of Governors of the Federal Reserve System

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Globalization and the Geography of Capital Flows

Carol Bertaut, Beau Bressler, and Stephanie Curcuru¹

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Abstract:

The growing use of low-tax jurisdictions as locations for firm headquarters, proliferation of offshore financing vehicles, and growing size, number, and geographic diversity of multinational firms have clouded the view of capital flows and investor exposures from standard sources such as the IMF Balance of Payments and the Coordinated Portfolio Investment Survey. We use detailed, security level information on U.S. cross-border portfolio investment to uncover the extent of distortions in the official U.S. statistics. We find that roughly \$3 trillion – nearly a third of U.S. cross border portfolio investment – is distorted by standard reporting conventions. Moreover, this distortion has grown significantly in a little over a decade. Expanding to consider global implications, we estimate that roughly \$10 trillion – about one-fourth – of the stock of global cross-border portfolio investment is similarly distorted. Our results have implications for conclusions we draw about the factors influencing flows to emerging markets, trends in home bias, and the sustainability of the U.S. current account deficit.

Keywords: Balance of Payments, Capital Flows, Financial Globalization, Foreign Assets, International Financial Data

JEL classification: F30, F32, G15

¹ The authors are, respectively, Deputy Associate Director, Senior Research Assistant, and Assistant Director in the Division of International Finance at the Board of Governors of the Federal Reserve System. Matthew Guse, Patrick Kennedy, and Andrew Watrous provided excellent research assistance. The views expressed are solely the responsibility of the authors and should not be interpreted as reflecting the views of the Board of Governors of the Federal Reserve System or of any other person associated with the Federal Reserve System.

1. Introduction

After the global financial crisis, the G20 supported several efforts to produce improved global capital flow and investment statistics, with the goal of a better understanding of cross-border linkages and investor exposures. With respect to cross-border portfolio investment – cross-border flows and positions in bonds and equity – these initiatives included increased participation in the IMF's Coordinated Portfolio Investment Survey (CPIS), and efforts to increase both frequency and granularity of the CPIS, including providing detail on issuer and investor sectors.

However, these efforts to improve the matrix of global portfolio assets and liabilities are not sufficient to gain a thorough understanding of global capital movements due to an ongoing fundamental limitation: These statistics use the official balance of payments (BOP) framework that collects cross-border flows and positions according to *legal residence*. This legal residence concept is increasingly uninformative in a world of increasing globalization and growth in and use of offshore financial centers and tax havens, because there is an increasing disconnect between the legal residence and the economic exposure. Firms issuing securities may not do any business at that legal residence, and thus ownership of such securities may say little about the actual exposures investors face. Thus, even if efforts to improve the country coverage are successful, official statistics will still provide an increasingly distorted view of linkages and economic exposures. Lane and Milesi-Ferretti (2017) provide an overview of the distortionary effects of increasing offshore issuance and financial center intermediation on properly assessing external exposures.

There appear to be two main causes of the firm behavior that lead to the distortions between country residence and economic exposure we observe in the cross-border capital flows and position data. The primary cause is tax considerations. When able, multinational firms locate in the jurisdiction with the lowest tax rate (see for example the survey on the tax competition literature in Keen and Konrad 2013). This is most common for firms with substantial intangible and other portable assets (Desai, Foley, and Hines 2006, Hebus and Johannesen 2016, Pomeroy 2016, Devereaux and Vella 2017, among others). This relocation is responsible for the elevated reported capital flows associated with firms incorporated in Luxembourg and other low-tax jurisdictions. These tax havens are associated with neither firm production nor expenses, so inferring country exposure from standard cross-border statistics is incorrect.

Another main driver of the distortions is firms seeking to improve their access to capital markets and the pool of global bond investors. Many firms, particularly those in emerging market economies (EMEs), issue corporate bonds using a subsidiary firm located in markets outside their home country. For this debt, the residence-based statistics will attribute transactions to the location of the subsidiary. There are many factors driving the use of offshore subsidiaries. Black and Munro (2010) find that companies located in countries with relatively small bond markets issue bonds offshore to improve pricing, access foreign investors, and to issue larger, lower-rated or longer-maturity bonds. Serena and Moreno (2016) identify a pickup in offshore issuance by firms in EMEs following the global financial crisis, which they attribute to

declining financing costs and the less developed state of EME financial markets more generally. However, the longer-term trend since the Asian Financial Crisis in the late 1990s has been away from offshore issuance, which is generally denominated in hard currencies, to local-currency issuance in the domestic bond market (Black and Munro 2010, Mizen et al 2012, Hale et al 2016). While we observe a pick up in the amount of offshore issuance by EMEs, the amount of issuance in the local market is growing even more rapidly.

A separate source of distortion in global statistics arises from the growing importance of mutual funds as a vehicle for cross-border investment. Under international standards, holdings of investment fund shares are classified as equity holdings, and, for cross-border fund holdings, to be assigned to the country of fund incorporation. These standards apply regardless of the focus of the investment fund in terms of either the type of assets that the fund invests in or country of investment focus.

In this study, we construct different measures of country-level holdings and estimates of economic exposures to understand the extent of distortions in existing residence-based portfolio statistics. Many questions of interest to economists and policymakers concern inter-country economic exposures. Similarly, when deciding where to invest, international investors make their decisions based on the economic exposure of a firm, rather than where it is incorporated. For the reasons mentioned above the official statistics are an increasingly poor proxy for economic exposure. To address these concerns, we assign U.S. portfolio holdings to specific countries by three classifications: residence, nationality, and economic exposure. Residence is the standard BOP framework of the legal residence of the entity issuing the security. We define nationality as the location where the ultimate parent of the entity has its center of operations. Finally, we define economic exposure by where the firm does business, in terms of the shares of its sales.

We map the underlying security-level data on U.S. portfolio holdings, collected on a residence basis for the Balance of Payments, to commercial data sources to calculate U.S. holdings on these alternative classifications. First, we use commercial country level investment products designed for international investors, along with ultimate parent data for offshore debt issuance, to convert U.S. portfolio holdings to a nationality basis. Second, we use detailed firm-level information on the geographic distribution of firm sales to provide preliminary estimates of the actual country-level economic exposures of U.S. investors.

We use information on U.S. cross-border investments as a case study, but our results can be generalized to draw conclusions about the extent of global distortions. We find that roughly \$3 trillion – nearly a third of U.S. cross border portfolio investment – is distorted when we compare our nationality-based measures to the standard BOP reporting conventions. Moreover, this distortion has grown significantly in a little over a decade. Expanding to consider global implications, we estimate that roughly \$10 trillion – about one-fourth – of the stock of global cross-border portfolio investment is similarly distorted in our current statistics. Our results have implications for conclusions we draw about the factors influencing flows to

emerging markets, trends in home bias, and the sustainability of the U.S. current account deficit.

The remainder of this paper is organized as follows. Section 2 discusses our findings on the extent of distortion in reported cross-border investment in detail. 2a focuses on U.S. cross-border holdings of bonds and 2 b. on equity. Section 2c extends our analysis to estimate the extent of distortion in global cross-border portfolio investment. In section 3, we discuss implications of documented mismeasurement for analysis of cross-border portfolio flows, and section 4 outlines implications for measures of home bias and factors affecting cross-border portfolio decisions. Section 5 discusses our preliminary findings of economic exposure based on where firms actually do business when we consider the full U.S. equity portfolio, including holdings of domestic securities. Section 6 concludes with a discussion of implications more generally for our interpretations of financial flows and various components of the current account.

2. The extent of the problem: distortions in cross-border portfolio statistics

2a. Increasing use of offshore financing arms and implications for cross-border holdings of long-term debt

The international debt securities statistics produced by the Bank for International Settlements (BIS) illustrate the growing disconnect between residence and nationality measures of debt securities issued via offshore financing arms. International debt securities are primarily those issued in a market other than the home country.² Figure 1a shows international issues of corporate debt outstanding for a selected number of EMEs, with country attribution on the standard balance-of-payments residence basis. According to these statistics, internationally issued corporate debt of these countries totaled about \$900 billion in 2016. The largest EM corporate borrowers in this market were Mexico and Korea, although China has had the fastest growth. Figure 1b shows international corporate debt securities for the same EMEs, but this time with country attribution assigned on a nationality basis. The total amount of bonds outstanding for these countries is now much higher, at nearly \$2 trillion. China is by far the largest issuer, followed here by Brazil and Russia. Figure 1c shows the current differences in these measures.

These differences between the residence- and nationality-based statistics arise because Chinese, Brazilian, and Russian companies primarily issue international debt securities via financing arms located in financial centers, such as the Cayman Islands, Ireland, and Luxembourg. On a residence basis, these securities are allocated to the

² For a detailed discussion of recent enhancements to the BIS international debt securities statistics, see Gruic and Wooldridge (2012) https://www.bis.org/publ/qtrpdf/r_qt1212h.pdf. BIS securities statistics are available at <https://www.bis.org/statistics/secstats.htm>

country where the financing arm is legally resident, similar to the IMF BOP statistics. On a nationality basis, they are recognized as being securities of the ultimate parent firm.

We find that reported cross-border holdings of U.S. bond investors are similarly misrepresented. We conduct our analysis by exploiting the underlying security-level data from the comprehensive reports on U.S. Portfolio Holdings of Foreign Securities, conducted as of end-December 2001 and then annually since 2003.³ These data are collected for BOP purposes, and thus country attribution is assigned on a residency basis. But because we observe the actual securities held, we are able to map U.S. investor holdings from a residence basis to nationality basis.⁴ To investigate the extent of distortion in debt securities, we focus on U.S. investors' holdings of foreign-issued corporate debt, as government debt typically is unaffected by offshore issuance.

Figures 2a and 2b illustrate the growing divergence between the residence- and nationality-based country attribution of U.S. investor holdings. On a residence basis (figure 2a), U.S. holdings of foreign-issued corporate debt securities have risen from about \$300 billion in 2001 to about \$1,700 billion in 2016. By 2016, roughly 40 percent of total holdings consisted of securities issued out of offshore centers or tax havens, an increase from roughly 30 percent in the early 2000s. Holdings of EME corporate debt account on average for about 8 percent of U.S. holdings of foreign corporate debt.

On a nationality basis (figure 2b), however, holdings of foreign corporate debt securities have risen less, reaching only about \$1,300 billion in 2016. The lower value largely reflects increased issuance by financing arms of U.S. corporations established in offshore centers. Bonds of such U.S. entities accounted for nearly a quarter of "foreign" issued debt held by U.S. investors in 2016. That said, U.S. holdings of the debt of some other countries and regions are substantially understated. In particular, EME corporate debt holdings are notably higher on a nationality basis and have grown faster in recent years. By 2016, our estimate of U.S. investment in EME corporate debt is 60 percent higher than under the residence-based statistics. Overall, offshore issuance currently distorts the geography of more than a third of U.S. holdings of foreign corporate debt.

Figures 2c and 2d illustrate how residence-based statistics can distort estimates of changes in investor preferences and portfolio allocations. On a residence basis

³ These surveys are conducted through the Treasury International Capital System, a joint undertaking of the U.S. Treasury Department, the Federal Reserve Bank of New York, and the Board of Governors of the Federal Reserve System. Earlier surveys were also conducted in 1994 and 1998. Although referred to as "surveys", data reporting is mandatory. Further information about the surveys, including the survey reports and instructions, are published on the U.S. Treasury's website: <https://www.treasury.gov/resource-center/data-chart-center/tic/Pages/index.aspx>

⁴ We are grateful to our colleague Seung Jung Lee and his coauthors for their fuzzy text matching code to enable us to identify and match the individual securities, as many were not reported with standard security IDs, especially in earlier years. See Cohen et al (2018).

(figure 2c), U.S. investors appear to have allocated a much larger share of their portfolios to Mexican corporate debt than to Brazilian corporate debt, and own essentially no Russian corporate debt. On a nationality basis (figure 2d), however, U.S. investors' holdings of Brazilian debt rival and at times exceed those of Mexican debt.⁵ The nationality-based holdings also show that U.S. investors have non-trivial holdings of the Russian corporate sector, a finding completely missed in residence-based holdings statistics.

2b. Distortions in cross-border equity holdings

For cross-border equity holdings, two factors contribute to the major disconnect between residence-based statistics and economic exposures. First, as noted in the introduction, many large multinational firms have found it advantageous to incorporate in tax-favored jurisdictions, which becomes their legal residence. For many firms there are little or no operations or sales in the country of incorporation, so there is no economic exposure to that country. Second, investment fund holdings are attributed to the countries where the funds are incorporated, which is often driven by tax considerations. These country allocations are also often unrelated to actual investor exposures. We estimate the distortions created by these two factors below by mapping residence-based holdings to nationality-based portfolios.

2b1. Common Stock

Distortions in estimates of exposure based on the residence-based geography of U.S. cross-border equity holdings arising from large multinationals incorporating in lower-tax jurisdictions is not a new phenomenon. For example, Schlumberger – long one of the largest 100 global firms – has been operating in the U.S. since the 1930's and is headquartered in Houston, Texas, but has been incorporated in Curaçao since 1956.⁶ As a result, the U.S. cross-border statistics show that U.S. investors have had large holdings of Netherlands Antilles/ Curaçao equity for some time. These distortions have become more pronounced in recent years following a wave of cross-border mergers and corporate "inversions", whereby former U.S.-resident firms have become foreign-resident firms after the merger.⁷ For example, following recent high-profile inversions in the pharmaceutical industry such as Actavis/Allergan and Medtronic/Covidien, the equity of several major U.S. firms is now considered "Irish"

⁵ Note, however, that our estimates of total U.S. holdings of Mexican corporate debt are most likely somewhat understated in the pre-crisis years, even on a nationality basis, because at that time Petroleos Mexicanos (PEMEX) also issued debt out of a U.S. (Delaware) financing arm, PEMEX Project Master Funding Trust. Ideally, we would want to include U.S. investor holdings of these Delaware-issued PEMEX bonds to our estimates of Mexican corporate debt on a nationality basis. Unfortunately, the U.S. claims surveys that are the basis of our analysis do not include securities issued from Delaware financing arms, because such securities are considered U.S. securities.

⁶ <http://www.fundinguniverse.com/company-histories/schlumberger-limited-history/>

⁷ "Inversions" refer to M&A activity where the acquiring firm is typically larger than the target firm. After the merger, the combined firm "inverts" to establish its residence in the country of the target firm, which is typically a lower-tax jurisdiction.

equity according to official statistics. Adding to these distortions has been the increasing presence of EME firms incorporated in the Caribbean. This is especially notable for some large Chinese firms including Alibaba, Baidu, and Tencent.

Residence-based statistics for cross-border equity holdings are thus imperfect estimates of portfolio exposures. Commercially available country-level investment products designed for international investors do not rely on residence for determining country allocation, and instead match firms to countries based primarily on the location of operations. This leads to large differences between the country-assignment of firms in the residence-based statistics and mutual fund industry benchmarks such as MSCI or FTSE Global indexes. MSCI continues to treat Medtronic as a U.S. firm despite its incorporation in Ireland since its merger with Covidien in 2015, because its operations are largely U.S.-based and its shares continue to trade on the NYSE. And since December 2015, MSCI has included Alibaba and Baidu in its EME/China indexes, although they are both incorporated in the Cayman Islands and their shares trade on the NYSE and the NASDAQ, respectively.

Similar to our exercise for reassessing country exposures by reassigning bonds issued offshore to the country of ultimate parent, we use the underlying security-level data to reassign U.S. holdings of foreign common stock according to constituent information for the MSCI. We are able to do so for the years 2005 through 2016.

Figures 3a and 3b show the evolution of U.S. holdings of foreign common stock according to standard residence-based country attribution (figure 3a) and nationality-based attribution (figure 3b). As we found with U.S. investment in foreign bonds, an increasing source of distortion arises from firms that the MSCI classifies as "U.S." but are legally incorporated outside the United States. This share has grown from less than 10 percent in 2005 to 16 percent in 2016, totaling more than \$900 billion. U.S. holdings of EME equity are also considerably larger by MSCI definitions, in large part reflecting the classification to EMEs of large Chinese firms incorporated in offshore centers. Overall, we find that by 2016, roughly \$1.3 trillion – nearly a fourth – of U.S. holdings of foreign common stock was attributed by official statistics to a country different from its country of nationality as classified by MSCI.

2b2. Fund shares

Fund shares add additional layers of distortion. International standards call for holdings of investment fund shares to be reported as equity holdings, and, for cross-border fund holdings, to be assigned to the country of fund incorporation. These standards apply regardless of the focus of the investment fund in terms of either type of assets the fund invests in (stocks, bonds, commodities, derivatives, money market instruments, or mixed allocations) or country of investment focus. So for fund shares, there is a mismatch between the country of residence and country of nationality, similar to what we observe for bonds and equities. But there is the additional problem of misallocation to security type.

To investigate the potential distortions in fund share holdings, we again use the detailed holdings from the U.S. claims surveys. About 15 percent of the foreign equity held by U.S. investors – \$1.2 trillion as of 2016 – is in the form of fund shares and types of equity other than common stock. The fund and other equity share is much

higher for equity holdings in financial centers: 77 percent for the Cayman Islands, 82 percent for the British Virgin Islands, and 53 percent for Luxembourg. The underlying data indicate that U.S. investments in foreign-issued funds consist of a wide variety of assets and exposures, including ETFs that track the S&P 500 and other U.S. stock indexes, funds that invest in U.S. Treasuries, and a variety of real estate focused funds, emerging markets funds, and commodities-focused funds. About \$450 billion consists of securities of various private equity funds. These funds are especially opaque in their portfolio allocations, but it is unlikely that they represent exposures to the Cayman Islands, for example. Indeed, many of these private equity holdings may reflect corporate investments in the United States.

We can gain some information on the underlying investments of Cayman Islands-based investment funds from Cayman Island's submissions to the CPIS.⁸ Beginning in December 2015, these submissions have included assets held by investment funds resident in the Cayman Islands. Total reported cross-border portfolio holdings are roughly \$1.6 trillion as of December 2016, with more than half (a little over \$900 billion) in debt securities and the remainder in cross-border equity. About 70 percent of these holdings are of U.S. securities. About 15 percent is securities issued by other advanced economies and the residual 15 percent all other countries, including EMEs.⁹

Similar information on the assets underlying fund shares held by global investors is available for Luxembourg. The Central Bank of Luxembourg publishes monthly information on the broad asset classes held by non-monetary funds established in Luxembourg.¹⁰ Total assets of these funds amounted to nearly \$2.9 trillion at end-2016. As a share of total assets held, just under a third of these funds are as equity funds, a slightly larger share (36 percent) are bonds funds, and just under a quarter are mixed bond-equity funds. The remaining 10 percent are hedge funds, real estate funds, and other funds. For equity, bond, and mixed funds, the data indicate that only about a third of securities held as assets of the fund were issued in the euro area. About 27 percent are U.S. securities. Another 10 percent are securities issued by other European Union countries, about 4 percent were Japanese securities, and about a quarter from other countries including emerging markets.

While it is difficult to determine precisely the nationality-based country exposures that U.S. holdings of foreign fund shares represent, it is clear that that they are not primarily exposures to the economies of the Cayman Islands or Luxembourg, where the majority of these funds are located. To quantify the distortion in total U.S. investment in foreign funds and other types of equity, we make a conservative assumption that only U.S. holdings of fund shares and other equity located in the

⁸ Details on CPIS reporting results are available at this link: <http://data.imf.org/?sk=B981B4E3-4E58-467E-9B90-9DE0C3367363>.

⁹ Prior to the inclusion of the holdings of investment funds, the Cayman Islands reported only security holdings of Cayman-resident banks, and consequently their total reporting to the CPIS was much lower. For example, the Caymans reported only \$61 billion in cross-border assets to the CPIS in June 2015.

¹⁰ http://www.bcl.lu/en/statistics/series_statistiques_luxembourg/13_investment_funds/index.html

Caribbean and only half of such equity located in European countries reflects underlying assets of another location. Even under these conservative assumptions, fund share holdings add nearly \$1 trillion to the distortion in U.S. foreign portfolio statistics in 2016.

Combining our findings for U.S. cross-border investment in bonds, common stock, and fund shares, we estimate that nearly \$3 trillion of the total \$9.6 trillion in foreign portfolio securities held by U.S. investors in 2016 reflected exposures to countries other than as reported in the official statistics (table 1). Comparing 2016 results with 2005 shows how much these distortions have increased in just over a decade: In 2005, only a little over \$800 billion of U.S. holdings of foreign securities reflected investment in a different country of exposure.

2c. Implications for global cross-border distortions

Global statistics provide similarly misleading estimates of country exposures. While U.S. and foreign investor portfolios certainly differ in terms of portfolio allocations and country concentrations, geographic misallocations arise primarily through holdings of securities issued via offshore centers. Because U.S. investors in aggregate are likely representative of global investors in terms of these offshore holdings, we are comfortable in drawing conclusions about global distortions from our analysis of U.S. holdings.

Overall, we estimate that nearly a quarter – almost \$10 trillion – of the aggregate cross-border holdings of bonds and equity as reported in the IMF's CPIS for 2016 likely reflect holdings of a different country than reported (table 2).¹¹ For bonds, we estimate that more than \$2.5 trillion of the roughly \$20 trillion reported is affected. Distortions are larger for global cross-border equity holdings, in large part because of the growing importance of fund shares, as evidenced by the growing importance of holdings in Luxembourg and the Cayman Islands. These two countries are the second and third largest destinations for cross-border equity investment after the United States, according to the CPIS. We estimate that more than \$7 trillion of the roughly \$20 trillion in cross-border equity and investment fund holdings reported in the CPIS for end-2016 are distorted by residence-based reporting.

Estimates for some countries and regions of particular interest to global policy makers are especially distorted. We estimate that global holdings of EME bonds and equity in the CPIS are understated by about \$1.5 trillion, reflecting both corporate bonds issued via offshore financing arms and the growing market cap of emerging market firms incorporated in offshore centers. Global holdings of U.S. securities are also understated, owing to the legal incorporation of U.S.-based multinationals in low-tax jurisdictions, as well as the investments of funds located in offshore centers. Securities holdings of other advanced economies, including Germany, Italy, and Spain are also likely understated, because their firms frequently issue debt securities via Luxembourg and Netherlands financing arms.

¹¹ We exclude SEFER (reserves) holdings from this analysis. Foreign exchange reserves holdings are primarily invested in sovereign debt, which is largely unaffected by these considerations.

3. Implications of geographical distortions in interpreting balance of payments flows:

These differences between as-reported country of residence and country of nationality are important for how we interpret developments in capital flows. Figures 4a and 4b show total U.S. purchases of foreign bonds and foreign stocks on a residence basis. The figures decompose purchases into those of “true” foreign securities and those of securities where the ultimate parent or center of operations is actually in the United States.

Figure 4a illustrates that in the lead-up to the 2007-2009 global financial crisis, roughly a third of the foreign bonds acquired by U.S. investors were actually purchases of U.S. assets. In large part, these were purchases of asset-backed securities issued by special purpose vehicles established by U.S. financial institutions in the Cayman Islands, and of which the underlying assets were U.S. mortgages. Purchases of “true” foreign bonds did increase over this period, but not as dramatically as the residence-based statistics indicate. The adjusted flows also paint a somewhat different picture of U.S. purchases of foreign bonds in more recent years: purchases of “true” foreign bonds are a noticeably weaker in 2014 and 2016 and more than account for the foreign bond sales in 2015. Figure 4b shows that purchases of “true” foreign equity – excluding securities of firms that MSCI includes as U.S. – are also smaller. Indeed, they are only about half as large in the past couple years.

However, there are also differences within our adjusted purchases of foreign securities. Figures 4c and 4d show purchases of EME bonds and stocks on both a residence and nationality basis. On a nationality basis, U.S. purchases of EME bonds are stronger in earlier years, but sales in recent years are also somewhat larger. Purchases of EME equity are larger through 2015 (especially in 2014 and 2015), but indicate that U.S. investors actually sold EME equity in 2016.

4. Implications of distortions for measures of home bias and our understanding of global investment decisions

4a. Measures of Home Bias

The distortions we identify affect how we think about evolving investor preferences, including measures of “home bias” and the drivers of portfolio allocations. “Home Bias” refers to the lack of diversification of international investors relative to the optimal holdings implied by the International Capital Asset Pricing model (ICAPM). The ICAPM predicts that in a world with frictionless markets the optimal asset allocation is the world portfolio; in other words, investors should spread their wealth among global equities according to each asset’s share of global market capitalization. For example, since U.S. equities currently make up about 40 percent of global market capitalization, about 40 percent of U.S. investors’ equity holdings should be in U.S. stocks.

The basic calculation for home bias thus compares portfolio allocations in foreign (to the investor) equity to shares in global market capitalization:

$$\frac{\frac{(\text{holdings of foreign equity})}{(\text{total equity portfolio})}}{\frac{(\text{foreign equity market cap})}{(\text{world equity market cap})}}$$

Note that if portfolio shares are close to or equal market capitalization shares, this ratio will be close to one. This ratio is typically subtracted from 1 to measure “home bias”, so that the larger this ratio, the greater the extent of home bias:

$$1 - \frac{\frac{(\text{holdings of foreign equity})}{(\text{total equity portfolio})}}{\frac{(\text{foreign equity market cap})}{(\text{world equity market cap})}} \quad (1)$$

In reality, investors in the U.S. and across the globe hold much larger shares of their wealth in domestic assets than predicted by the ICAPM. There is a large literature on the potential causes of home bias, which include hedging motives arising from exchange rate and other risks, and frictions such as transactions costs as well as easier access to and better information about domestic markets. Coeurdacier and Rey (2013) provide a comprehensive survey of this literature. This literature focuses on factors that affect investor demand for exposure, and the associated characteristics of investment in different countries. Thus, there can be a mismatch between the theory and home bias calculations calculated using residence rather than nationality-based measures.

Research into home bias generally finds that factors such as better information (as proxied by common language and trade linkages) as well as easier market access (for example, through issuance of depository receipts and cross-listing) help reduce home bias. Indeed, several studies have shown that measures of home bias have declined over time, consistent with easier access to information about foreign markets (Sorensen et al. 2007, Bakaert and Wang 2009, Cooper et al. 2013).

However, our results indicate that residence-based statistics have tended to overstate recent declines in U.S. home bias. Figure 5 shows our estimates of U.S. home bias in common stock, where the definition of “foreign” is computed on both a residence basis and on an nationality basis as designated by MSCI. We draw a couple relevant conclusions. First, U.S. home bias in equity is more pronounced on the nationality basis than on a residence basis, reflecting the fact that equity of large multinationals considered “foreign” to the U.S. on a residence basis are considered to be investment in the U.S. by MSCI. Second, home bias has not declined materially by either measure, at least not since the financial crisis. In fact, home bias appears to have been drifting back up in recent years, especially on the nationality basis, casting doubt on the narrative that improved access to information about foreign markets has contributed to a decline in home bias more recently.

We find that U.S. home bias in bonds is similarly more pronounced on a nationality basis than on a residence basis (figures 6 a-d), though by both measures there is a declining trend. Home bias in financial sector bonds has declined less post-crisis on an ultimate parent basis (figure 6c), with a noticeable gap opening up

between the two years. Home bias has declined more noticeably for nonfinancial corporate debt (figure 6d) on both measures, but the level is decidedly higher on an ultimate parent basis. This is because, as shown in figure 2b, a significant amount of what is reported in the residence-based statistics as U.S. holdings of foreign debt is actually debt issued by U.S. nonfinancial firms through an offshore subsidiary. There has been essentially no decline in home bias in government bonds (6b), which are unaffected by residence versus ultimate parent considerations.

4b. Implications for understanding the factors influencing cross-border portfolio allocations

We can shed some further light on how conclusions about the drivers of home bias and international portfolio flows more generally may be misleading when based on residence-based statistics by looking at country-level *relative* portfolio weights. As with overall home bias, we can construct measures of relative portfolio weights in different countries as:

$$\frac{\frac{(\text{holdings of country } i \text{ equity})}{(\text{total equity portfolio})}}{\frac{(\text{country } i \text{ total equity market cap})}{(\text{world equity market cap})}} \quad (2)$$

Larger values again imply weights closer to the market cap shares, and smaller weights imply greater underweighting relative to market cap shares. These measures can differ on a residence and exposure basis through differences in the share of the portfolio assigned to *country*_{*i*}.

To illustrate how the differences between residence-based and nationality-based weights can affect the conclusions one might draw about the factors affecting portfolio decisions, we estimate a simple gravity-type model of U.S. relative weights in foreign equity, similar to that of Fidora et al. (2007). Our left hand side variable is the measure of relative portfolio weight in a given county's equity given by equation (2). We construct this measure two ways: on a standard BOP residence basis, and on our recalculated MSCI country of nationality basis. We include variables standard in the gravity model literature including distance, measures of "information" and market access, financial development, and trade shares. Following Fidora et al. (2007), we also add measures of equity market and GDP correlation to control for diversification motives.¹² Our resulting panel is for roughly 40 countries and 12 years. An appendix lists the estimation model and describes the independent variables.

The conclusions inferred from the model estimation about the drivers of international portfolios are different using the BOP versus MSCI country allocations. Table 3 summarizes our results. Trade linkages appear far more important (both

¹² Our goal is not to defend this particular model (for example, we are not able to control for cross-listing or other measures of market access found to be important in similar portfolio weight regressions by Ahearne, Grier, and Warnock (2004)), but rather to point out how strikingly different the results are simply by our different relative weight measures.

statistically and economically) in the MSCI nationality regressions than in the standard BOP residence regressions, whereas the opposite is true for the diversification measures. Most tellingly, proximity, common language, and common legal origin are all far more important in the residence-based regressions. These results suggest that these particular factors may be more important for the choice of where firms incorporate, and tell us less about what matters for investors' portfolio allocations.

4c. Additional implications for analysis of capital flows to Emerging Markets

Our results have additional implications for how we think about factors influencing capital flows to EMEs. For example, there has been much focus on the global impact of the extraordinary policy actions undertaken by advanced economy central banks in the wake of the global financial crisis. Of particular emphasis has been how these monetary policies spill over into emerging markets and how asset prices in emerging markets will react when these policies are reversed (Bowman et al 2015, Fratzscher et al 2018, Curcuru et al 2018). Our results showing the mis-measurement of capital flows to EMEs – with stronger flows when policy was especially accommodative and somewhat weaker flows as policy has begun to tighten – suggest that the impact may be understated.

Additionally, our results weaken the argument that capital flows arising from foreign direct investment (FDI) are generally preferable because they are less volatile than portfolio flows. Reasons in support of this conclusion are that FDI is harder to expropriate (Albuquerque 2003) and driven by pull rather than push factors (Eichengreen et al 2018). However, these arguments assume that portfolio flows in the BOP accounts fully capture investment in a country's securities. When foreign residents buy bonds issued onshore, these purchases will show up as portfolio investment inflows. When corporations issue bonds via offshore affiliates, however, funds borrowed through the offshore entities are funneled back to the parent firm in the form of lending or "reverse investment" in the parent firm. These flows will appear as FDI inflows. These funds are effectively no different from typical portfolio flows, and will be just as volatile. Growing reliance on offshore financing vehicles for debt issuance could thus confound our understanding of the resilience of different types of cross-border financial flows.

Our results also raise some potential flags for interpreting conclusions on the effectiveness of capital controls for preventing portfolio inflows to emerging markets (Forbes and Warnock 2012; Ahmed and Zlate 2014; Forbes et al. 2014; Forbes et al 2015; Pasricha et al. 2015). Foreign investors may still be able to gain exposures to countries via offshore-issued bonds, which typically are unaffected by controls. But because their purchases are not classified as portfolio inflows to these countries, the effectiveness of the controls may be overstated.

5. Determining economic exposure in terms of where firms actually do business

Thus far, we have documented significant challenges in understanding investor motivations and portfolio allocations by comparing the results of our restated

nationality-based statistics with standard residence-based country allocations. However, even these restated portfolios do not fully capture country exposures, because investors gain additional exposures through the global activities of multinational firms. To provide a sense of how important these full exposures are, we take the additional step of calculating the geography of economic exposures of individual firms, focusing on common stock equity of firms for which we have access to information on the geography of their sales.

For this exercise, we consider the full U.S. equity portfolio, including holdings of foreign as well as domestic stocks, as in our calculations of home bias. We map our firm-level individual securities to firm-level Worldscope data to identify the major geographic regions of each firm's sales.¹³ We then allocate U.S. investor equity holdings by three broad regions: the United States, emerging markets, and other foreign countries.

Figure 7 compares our results for the aggregate U.S. portfolio by each of our three classifications: residence, nationality, and sales exposure. Overall, we are able to classify a total U.S. portfolio of roughly \$25.6 trillion as of December 2016. On a residence basis, holdings of U.S. firms amount to about \$21 trillion. On a nationality basis, holdings of U.S. firms increases to \$21.7 trillion, reflecting our reclassification of the holdings of equity of U.S. multinationals incorporated in offshore centers, as discussed in section 2b1 above. Holdings of emerging market equity are also slightly larger, as also discussed previously.

In contrast, estimated economic exposures to the United States based on sales are considerably smaller at \$16.3 trillion, though they remain the largest portion of the total portfolio. This smaller share reflects the fact that large-cap U.S. firms are global in reach and thus holding their shares provides considerable international exposure. Estimated exposures to EMEs and other foreign countries are correspondingly higher. Of course, the reduced exposure to the United States from these calculations is offset in part by a reallocation of some of the holdings of foreign equity: foreign multinationals often have significant operations in the United States, and thus U.S. investors acquire some U.S. exposure through their holdings of foreign stocks.

Our results here thus raise questions about how investors view their equity portfolios in terms of actual country-level economic exposures, and how readily they adjust their portfolio holdings of both domestic and foreign securities when faced with foreign shocks. For example, stock prices of internationally-exposed U.S. firms certainly respond to foreign shocks and developments such as dollar appreciation (see Bertaut and Sinha 2015). These calculations also raise questions about the notion of "home bias" and how it has evolved over time, as large-cap domestic firms that make up the bulk of investor portfolios are increasingly global in scope. Extending

¹³ Our claims surveys only collect security-level information on U.S. holdings of securities issued by foreign-resident firms. To estimate U.S. investor holdings at the security level of U.S.-resident firms, we start with the market capitalization of each firm, and subtract those security-level holdings that we know are held by foreign investors from the complementary annual U.S. portfolio surveys of foreign investors.

these exposure-based estimates back through time should provide further insights to these questions, and is the subject of ongoing research.

6. Concluding remarks: Implications of globalization for the analysis of the composition of financial flows and for Current Account sustainability

We have shown that as-published statistics on cross-border portfolio flows and measures of investor exposures are increasingly distorted by firms' choices of where to establish legal residence and from what location to issue securities. We have highlighted some of the ways these distortions can affect conclusions we draw about the factors influencing investor decisions and portfolio allocations. These distortions also have broader implications for how we think about the composition of financial flows and other components of the international accounts.

In addition to the implications discussed in section 4, our results have implications for other areas of international finance. They are relevant to the long-standing Lucas (1990) paradox, which arises from differences between the theoretical prediction of movements between developed and developing countries, and what is observed. Theory predicts that capital should move toward economies with lower levels of capital per worker. Contrary to this theory, most studies find that capital does not flow from more to less developed economies; rather, it flows in the other direction (see Alfaro et al. 2008, among others). Our results suggest that advanced economy exposure to EMEs is larger than previously believed, which resolves some portion of this puzzle. This is perhaps especially evident when we consider the global reaches of large multinational firms.

Finally, our results are relevant for analysis of the sustainability of the U.S. current account deficit. For example, future values of the U.S. net international investment position depend importantly on the composition of the underlying assets and the income generated by them (for example, see Ahmed et al. 2018). The net impact on sustainability is not clear, as some of the large investment income received by U.S. multinationals would be offset by the effect of a lower trade deficit in the absence of large transfers of intangible assets to foreign subsidiaries (Güvenen et al. (2017)). This important issue requires further study.

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Figure 1a. BIS International Debt Securities Corporate Debt Outstanding for Selected EMEs: By Residence

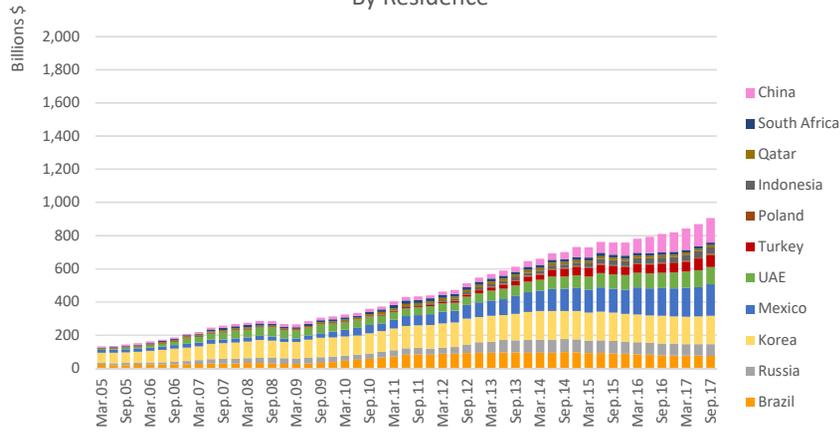


Figure 1b. BIS International Debt Securities Corporate Debt Outstanding for Selected EMEs: By Nationality

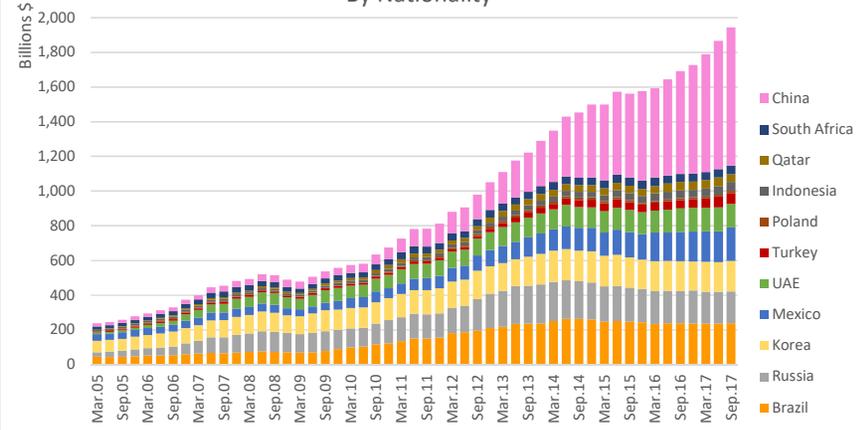
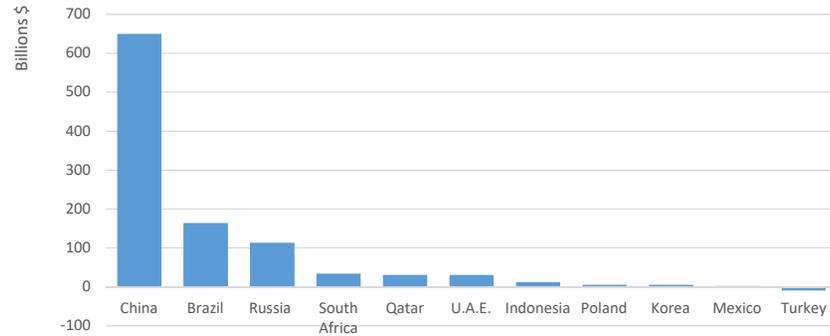


Figure 1c. Difference in International Corporate Debt Securities Outstanding, Residence vs Nationality Basis, for selected EMEs Sept. 2017



Source: BIS debt securities statistics, International Issuances, <https://www.bis.org/statistics/secstats.htm>

Figure 2a. U.S. holdings of foreign corporate debt, by residence (Billions of \$)

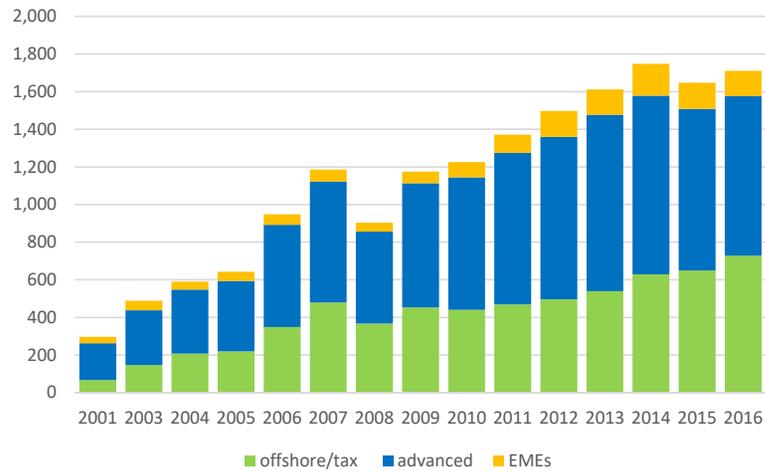


Figure 2b. US holdings of foreign corporate debt, by nationality (Billions of \$)

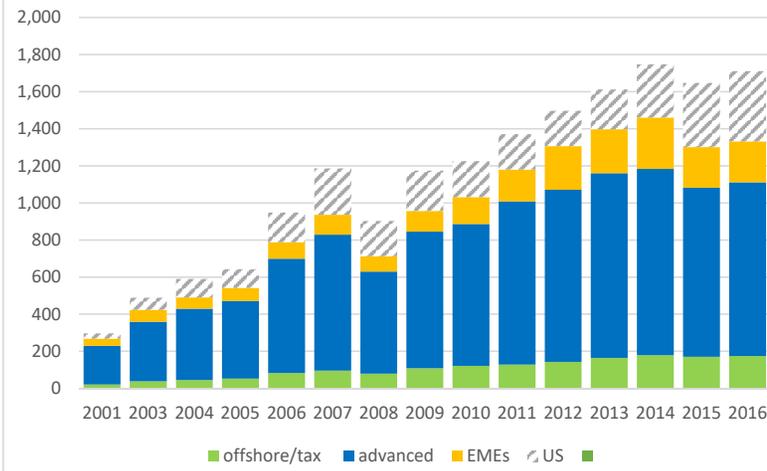


Figure 2c. U.S. holdings of selected EME corporate debt, by residence (millions of \$)

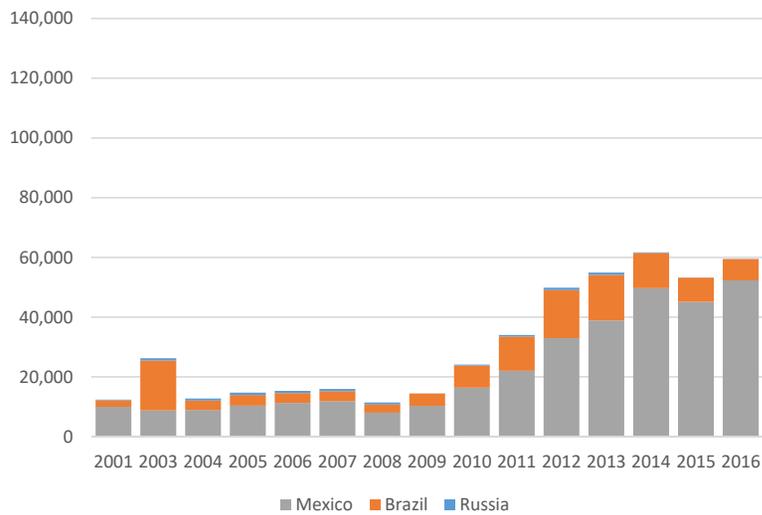
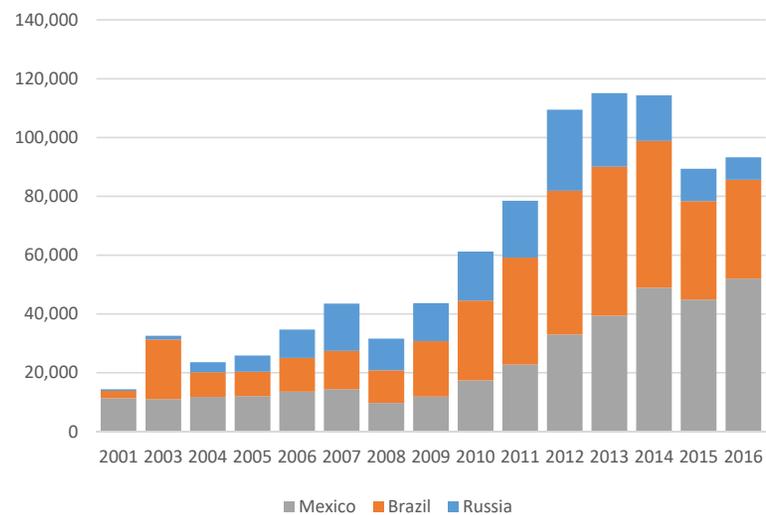
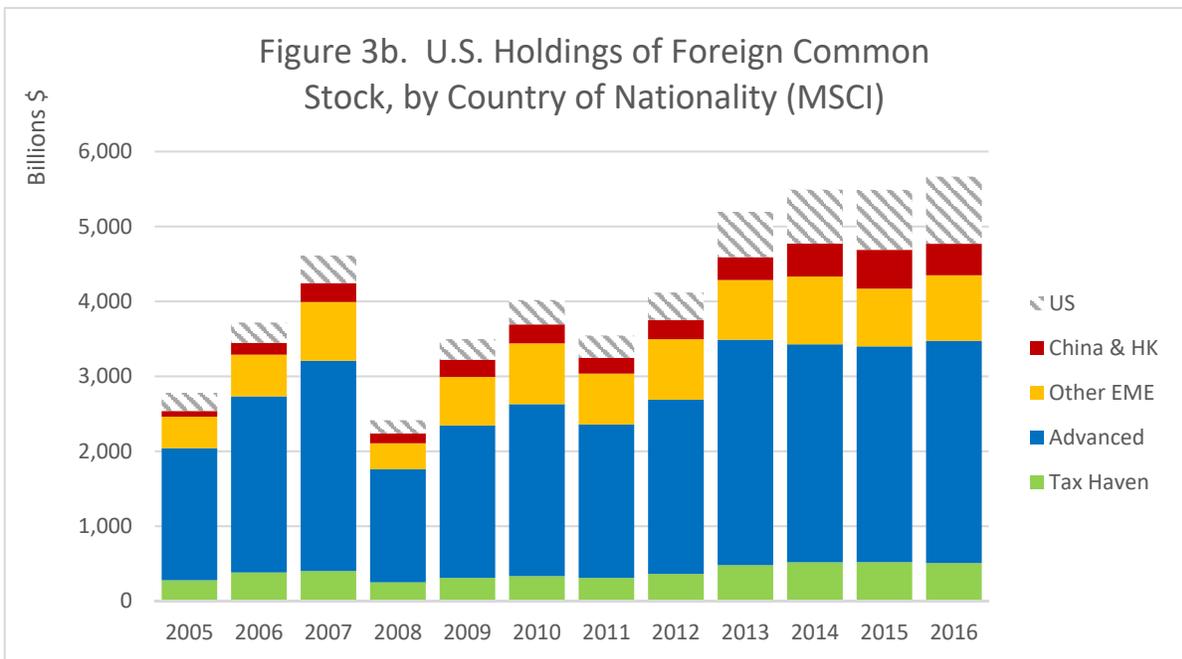
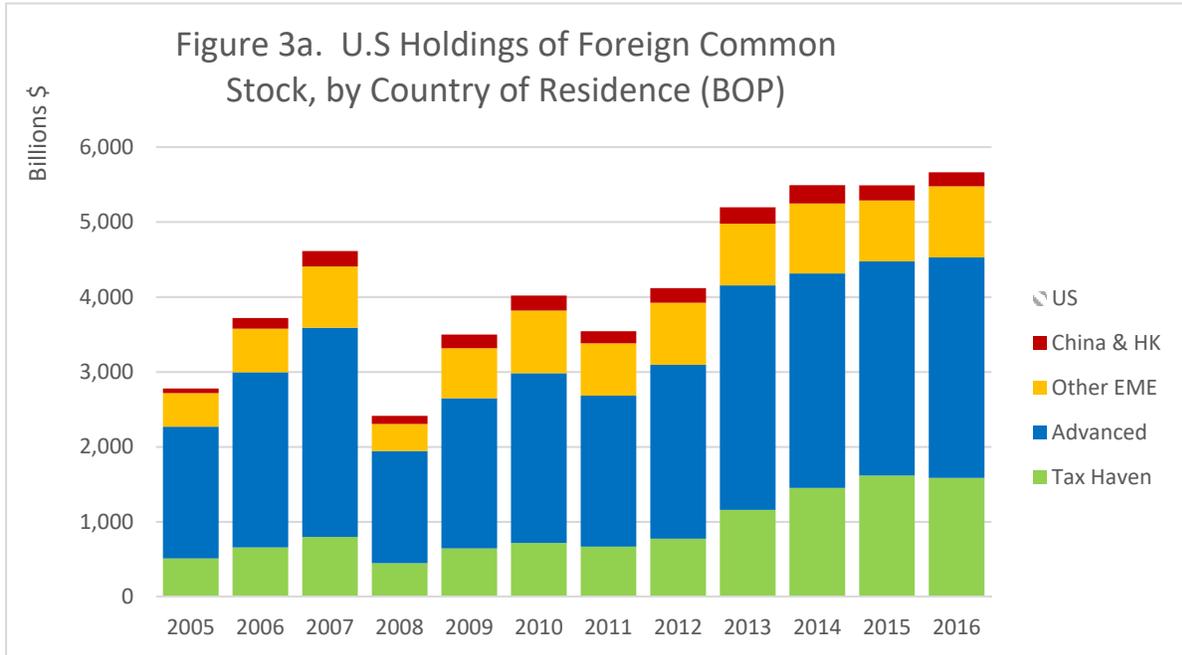


Figure 2d. U.S. holdings of selected EME corporate debt, by nationality (millions of \$)



Source: Authors' calculations from Treasury International Capital, Surveys on U.S. Portfolio Holdings of Foreign Securities, various years.



Authors' calculations from Treasury International Capital, Surveys on U.S. Portfolio Holdings of Foreign Securities, various years.

Figure 4a. U.S. investors net purchases of foreign bonds

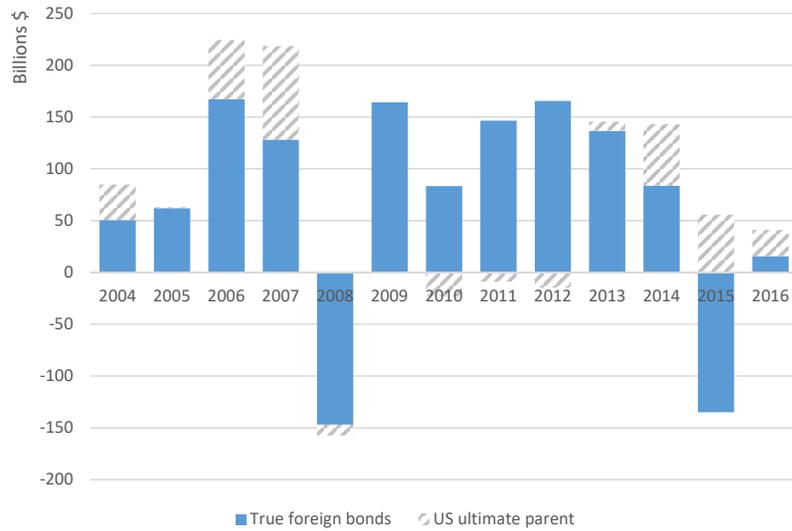


Figure 4b. U.S. investors net purchases of foreign stocks

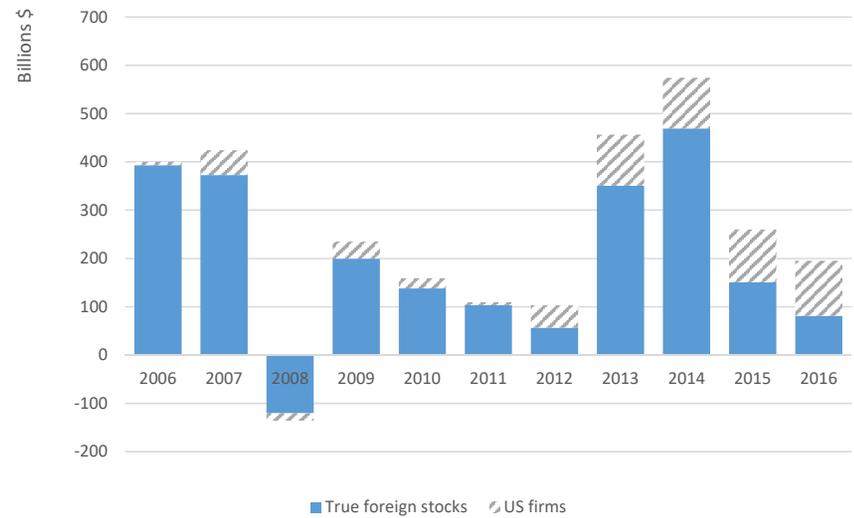


Figure 4c. U.S. net purchases of EME bonds

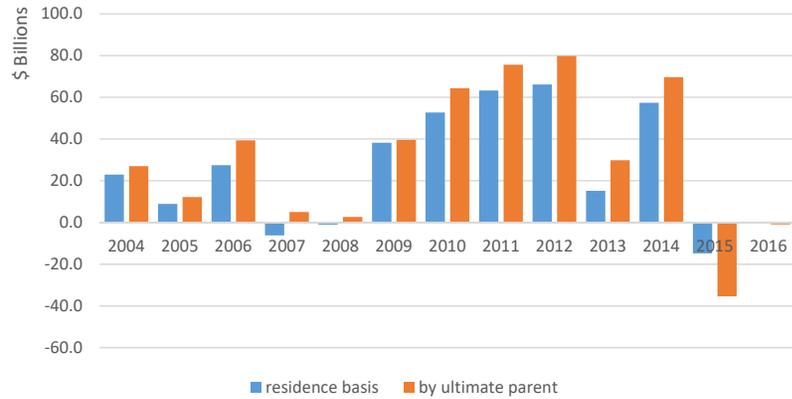
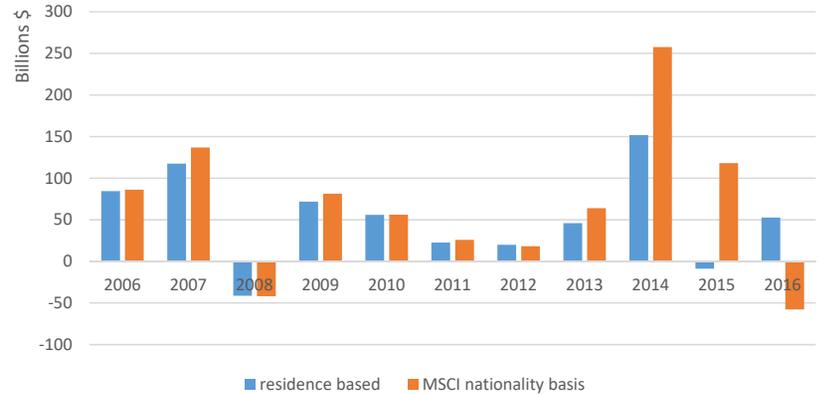


Figure 4d. U.S. net purchases of EME equity



Source: Authors' calculations from Treasury International Capital, Surveys of U.S. Portfolio Holdings of Foreign Securities, various years.

Figure 5. U.S. home bias in common stock

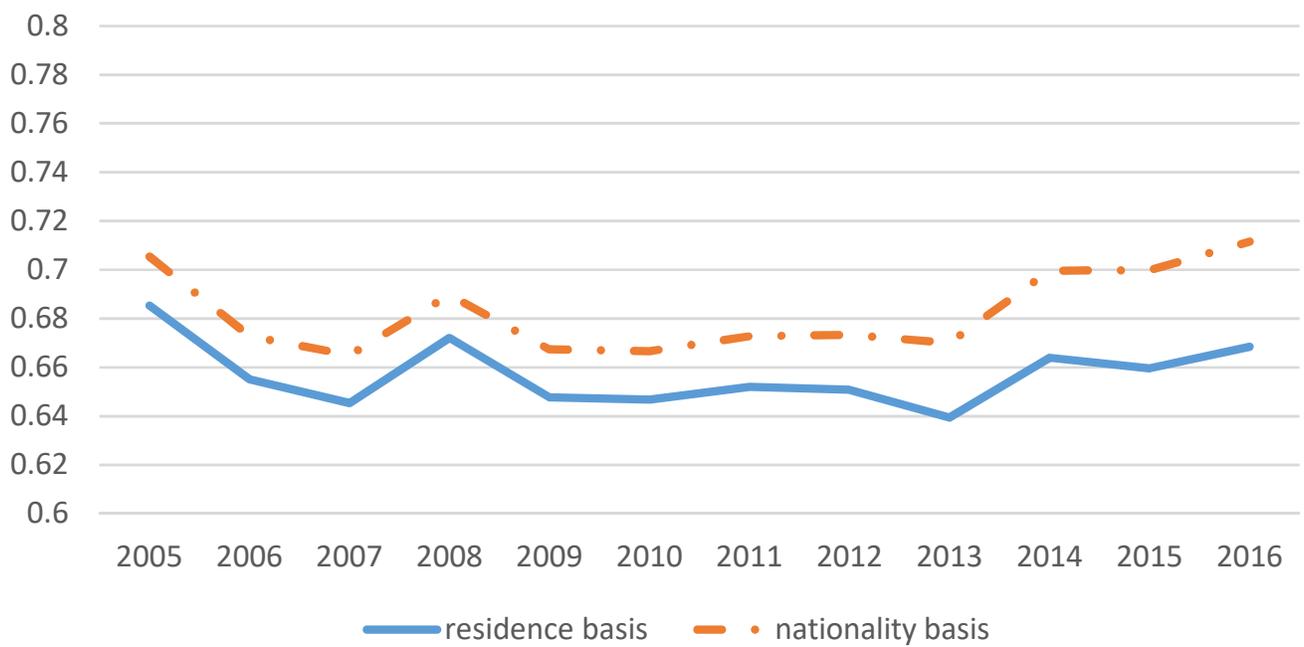


Figure 6a. US home bias in total bonds

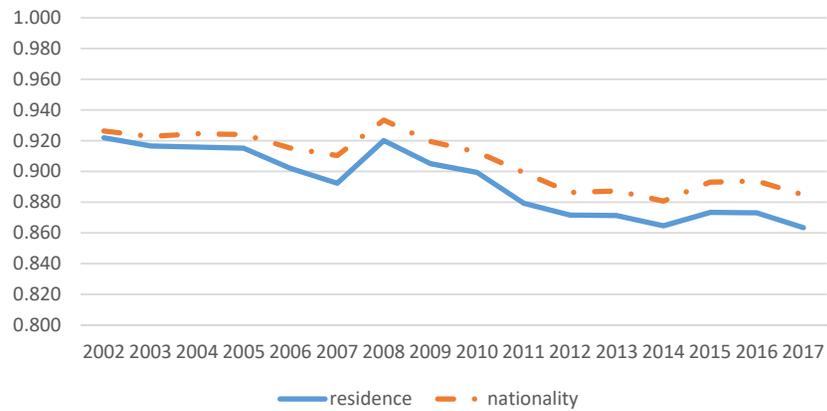


Figure 6b. US home bias in government bonds

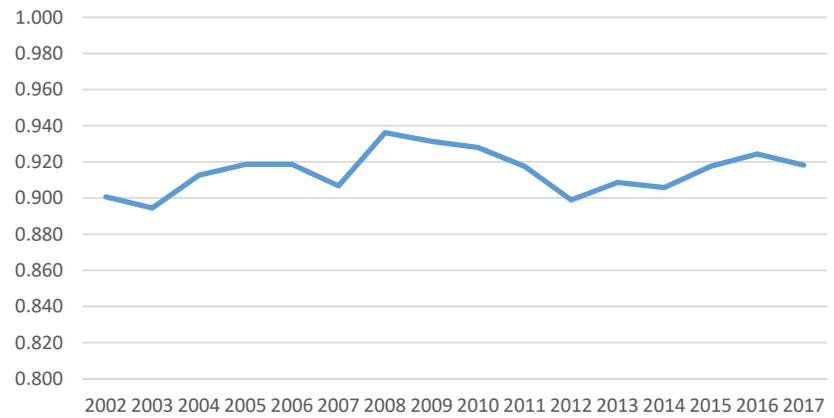


Figure 6c. US home bias in financial bonds

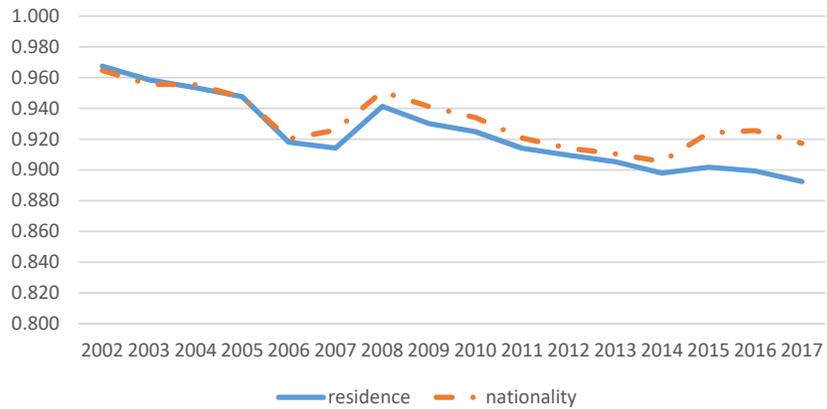


Figure 6d. US home bias in nonfinancial bonds

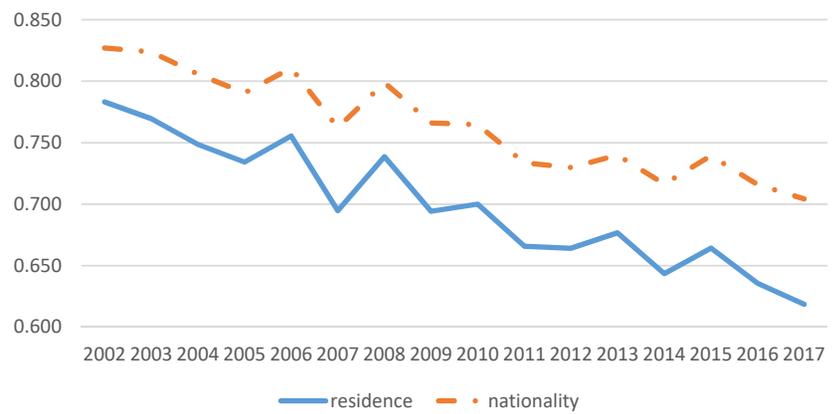
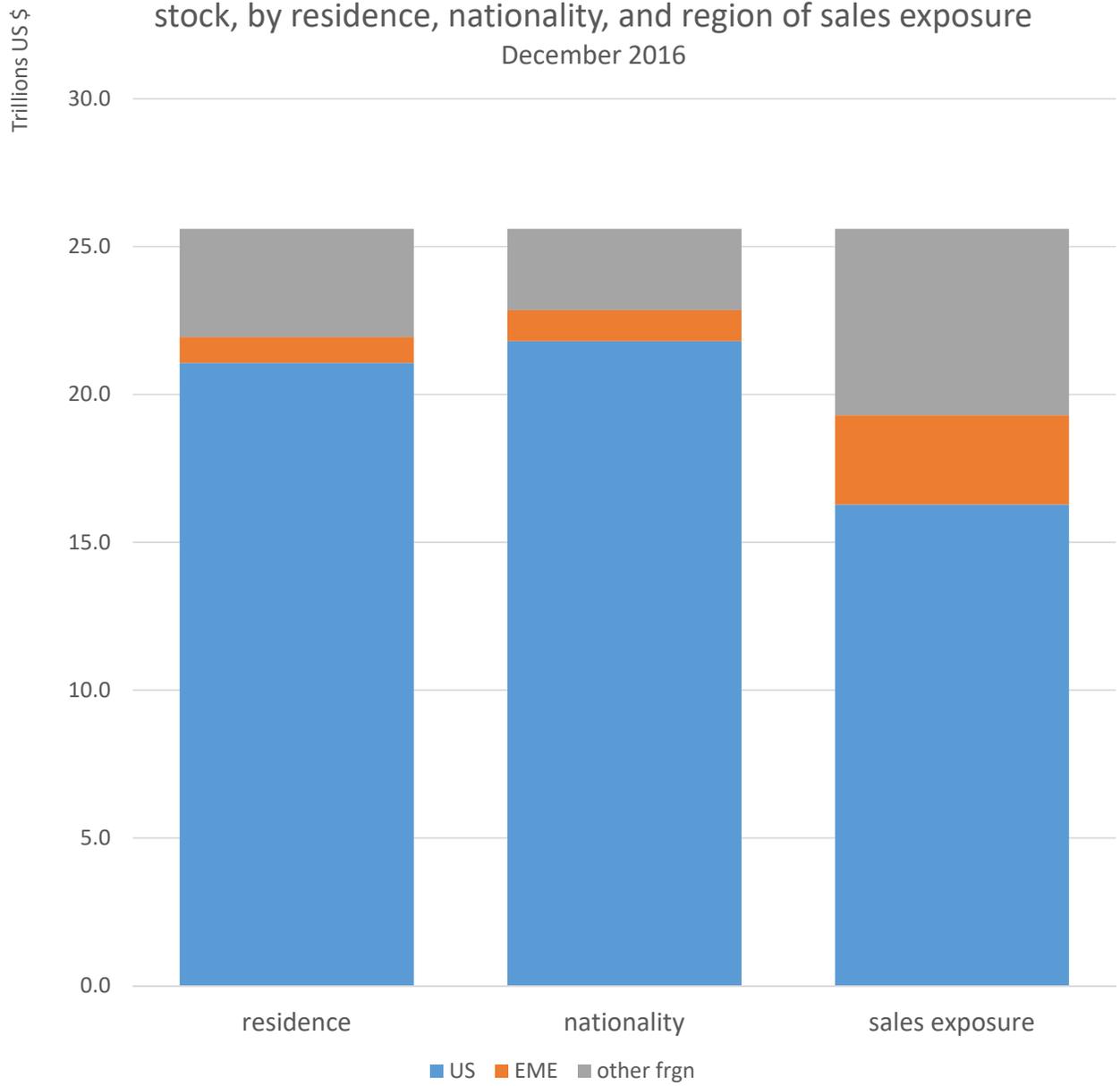


Figure 7. Estimated US investor total portfolio of common stock, by residence, nationality, and region of sales exposure
December 2016



Source: Authors' calculations from Worldscope and Treasury International Capital, Surveys on U.S. Portfolio Holdings of Foreign Securities (December 2016)

Table 1. U.S. Portfolio Holdings of Foreign Securities As Reported and Amounts with Different Country of Nationality
Billions of Dollars

	2016		2005	
	As reported	With different country of nationality	As reported	With different country of nationality
Long Term Debt	2,437	631	1,028	184
Common Stock	5,918	1,333	3,224	612
Funds and other equity	1,229	991	94	38
Total	9,583	2,955	4,346	834

Authors' calculations from Treasury International Capital, Surveys of U.S. Portfolio Holdings of Foreign Securities

Table 2. Global cross-border equity and bond holdings as reported in the IMF Coordinated Portfolio Investment Survey, December 2016, Billions of US Dollars

	Total	LT Debt	Equity
Total cross-border portfolio investment holdings (excluding reserves holdings)	42,566	19,389	23,177
Totals reported to Caribbean & other offshore centers	4,165	1,025	3,140
Totals reported to Luxembourg, Netherlands, and Ireland (countries for incorporation of financing arms and investment funds)	5,643	1,599	4,044
Country of nationality other than as reported	9,522	2,457	7,065

Notes: other offshore centers include Guernsey, Jersey, Isle of Man, Liberia, Mauritius, and the Marshall Islands

Totals reported by all economies in the CPIS, excluding SEFER and SSIO holdings

Source: Authors' calculations from IMF Coordinated Portfolio Investment Survey, December 2016.

Table 3. Regression results for U.S. relative portfolio weights in foreign country equity

	(1) Nationality (MSCI) portfolio weight	(2) Residence (BoP) portfolio weight	(3) Nationality (MSCI) portfolio weight	(4) Residence (BoP) portfolio weight
(sd) exchange_rate	0.00450 (1.68)	0.0102 (1.22)	0.00114 (0.56)	0.00607 (0.86)
Individuals using the internet (%)	0.00247*** (7.04)	0.00310* (2.56)	0.00300*** (8.55)	0.00427** (2.85)
log_listed_companies	-0.00926 (-1.43)	-0.0627** (-2.92)	-0.0254*** (-4.17)	-0.0663** (-3.25)
log_distance	-0.0122 (-1.06)	-0.123* (-2.29)	-0.0164 (-1.36)	-0.169* (-2.57)
1=Common official or primary language	0.0932*** (6.49)	0.223*** (4.23)	0.0491*** (3.88)	0.230*** (3.85)
1=Common legal origins after transition	-0.0242 (-1.61)	0.261** (3.25)	-0.00587 (-0.40)	0.318*** (3.60)
1=Destination is a EU member	0.0557*** (3.72)	0.367** (3.11)	0.0366* (2.07)	0.445** (3.12)
tax_haven	0.204*** (7.50)	1.188*** (4.67)	0.194*** (7.09)	1.270*** (4.71)
GDP growth in previous year (annual %)	-0.00702** (-2.77)	0.0443 (1.26)	-0.00620* (-2.46)	0.0488 (1.35)
share_of_trade	1.066*** (4.93)	-0.00301 (-0.00)	0.919*** (4.05)	0.0418 (0.06)
Monthly equity returns correlation			0.0323 (0.95)	-0.352** (-2.59)
Rolling GDP correlation			0.0352 (0.86)	-0.546* (-2.16)
Constant	0.184 (1.58)	1.209** (2.78)	0.276* (2.08)	2.189** (3.11)
Observations	467	467	433	433
R ²	0.500	0.441	0.572	0.458

Robust standard errors (*t* statistics in parentheses)* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

Appendix

Portfolio Weight Regression Specification

$ \begin{aligned} &PortfolioWeight^1 \\ &= \beta_0 + \beta_1 SD(D_ExchangeRate)_{i,t} + \beta_2 InternetUse_{i,t} + \beta_3 Ln(Distance_i) \\ &+ \beta_4 Ln(NumListedCompanies_{i,t}) + \beta_5 CommonLanguage_i + \beta_6 CommonLegalOrigin_i \\ &+ \beta_7 EUMember_{i,t} + \beta_8 TaxHaven_i + \beta_9 GDPGrowth_{i,t-1} + \beta_{10} ShareofTrade_{i,t} \\ &+ \beta_{11} EquityReturnsCorrelation_{i,t} + \beta_{12} GDPCorrelation_{i,t} \end{aligned} $		
Variable	Definition	Source
SD(D_ExchangeRate)	The standard deviation of the month-on-month percent change in country i 's exchange rate in year t .	Bloomberg
InternetUse	The percentage of individuals using the internet in country i in year t	World Bank World Development Indicators
Distance	Geographic distance between New York City and the largest city in country i .	CEPII's <i>GeoDist</i> database ²
NumListedCompanies	The number of listed companies in country i in year t .	World Bank Financial Structure Database
CommonLanguage	Dummy variable indicating whether country i shares an official or primary language with the US.	Source: CEPII's <i>Language</i> database ³
CommonLegalOrigin	Dummy variable indicating whether country i has shared legal origins with the US.	CEPII's <i>Gravity</i> database ⁴
EUMember	Dummy variable indicating whether country i was an EU member during year t . ⁵	CEPII's <i>Gravity</i> database
GDPGrowth	Country i 's year-on-year GDP growth in year $t-1$.	World Bank World Development Indicators
TaxHaven	Dummy variable indicating whether a country is a tax haven.	Author designation ⁶
ShareofTrade	The share of United States trade in year t that occurs with country i .	U.S. Census Bureau's Foreign Trade statistics
EquityReturnsCorrelation	8-year rolling correlation between monthly equity returns in country i and in the US	Bloomberg
GDPCorrelation	20-year rolling correlation between annual GDP in country i and in the US.	CEPII's <i>Gravity</i> database

¹ Countries that appear in our sample: United Arab Emirates, Argentina, Australia, Austria, Belgium, Brazil, Canada, Switzerland, Chile, China, Colombia, Cyprus, Czech Republic, Germany, Denmark, Egypt, Spain, Finland, France, United Kingdom, Greece, Hong Kong, Hungary, Indonesia, India, Ireland, Israel, Italy, Jordan, Japan, South Korea, Luxembourg, Morocco, Mexico, Malaysia, Nigeria, Netherlands, Norway, New Zealand, Peru, Philippines, Poland, Portugal, Qatar, Russia, Saudi Arabia, Singapore, Sweden, Thailand, Turkey, South Africa

² See Mayer and Zignago (2011).

³ See Melitz and Toubal (2014).

⁴ See Head et al (2010) and Head and Mayer (2014).

⁵ Only Croatia and Bulgaria change EU designation in the sample period.

⁶ The countries that we designate as tax havens are Aruba, Bahamas, Bermuda, British Virgin Islands, Cayman Islands, Curacao, Guernsey, Isle of Man, Jersey, Netherlands Antilles, Nauru, Marshall Islands, Ireland, Netherlands, Luxembourg, and Switzerland. Only Ireland, Netherlands, Luxembourg and Switzerland are ultimately in the regression sample.



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Central Bank Statistics

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Ninth IFC Conference on "Are post-crisis statistical initiatives completed?"

Basel, 30-31 August 2018

Globalization and the geography of capital flows¹

Carol Bertaut, Beau Bressler, and Stephanie Curcuru,
Board of Governors of the Federal Reserve System

¹ This presentation was prepared for the meeting. The views expressed are those of the authors and do not necessarily reflect the views of the BIS, the IFC or the central banks and other institutions represented at the meeting.

Globalization and the Geography of Capital Flows

Carol Bertaut, Beau Bressler, and Stephanie Curcuru

Division of International Finance
Board of Governors of the Federal Reserve System

This presentation is prepared for the
9th biennial IFC Conference
“Are post-crisis statistical initiatives completed?”
Basel, Switzerland, August 30-31 2018

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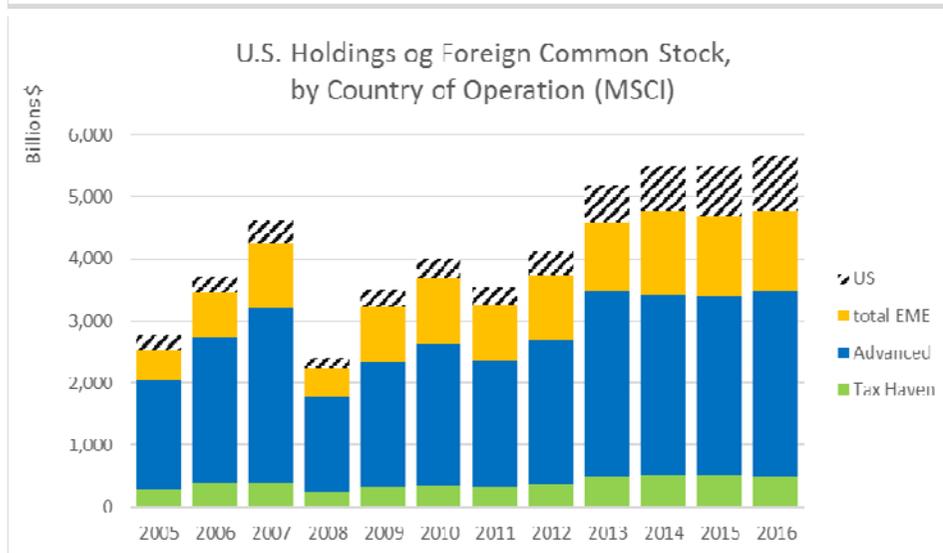
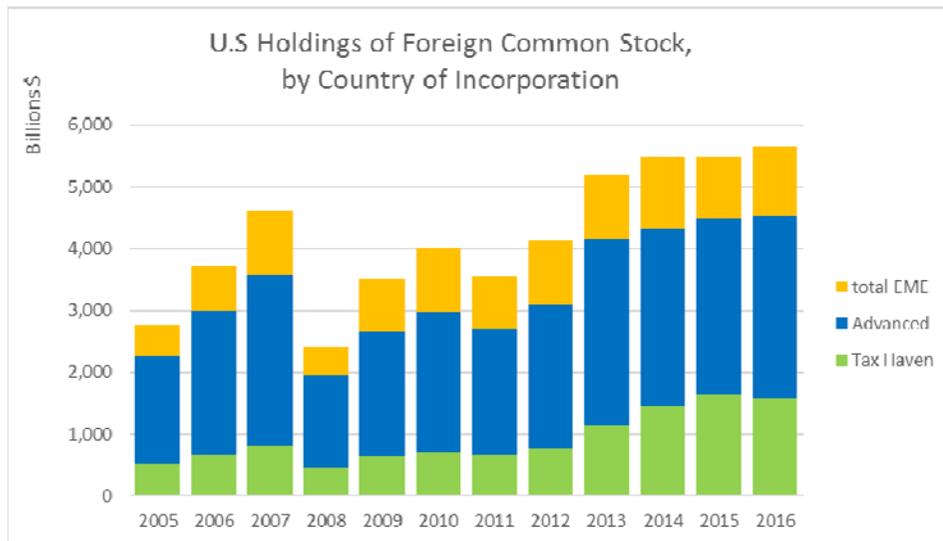
Official statistics on capital flows, portfolio holdings provide an increasingly distorted view of actual investor exposures and cross-border linkages

- Post-crisis initiatives for CPIS: greater participation, more granularity (issuer/holder sectors), more frequent (semi-annual)
- These data are still based on BOP framework of **legal residence**
- Country assignment may not convey useful information about investor exposures, because firms may not do any business in that residence.
 - Multinationals incorporate in tax havens, especially when intangibles important
 - Firms issue debt out of financing arms in offshore centers for improved market access
 - Mutual funds established in tax havens
- Increasing recognition of problem:
 - Lane & Milesi-Ferretti (2017): increasing distortionary effects of financial center intermediation for assessing external exposures
 - BIS banking statistics: post-crisis locational-by-nationality initiatives
 - BIS international debt securities on both **residence** & **nationality** basis

Our Study

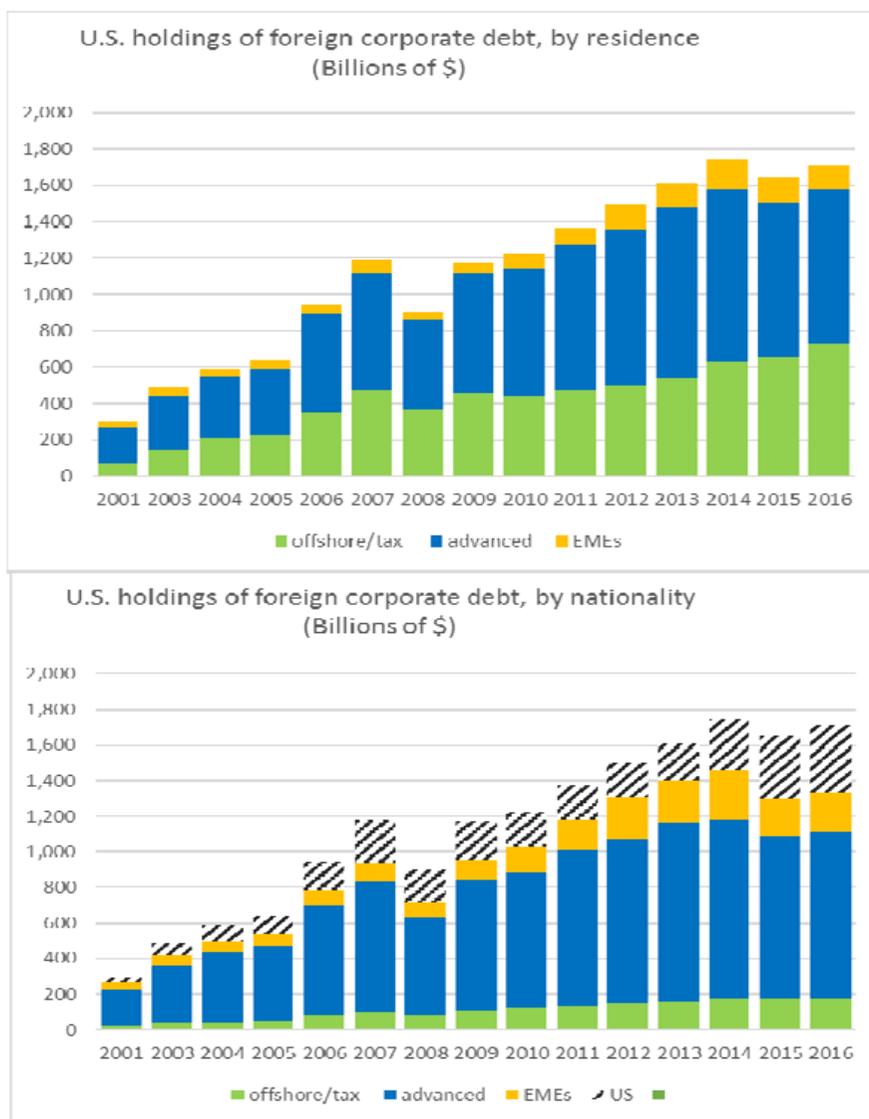
- We combine underlying security-level data on U.S. foreign portfolio investment with a variety of commercial data sources designed for investors to monitor portfolios relative to benchmarks
 - Allows us to map U.S. investor holdings from **residence** basis to **nationality** basis (based on location of parent, or firm's center of operations)
 - Ongoing work: map holdings to fuller **exposure** basis based on where firms actually do business from firm level data on location of sales
- We find that distortions in the U.S. portfolio data just from **residence** to **nationality** are large, and growing
 - ~\$3 trillion, nearly 1/3 of U.S. cross-border portfolio in 2016
- Global portfolios becoming similarly distorted
- Distortions have important consequences for researchers and policy makers:
 - drivers of portfolio allocations and capital flows
 - spillovers of monetary policy
 - resilience of different types of capital flows
 - effectiveness of capital controls
 - components of and sustainability of current account

U.S. investor holdings of foreign common stock: residence versus nationality basis



- **Residence** basis: \$5.6 trillion in 2016
 - \$1.6 trillion is in tax havens
- Use MSCI constituents to map to **nationality**
- \$900 billion is considered U.S. by MSCI
 - U.S. multinationals incorporated in tax havens abroad
 - Recent increases: U.S. M&A/ corporate inversions in Ireland
- Within foreign: more EME holdings by nationality, especially Chinese firms incorporated in Caymans
- Only common stock holdings. Fund shares add additional layers of distortion: in terms of type of assets, in addition to country
 - Holdings disproportionately in the Cayman Islands, British Virgin Islands, Luxembourg
 - Adds another \$1 trillion in distortion

U.S. investor holdings of foreign corporate bonds: Residence versus nationality



- Focus on corporate bonds because government bonds not typically affected by offshore financing arms
- **Residence** basis: foreign corporate debt: \$1.7 trillion by 2016
- 40% is from offshore centers and tax havens
- **Nationality** basis: total holdings of foreign corporate bonds smaller at \$1.3 trillion
- EME holdings larger because of EME firms that issue out of offshore centers
 - Especially true for Chinese, Brazilian, Russian firms

Global Distortions: \$9.5 trillion in 2016 (nearly a quarter of total cross-border holdings)

Global cross-border equity and bond holdings in IMF CPIS

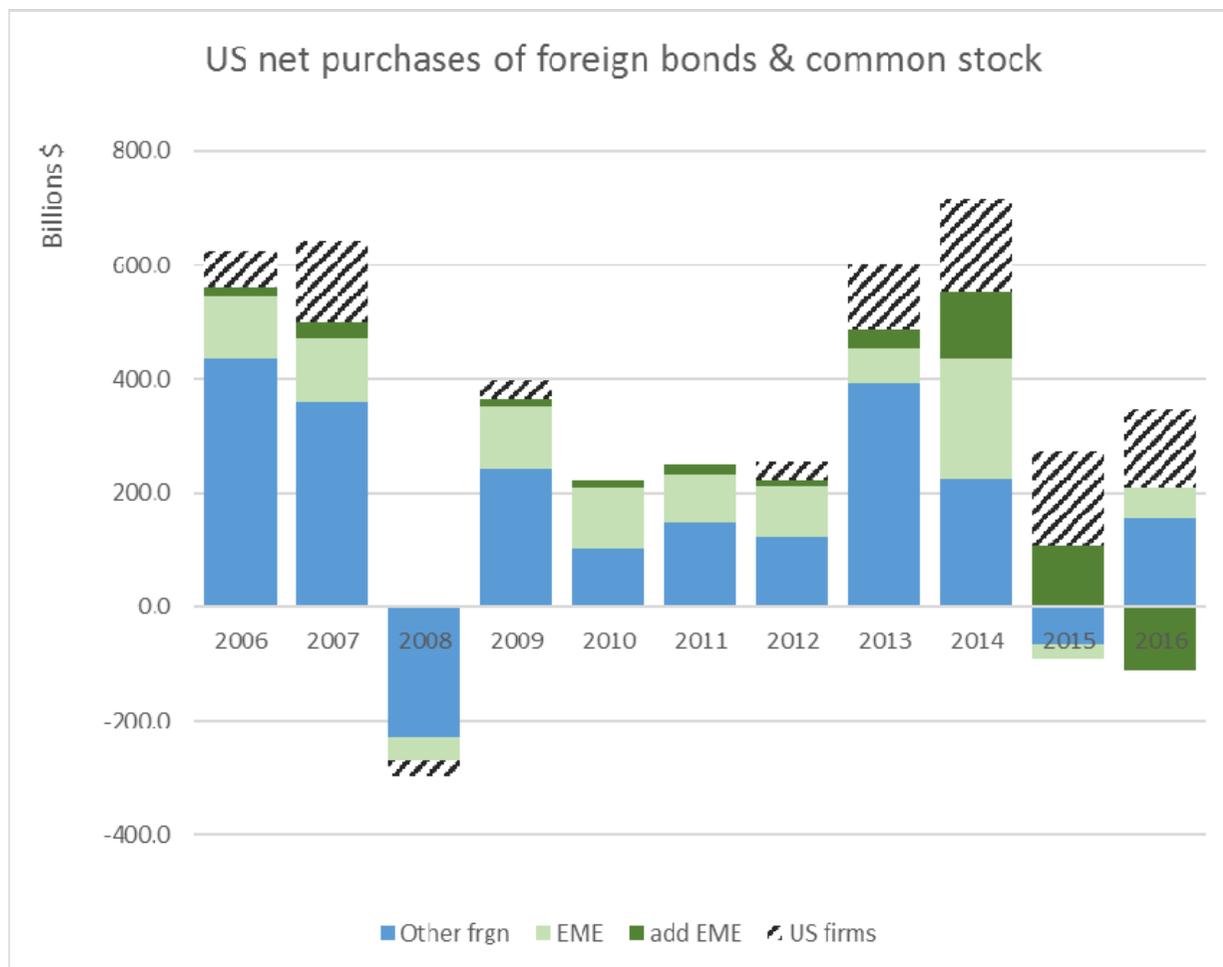
December 2016, Trillions of US Dollars

	Total	LT Debt	Equity
Total cross-border portfolio investment holdings (excluding reserves holdings)	42.6	19.4	23.2
Caribbean & other offshore centers	4.2	1.0	3.1
Luxembourg, Netherlands, and Ireland	5.6	1.6	4.0
Estimated holdings with a different country when reported as nationality instead of residence	9.5	2.5	7.1

Notes: other offshore centers include Guernsey, Jersey, Isle of Man, Liberia, Mauritius, and the Marshall Islands

Totals reported by all economies in the CPIS, excluding SEFER and SSIO holdings

Restated flows: U.S. net purchases of foreign stocks and bonds on residence versus nationality basis

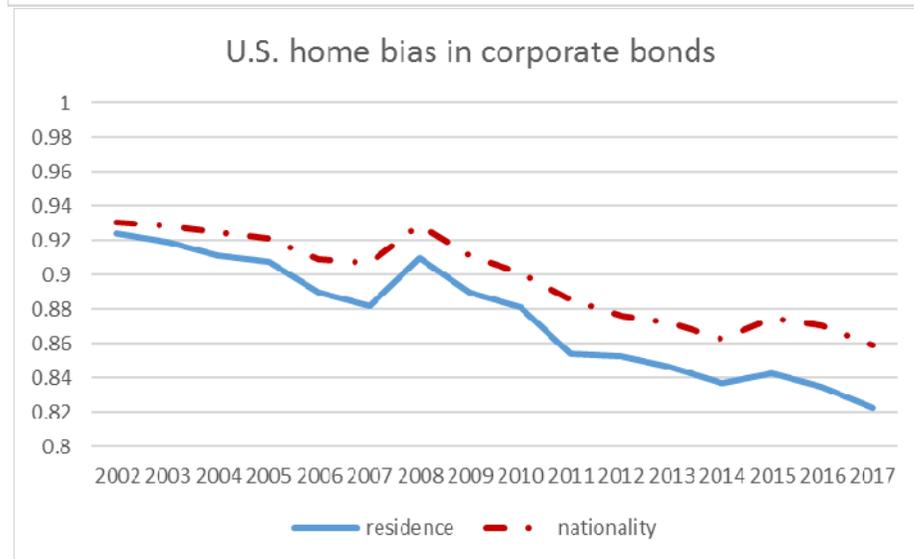
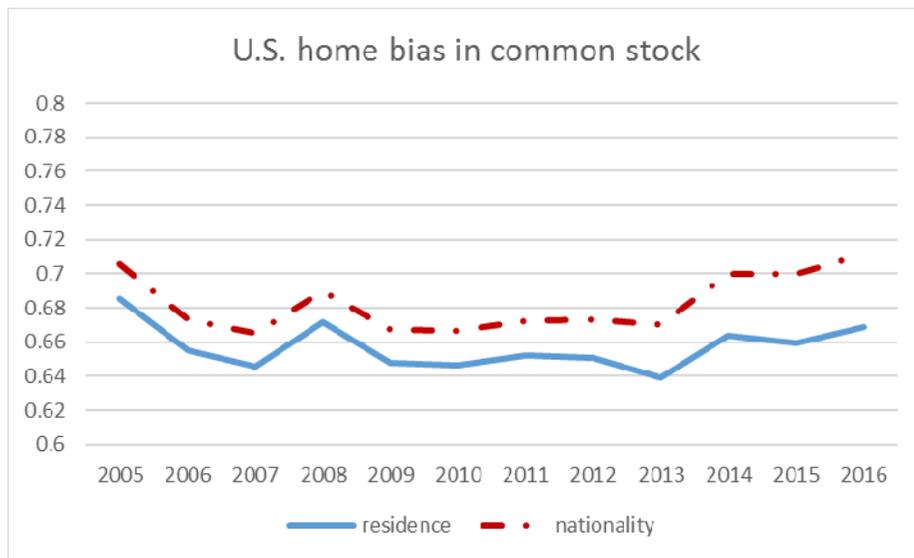


- U.S. purchases foreign assets on **nationality** basis are not as large as reported in lead-up to crisis, and not as large in last few years
- Differences within purchases of foreign securities: more EME purchases initially post-crisis, larger sales of EME assets last year

Implications of differences in flows (especially to EMEs)

- Spillovers of accommodative policy in advanced economies and implications for its removal:
 - Post-crisis, U.S. portfolio flows to EMEs have been larger than reported, but sales also larger in last couple years
- Purchases of bonds issued via offshore centers will result in FDI, not portfolio, inflows
 - FDI flows often considered more stable than portfolio flows, but offshore issuance means FDI increasingly “portfolio – like”
- Could misrepresent effectiveness of capital controls if focus on portfolio flows but purchases switch to offshore bonds
- More generally: Potentially gets us closer to answering Lucas paradox why doesn't capital flow from AEs to EMEs, if EME flows understated
- Has contributed to current configuration of U.S. current account
 - Large direct investment receipts from affiliates in tax havens, but larger trade deficit because exports do not embody value of intellectual property/intangibles
 - Implications for how we think about CA sustainability

Implications for global portfolio allocations & “Home Bias”



- ICAPM: in frictionless world, global investors should hold market cap in portfolio:

$$\frac{\frac{\text{holdings of foreign equity}}{\text{total equity portfolio}}}{\frac{\text{foreign equity market cap}}{\text{world equity market cap}}}$$

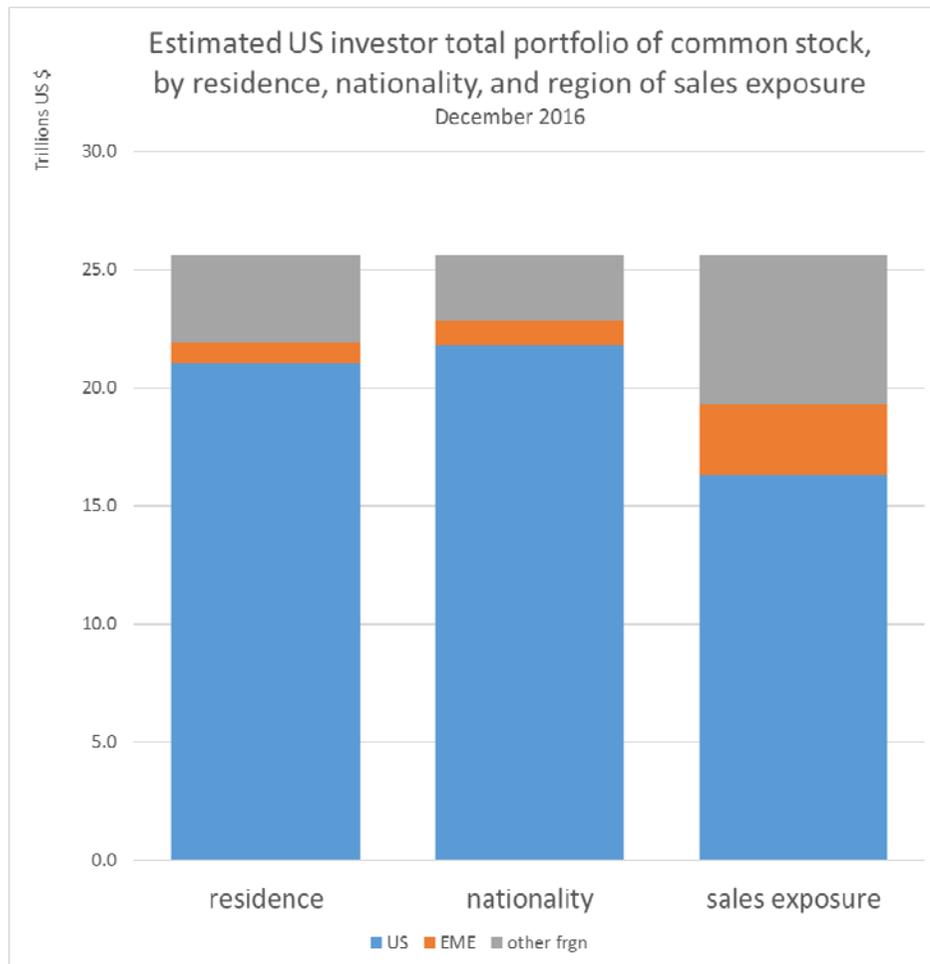
- But investors don't: widespread “home bias”
- Literature: frictions, hedging costs, market access, information advantages of home country firms
- We find U.S. measures of home bias are higher, and have come down by less in recent years, when measured by nationality
- Has implications for what drives home bias and investor allocations

Cross-country relative portfolio weights: Similar to home bias concept; shares of country i equity in portfolio and in market cap

	Nationality (MSCI) portfolio weight	Residence (BoP) portfolio weight
(sd) exchange_rate	0.00114	0.00607
Individuals using the internet (%)	0.00300***	0.00427**
log_listed_companies	-0.0254***	-0.0663**
log_distance	-0.0164	-0.169*
1=Common official or primary language	0.0491***	0.230***
1=Common legal origins after transition	-0.00587	0.318***
1=Destination is a EU member	0.0366*	0.445**
tax_haven	0.194***	1.270***
GDP growth in previous year (annual %)	-0.00620*	0.0488
share_of_trade	0.919***	0.0418
Monthly equity returns correlation	0.0323	-0.352**
Rolling GDP correlation	0.0352	-0.546*
Constant	0.276*	2.189**
Observations	433	433
R ²	0.572	0.458
t statistics in parentheses		
* p < 0.05, ** p < 0.01, *** p < 0.001		

- Estimate gravity model to explore differences in US investor allocations across countries
- Panel data, ~40 countries ~12 years
- LHS variable is relative weight in each country
- Create relative country weights 2 ways:
 - residence
 - nationality
- Would draw different conclusions about factors that influence portfolio decisions: ie importance of trade vs diversification variables
- Would conclude that distance, common language, legal origin matter more if used residence specification
 - These results may say more about what matters for where firm locates than what influences investor choices

But even nationality basis still doesn't address “exposures” more broadly, in terms of where multinationals actually do business



- Consider full common stock portfolio of US investors: holdings of domestic equity as well as foreign equity
- Map firm-level holdings to firm-level Worldscope data on location of revenues to determine international exposures
 - Large U.S. multinationals have considerable sales in foreign locations: U.S. investors have foreign exposure through these holdings
 - Partially offset by increased U.S. exposure from foreign multinationals that do business in the United States
- Implications for how we think about home bias