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New Data and New Methods**

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Estimating U.S. Cross-Border Securities Positions: New Data and New Methods

Carol Bertaut and Ruth Judson*

Abstract:

The role of capital flows in the buildup to the global financial crisis and the potential vulnerabilities posed by capital flows to emerging market economies highlight the importance of reliable and timely measures of cross-border investment activity to better monitor developments as they unfold. We present new monthly estimates of U.S. cross-border securities investment, combining information from detailed annual Treasury International Capital (TIC) surveys with new information from the TIC form SLT. We also show how changes in the new monthly data can be decomposed into flows, estimated valuation changes, and a residual “gap”. These decompositions can provide a richer and timelier view of developments in both foreign portfolio investment in the U.S. and U.S. portfolio investment abroad than available from transactions data or survey data alone. Data on cross-border holdings through December 2013, by country, are available for download; we also provide advice on how to construct estimates going forward. These data can be combined with the existing Bertaut-Tryon monthly estimates of securities holdings (now updated through 2011) to generate consistent monthly time series of positions.

Keywords: Capital Flows; Portfolio Investment; Treasury International Capital, U.S. Treasuries, Emerging Market Economies

JEL Classifications: C8, F3, G1

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1. Introduction

Considerable attention has been paid to how global imbalances and the rapid growth in international capital flows contributed to build-up in financial vulnerabilities that lead to the global financial crisis.¹ More recently, policy makers and researchers have focused attention on the potential vulnerabilities posed by large capital inflows to emerging market economies.² These developments highlight the need for comprehensive, accurate, and timely data on cross-border flows and positions. Until recently, such comprehensive data for the United States – in particular, data by county of investor or destination – were available only annually, and only with a considerable lag. We show how to combine new aggregate (monthly) data collected through the Treasury International Capital (TIC) system on U.S. cross-border securities holdings with existing data sources to generate consistent time series of holdings by security type and by country of foreign holder (for U.S. securities) and country of issuer (for U.S. investment in foreign securities).

Section II below provides some background on the growth and composition of the U.S. cross-border portfolio. We review the components of the TIC system that provide the underlying data for these estimates – and the various caveats attached to these data – in Section III. Sections IV and V provide more detail on the new TIC form SLT and how we use this new data source in constructing our updated estimates. We also show how changes in the new monthly data can be decomposed into flows, valuation changes, and a residual “gap”. We discuss how these

¹ For a very partial literature, see for example Obstfeld and Rogoff (2009), Caballero (2010), Bernanke et al. (2011), Borio and Disyatat (2011), Shin (2011), and Bertaut et al. (2012).

² See for example IMF (2011), Powell (2013), and Ahmed and Zlate (2013).

decompositions provide a richer view of both foreign investment in the U.S. and U.S. investment abroad, while raising some new questions, in Section VI. The new data show, for example, that U.S. investment in emerging market bonds was considerably stronger in 2012 and held up better during the emerging markets financial turbulence in 2013 than implied by transactions data. On the other hand, the data raise a puzzle with respect to transactions and holdings of U.S. Treasury securities in some offshore financial centers: over the past two years, transactions data have indicated very large net sales of U.S. Treasuries by entities in the Cayman Islands, while holdings of Treasuries in the Cayman Islands actually increased slightly over this period. We interpret this inconsistency as potentially pointing to “short sales” of Treasuries by entities in the Cayman Islands. With our new methodology, we extend the existing Bertaut-Tyron (2007) monthly estimates of country level securities holdings and the estimated monthly decomposition of these holdings through December 2013, and we provide guidance on how these estimates can be extended beyond this date.

2. The significance of cross-border securities positions

2.1. Current account financing

Cross-border financial flows and portfolio holdings provide considerable information about the financing of external imbalances, changes in a country’s foreign indebtedness, and foreign investor attitudes toward domestic assets. Cross-border financial flows are the counterparts to transactions recorded in the current account, the broadest measure of a country’s transactions with the rest of the world. When a country runs a deficit in the current account, it must finance this imbalance by on net selling assets to, or borrowing from, foreign investors. These net inflows are recorded in the financial account. For the United States, a sustained trade imbalance has resulted in a deficit in the current account since the early 1990s. This excess of

imports over exports has been funded primarily by foreign acquisitions of U.S. securities, from official foreign investors (mostly in the form of purchases of U.S. Treasury securities) as well as from foreign private investors (mostly in the form of purchases of U.S. corporate securities); these balances are shown in Figure 1. Foreigners' willingness to continue investing in U.S. assets is thus an important determinant to U.S. asset prices and the exchange rate of the dollar. At the same time, U.S. cross-border investment flows into foreign-issued securities have also been growing, with the result that gross cross-border securities flows and positions have become ever larger. Having accurate, current information on how cross-border investment patterns are evolving is thus highly relevant for policy makers and market analysts.

2.2. Appetite for cross-border investment

For instance, accurately assessing the magnitude of foreign official purchases of U.S. Treasury and U.S. government agency securities is necessary for understanding how significant these purchases may have been in holding down yields on these securities in the years leading up to the recent global financial crisis (see for example Warnock and Warnock (2009) and Beltran et al. (2013)). As can be seen in Figure 2, foreign purchases of U.S. Treasuries have accounted for significant portions of net Treasury issuance nearly every year since 1996.

At a more detailed level, accurately assessing the country of acquisition of different types of securities is necessary for understanding the global pattern of exposures and risk taking that accompanied the years leading up to the crisis. Bernanke et al. (2011) and Bertaut et al. (2012) show how European investors were major buyers of U.S. corporate financial debt – including mortgage-backed and other structured investment products – in the years leading up to the crisis. More recently, attention has been drawn to the pick-up in capital inflows from advanced economies into emerging market economies and the potential for abrupt reversals of these flows.

According to data from the 2012 Coordinated Portfolio Investment Survey, U.S. investors account for more than a third of all cross-border investment in bonds and equity of emerging market economies. Thus, accurately identifying the extent of U.S. portfolio acquisitions of foreign securities and the country composition of portfolio flows and positions are clearly important for analyzing how vulnerable countries may be to changes in investor sentiment.

2.3. Insights into portfolio allocation

Accurate data on cross-border securities holdings and portfolio shares invested in different countries are also necessary for correctly assessing U.S. investor behavior. Curcuro et al. (2011) show, for example, that contrary to earlier stylized facts, U.S. investors do not exhibit returns-chasing strategies in their cross-border investment but instead appear to sell past winners, consistent with partial portfolio rebalancing.

3. Estimating cross-border positions and flows prior to 2012

3.1. The TIC reporting system

Cross-border financial flows occur mainly in the form of purchases and sales of securities, lending to banks and firms, and direct investment. The first two types of activity are monitored through the TIC reporting system; the third, direct investment, which we will not review here, is collected and administered by the Bureau of Economic Analysis (BEA).³ The TIC reporting system comprises several monthly forms as well as annual surveys and more-extensive periodic benchmark surveys of securities holdings.

³ The BEA compiles the official—and most comprehensive—measures of U.S. cross-border financial flows and positions in the quarterly balance of payments accounts and net international investment position. The BEA's data on international accounts, including the balance of payments accounts and the international investment position, are published in both the BEA's Survey of Current Business (www.bea.gov/scb/index.htm) and on its International Economic Accounts webpage (www.bea.gov/bea/di1.htm).

Under the current Treasury International Capital (TIC) reporting system, a variety of monthly and quarterly reports are filed with district Federal Reserve Banks by commercial banks, securities dealers, other financial institutions, and nonbanking enterprises in the United States.⁴ These data are centrally processed and maintained at the Federal Reserve Bank of New York, which, along with the district banks, acts as fiscal agent for the U.S. Treasury. Since late 1998, the Federal Reserve Board also has supported the TIC data collection system by providing final review and dissemination of TIC data to the Treasury as well as to other agencies, including the Bureau of Economic Analysis and the Bank for International Settlements.⁵ The TIC reports of individual respondents are treated as confidential and access to the respondent-level data is strictly limited by law.

Data derived from Treasury reports are posted monthly on the TIC website at <http://www.treasury.gov/resource-center/data-chart-center/tic/Pages/index.aspx>. TIC data aggregates are also published monthly at the Federal Reserve's website, www.federalreserve.gov/econresdata/releases/secholdtrans/current.htm, and are used in the U.S. international transactions and investment position compilations published by the Department of Commerce in the *Survey of Current Business*.

3.2. Measuring cross-border securities positions: Annual TIC surveys

Annual surveys of cross-border security holdings provide the most accurate and detailed information on cross-border securities holdings by the United States and the rest of the world.⁶

⁴ For an overview of the monthly and quarterly TIC forms, see Appendix 1.

⁵ The Federal Reserve Board provides data collected by the TIC system to the BIS for its locational data statistics.

⁶ For additional background information on the surveys, see Grier, Lee, and Warnock (2001); Bertaut, Grier, and Tryon (2006); and the annual survey reports released by the Treasury Department available at www.treasury.gov/resource-center/data-chart-center/tic/Pages/fpis.aspx.

The TIC system currently includes two sets of comprehensive annual position surveys for long- and short-term securities. The *liabilities* survey, or SHL, measures foreign holdings of U.S. securities, or U.S. securities liabilities to foreigners, at the end of June each year. Data are collected at the individual security level by country of holder and by type of holder (official or private). The *claims* survey, or SHC, measures U.S. holdings of foreign securities, or U.S. assets held in form of securities issued by foreigners, at the end of December each year. Data are collected at the individual security level and by broad type of holder.

Liabilities and claims survey data are collected from large benchmark surveys and smaller surveys in the intervening four years. The data are collected from large U.S. custodian banks and U.S. broker-dealers as well as from issuers of U.S. securities issued directly in foreign markets and from large U.S.-resident end investors who do not use U.S. custodians for holdings of foreign securities (for example, some pension funds, foundations, and endowments). For both claims and liabilities, benchmark surveys are currently conducted every five years; in these years, the reporting panel includes all reporters who reach the reporting threshold.⁷ In years between benchmarks, the panel is generally stable and comprises primarily the largest reporters from the benchmark surveys.⁸ For all surveys, staff members at the Federal Reserve Bank of New York and at the Federal Reserve Board conduct extensive reviews of the data, including reporters' valuations of each security and reporters' designation of each security's characteristics, most importantly the security issuer's country of incorporation. In addition to

⁷ For the most recent benchmark survey, the 2011 SHC, the reporting threshold was \$100 million. The most recent liabilities benchmark survey was conducted in 2009.

⁸ The most recent benchmark claims survey was conducted in December 2011 and the most recent benchmark liabilities survey was conducted in June 2009. For annual surveys, all U.S.-resident entities that have been contacted by the Federal Reserve Bank of New York must report, regardless of the size of their consolidated holdings. For the most recent benchmark survey, the 2011 SHC, the reporting threshold was \$100 million.

any corrections, the raw aggregated data are also adjusted for securities that are reported by both issuers and custodians, and to make reporting samples comparable across annual and benchmark years.⁹

Despite the richness of the TIC survey data at the security level, major shortcomings of the survey data are that these data are only available annually, are collected at different times for liabilities and claims, and are only usable with a substantial lag: Detailed data from each survey are typically released about ten months after the survey date.¹⁰ For example, the data from the June 2012 liabilities survey were released in late April 2012, and the data from the December 2012 claims survey were released in late October.

3.3. Measuring cross-border transactions: The TIC S data

In addition to the survey data, which measure positions in securities at a certain point in time in a year, the TIC system has also long collected financial flow data on the S form. The TIC S form collects monthly transactions data on cross-border purchases and sales of long-term U.S. Treasury and agency securities, U.S. corporate bonds and other bonds, U.S. equities, and foreign stocks and bonds. These data are collected from U.S.-resident broker-dealers responsible for securities transactions with nonresidents as well as from some issuers, end investors, and money managers.¹¹ Unlike the survey data, TIC S data are collected only in aggregate by security type but become available with a much shorter lag—about 45 days. Thus, TIC S data provide us with a timely and useful tool to gauge cross-border investment at a

⁹ See chapter 2 of the annual survey reports for more details on the survey methodology. Annual survey reports are available at www.treasury.gov/resource-center/data-chart-center/tic/Pages/fpis.aspx.

¹⁰ Preliminary aggregate data are typically released about eight months after the survey date.

¹¹ Reporting is legally required for these entities if their monthly cross-border transactions are above the \$50 million threshold during the reporting month.

monthly frequency. For example, are U.S. investors investing abroad? Are these investments in equities or debt? Are foreign investors buying U.S. securities? Are they mainly official or private investors? The TIC S data can help to answer these questions between surveys, but it is important to note two aspects of the TIC S data that can cause misleading interpretations of cross-border flows.

First, by design, the TIC S data are recorded according to country of the first cross-border counterparty, not the country of the ultimate buyer or actual seller or issuer of the security. By recording direct transactions with foreign residents, who are often broker–dealer counterparties, the TIC S data record financial transactions between the two countries, information that is important for the U.S. balance of payments statistics. As a result, the geographical distribution of transactions and the breakdown of transactions between official and private is heavily weighted toward activity through financial centers and toward private flows. Cumulating flows to estimate positions can thus result in “transactions bias” in estimates of the geographical distribution of securities holdings as well as in the distribution of investment across official and private investors.¹²

For example, when a German resident buys a U.S. Treasury bond through a London broker, the TIC S will record a sale to the United Kingdom rather than Germany. As a result, the reported monthly transactions data are concentrated in major international financial centers. Similarly, measured transactions often do not fully account for transactions made on behalf of official foreign investors. For example, if the Chinese government buys U.S. agency bonds through an intermediary in Hong Kong, the TIC S (correctly) will report a purchase of U.S.

¹² See Griever, Lee, and Warnock (2001) and Warnock and Cleaver (2002).

agency bonds by a private Hong Kong counterparty. The TIC S does not capture the foreign-to-foreign transaction between the Hong Kong broker and the Chinese government. These distinctions can be important when trying to assess, for example, the relative strength of official and private demand for U.S. assets.

Second, the TIC S data do not record certain types of cross-border securities flows that do not pass through standard broker–dealer and other TIC S reporter channels. In particular, the TIC S cannot account for principal repayment flows of asset-backed securities. As a result, position calculations derived from S-reported flows result in overestimates of foreign net acquisitions of these securities. Similarly, the TIC S does not collect data on cross-border acquisitions of stocks through merger-related stock swaps or re-incorporations because these transactions are considered direct investment transactions, for which data are collected by the BEA.¹³ To assist users in obtaining more-comprehensive net transactions data, Federal Reserve Bank of New York and Federal Reserve Board staff construct estimates of asset-backed securities (ABS) repayment flows and stock swaps which are published on the TIC website.¹⁴

Position data collected by the surveys and, more recently, the SLT, record the country of the holder and so do not suffer from this “transactions bias,” but position data, like flow data, are subject to another complication, known as “custodial bias”. This bias arises for U.S. liabilities when a foreign holder chooses to use a custodian in a different country. For example, if a Russian investor chooses to hold the securities with a custodian in the United Kingdom, the

¹³ For example, when a U.S. firm buys a foreign firm and the transaction is financed through a stock swap, or when a foreign firm relocates to the United States, U.S. residents’ holdings of the foreign firm’s stock are no longer considered foreign securities, but the change in ownership is not reported on the TIC S. For more details, see Bertaut and Tryon (2007).

¹⁴ See www.treasury.gov/resource-center/data-chart-center/tic/Pages/ticsec2.aspx, sections 4a and 4b.

liability would be recorded against the United Kingdom rather than Russia. As a result, the total liability position worldwide is correct, but the geographic allocation is not. This same custodial bias can also result in an underestimate of foreign official holdings of U.S. securities if the official investor holds U.S. securities with a foreign custodian. For example, if an official investor uses a custodian in Switzerland to hold U.S. Treasuries, these holdings will be reported by the U.S.-resident sub-custodian, who typically only has information on the location and identity of the Swiss bank that is holding the securities, and thus will report them as held by a private entity (the custodian) in Switzerland. As we discuss below, the SLT liabilities data displays the same custodial bias as do the annual surveys of foreign holdings of U.S. securities.

Custodial bias is significantly reduced for the annual surveys of U.S. claims on foreigners because the security level detail in the claims survey allows for accurate identification of the issuing country for each security. And as will be seen, the SLT claims data and the claims survey country allocations generally track one another closely; as a result, we believe that despite collecting holdings only in aggregate, country attributions for claims are likewise not distorted by custodial bias on the SLT.

In addition to custodial bias, which affects the recorded geographic distribution but not the total, three types of institutional arrangements likely lead to misreporting of overall cross-border securities positions. First, U.S. securities claims on foreigners are likely underreported when U.S. end-investors entrust their securities holdings to foreign investment managers or custodians without involving a U.S. investment manager or custodian. Typically, a U.S. investor who keeps foreign securities abroad will use a domestic investment manager; this domestic manager will report the investor's holdings on the annual claims survey on behalf of the U.S. investor. However, if the U.S. investor uses a foreign investment manager, these holdings and associated

securities transactions may be missed because the TIC reporting system only has authority to collect data from U.S.-resident entities and cannot collect information from individual U.S. persons.¹⁵ As a result, U.S. holdings of foreign securities may be somewhat underreported in the TIC system. Second, and possibly contributing to overreporting of U.S. liabilities to foreigners, if a U.S. resident holds U.S. securities with a custodian abroad, these holdings might be counted as foreign holdings of U.S. securities if the U.S. custodian with subcustodian responsibilities does not know that the primary [foreign] custodian is holding the securities on behalf of a U.S. investor and may instead assume that the foreign custodian is holding the securities on behalf of foreign investors. Finally, it is possible that U.S. investors entrust U.S. securities issued in foreign markets to foreign custodians; as in the previous case, U.S. liabilities could be overreported if these custodians assume that the investors are foreigners rather than U.S. residents.¹⁶

3.4. Estimating monthly positions from survey and TIC S data: The Survey-S estimates

Notwithstanding the shortcomings of the flow data described above, in order to obtain timelier information on cross-border securities positions between surveys, we can estimate monthly time series of positions to date by combining the annual survey data with the TIC S

¹⁵ The potential for claims surveys to undercount actual ownership of foreign securities is discussed by the IMF in the Coordinated Portfolio Investment Survey Guide, Second Edition, available at http://www.imf.org/external/pubs/ft/cpis/2002/pdf/cpis_index.pdf

¹⁶ As noted below, the liabilities survey data are adjusted for “overreporting” by comparing the total quantity of a particular foreign-issued U.S. security outstanding with the sum of the amount reported by custodians as held by foreigners and the amount reported by the U.S. issuer. This sum should be less than or equal to the total outstanding. However, in some cases the same securities are reported by the U.S. issuer and also by the custodian, resulting in a sum that exceeds the total outstanding. At the individual security level, such overreporting can be identified and corrected. However, this overreporting correction cannot separately identify the problem described here.

data.¹⁷ The monthly estimated positions between surveys are constructed in three steps for each asset type in the liabilities and claims surveys, as indicated by equation (1).

$$x_t = x_{t-1}(1 + V_t) + S_t + A_t \quad (1)$$

First, beginning with data from the survey month, x_{t-1} , the next month's position, x_t is adjusted for valuation changes, V_t , using a combination of standard price indexes of U.S. or foreign securities. The combination of price indexes is chosen to approximate the portfolios held by foreign and U.S. investors as indicated by earlier surveys. Next, the current month's net transactions, S_t , are added. Finally, adjustments, A_t , are included to account for repayment flows of principal on asset-backed agency securities, acquisitions of equity through stock swaps, and transactions in nonmarketable Treasury bonds. We refer to these estimates as the Survey-S estimates.

As noted in Bertaut and Tryon (2007), however, there are often considerable discrepancies between the reported survey positions and position estimates derived from the monthly transactions data as published by the Treasury. At the individual country level, such discrepancies are largely due to the transactions bias in TIC S reporting. Constructing estimated positions based on the country-level monthly transactions data tends to generate estimates of holdings by residents of such financial center locations that considerably overstate actual holdings as reported in the next survey, and will tend to underestimate holdings by residents of other countries.

¹⁷ Monthly transaction data and annual survey data are integral to the BEA's estimate of holdings in the annual International Investment Positions (IIP) publication. The BEA also uses the information obtained from TIC S and survey data in calculating investment income and financial flows in the U.S. Balance of Payments statement.

Figures 3 and 4 illustrate both sides of this problem for holdings of U.S. Treasury bonds by the United Kingdom, a transactions center, and holdings of U.S. Treasury securities by Russia, whose transactions are apparently often executed offshore. The blue lines indicate estimated positions based on the previous year's survey, cumulated transactions from the TIC S, and adjustments for valuation changes. The dots indicate reported survey positions. For the United Kingdom (Figure 3), estimated positions, even after adjusting for omitted securities and valuation changes, are consistently much higher than the survey results, presumably representing transactions in U.S. securities made in the United Kingdom on behalf of third parties. Conversely, estimated positions for Russia (Figure 4) are much lower than reported positions in most recent years, which presumably reflect transactions conducted via overseas accounts. More generally, because of the transactions bias, our position estimates could give a misleading impression about which country is buying U.S. securities, and how U.S. and foreign investors are adjusting their portfolios.

3.5. Previous monthly position estimates

Because of interest in generating between-survey estimates of cross-border holdings, Bertaut and Tryon (2006) combined annual survey data and monthly transactions data to generate monthly estimates of holdings, by country of foreign holder (for U.S. securities) and country of issuer (for U.S. holdings of foreign securities). The Bertaut-Tryon dataset, updated with release of each survey through June 2011 also includes a decomposition of monthly changes in these holdings into recorded net flows (adjusted for unrecorded transactions such as flows resulting from periodic repayments of principal on asset-backed securities and stock swaps arising from corporate mergers and take-overs), estimated valuation changes arising from stock or bond price changes and exchange rate changes, and a monthly residual "gap" reflecting the

apparent over- or under-statement of the valuation change estimates when new survey data became available.

As helpful as these monthly position estimates are, they nonetheless have shortcomings. New estimates from this methodology are available only when a new survey is available; as noted above, estimates of cross-border holdings are typically not available for eight to ten months from the reporting date, and so estimated flows based on the Bertaut-Tryon method can lag by a year or more.¹⁸ Thus, these estimates are not particularly useful for understanding “real-time” portfolio shifts in response to current market developments. In instances when the transactions bias in the TIC S data generates a particularly large survey “gap”, it is frequently difficult to assign the gap to a particular month. Thus, monthly changes in portfolio shares based on the estimated positions are necessarily imprecise. Finally, although Bertaut-Tryon proposed a method for estimating monthly positions beyond the last survey date, these estimates can be subject to considerable error, especially when recent movements are large or do not conform to historical patterns.

4. The TIC SLT: Building on the TIC S and the survey

4.1. Background

Analysis of the financial crisis that began in late 2007 highlighted the importance of collecting timely information on cross-border securities positions: As the crisis unfolded, accurate and timely position information was not available. When the 2008 survey results were released in late 2009, they indicated different trends than the earlier TIC S had provided. The

¹⁸ For example, consider data for foreign holdings of U.S. securities as of December 2010. For this date, Bertaut-Tryon estimates would have been available when the final survey data for June 2011 were released, or around April 2012—16 months later.

differences between the TIC S estimates and the survey data received later were due to the measurement and estimation problems mentioned above: Transactions bias likely resulted in underreporting of purchases of EME securities, especially those issued in international markets, while redemptions of the same bonds would have been correctly attributed to the issuing country. In addition, transactions that resulted in changes in U.S. residents' holdings of foreign securities appear to have been conducted by financial intermediaries that were not part of the reporting panel of the TIC S.

Additional securities reporting to address the shortcomings of the TIC survey and TIC S had been under consideration prior to 2007, but the crisis accelerated the development and introduction of the TIC SLT “Aggregate Holdings of Long-Term Securities by U.S. and Foreign Residents,” which addresses many, though by no means all, of these shortcomings. Relative to the survey, the SLT provides much more timely and frequent reporting; relative to the TIC S, the TIC SLT provides market-value reports of actual holdings rather than flows. During the process of developing and introducing the SLT, considerable efforts were made to ensure that all reporters meeting the reporting threshold—especially hedge funds, private equity firms, and other types of managed funds—understood how to report correctly.

Despite these improvements, the SLT is not perfect, and custodial bias in particular remains a challenge. In addition, the older elements of the TIC reporting system—the TIC S and the annual surveys— remain important as complements to the TIC SLT. The TIC S remains the timeliest indicator available of cross-border securities flows—actual cross-border securities acquisitions or sales—and, along with the SLT, allows us to decompose position movements into recorded transactions, valuation changes, and “gaps” that reflect unrecorded transactions or

errors in valuation estimates.¹⁹ Similarly, the survey data function as a useful cross-check. In principle, the SLT and survey data for the same dates should be nearly identical, but reporting differences have emerged. The detailed information provided by the survey allows for followup with reporters and, if needed, revisions.

The recent financial crisis offers at least three examples of the added usefulness of survey data, even though it arrives with such a long lag. First, the survey provides the most detailed information available about the distribution of investment flows between valuation changes, or “passive” changes, and purchases or sales, or “active” changes. Over the course of 2008, the survey confirmed that U.S. investors’ holdings of foreign equity declined \$2.5 trillion, or nearly 50 percent. In isolation, this figure might indicate that U.S. investors were abandoning foreign equities. However, analysis of price changes and position changes at the security level revealed that the change was nearly all due to declines in valuation: After adjusting for price changes, U.S. net sales of foreign equity amounted to only about \$10 billion, or less than 1 percent of the overall change. Second, the security-level reporting on the survey also can illuminate trends in cross-border portfolio composition that are difficult to identify otherwise. For example, the survey data allow analysis of exposures, by country and sector, to securities whose values are changing rapidly, such as ABS.²⁰ Finally, the survey will allow for confirmation that positions reported in aggregate on the SLT are calculated correctly. For example, it can sometimes be difficult for reporters to distinguish between securities issued in the U.S. market by foreign entities (considered to be foreign securities by the TIC system) and similar securities issued by

¹⁹ Beginning with the December 2011 report, the TIC SLT collects data monthly just as the TIC S does. However, the filing deadline for the TIC SLT is a bit later and, at least in the short run, the more intensive data review process required for a new form will result in later release of the TIC SLT data than the TIC S data.

²⁰ See Beltran, Pounder, and Thomas (2008).

the U.S. subsidiaries of such foreign entities (considered to be U.S. securities by the TIC system). By examining the detailed security-level data reported in the annual surveys, proper guidance can be provided to reporters regarding classifications of such securities holdings.

Taken together, the combination of the more-frequent positions data from the SLT, the monthly transactions data, and the annual surveys together result in a more complete and accurate system for recording cross-border flows and positions. Although the exercise of reconciling changes in cross-border holdings of securities between recorded transactions, valuation changes, and sources of “gaps” has long been conducted for the annual surveys, with resulting improvements in valuation estimates and clarification of reporting responsibilities to collect missed TIC S transactions, the more timely SLT holdings data allow for this type of analysis to be conducted more frequently and on a much more timely basis.

4.2. Data collected on the SLT

The SLT collects monthly data on own and custodial cross-border positions in long-term securities at market value by country of holder for U.S. liabilities to foreigners and by country of issuer for U.S. claims on foreigners.²¹ Table 1 displays a summary of the SLT reporting form. The first eight columns collect data on U.S. liabilities to foreigners by country for four broad security types—U.S. Treasuries, U.S. agency bonds, U.S. corporate bonds, and U.S. corporate stocks. For each U.S. security type, holdings must be divided into official (FOI) and other holdings. The ninth column is for total U.S. securities, the sum of the first eight columns. For foreign securities, the last four columns of the table, the SLT collects data on government bonds, corporate bonds, corporate stocks, and total holdings. Finally, for total positions across all

²¹ Position information for short-term securities is already collected on the TIC B forms. See Appendix 1 “TIC Reporting Overview” and www.treasury.gov/resource-center/data-chart-center/tic/Pages/forms-b.aspx.

countries, reporters must provide information on several memorandum items, including ABS positions, fund-share positions, and the sector of the holder (for liabilities) or issuer (for claims).²² In the table, the gray boxes indicate categories that are not reportable because they are not applicable for the security type indicated.

The SLT form has two parts, A and B, for reporting of custodial and issuer or end-investor holdings, respectively. Although the structure of the SLT form parallels the TIC S in many respects, the differences reflect efforts to bring TIC reporting in line with recent initiatives to improve and harmonize data on this topic.²³ In particular, the categories for the sectoral breakdowns were selected to meet the standards established in the sixth edition of the *Balance of Payments and International Investment Position Manual*, 6th edition (BPM6), and the separation of holdings into own and custodial holdings parallels reporting on the annual TIC surveys.

**Table 1: Summary of Data Collected on the TIC Form SLT
(Aggregate Holdings of Long-Term Securities by U.S. and Foreign Residents)**

Country or Memo Item	U.S. Securities Liabilities to Foreign Residents								U.S. Securities Claims on Foreign Residents				
	U.S. Treasuries		U.S. Agencies		Corporate bonds		Corporate stocks		Total U.S.	Govt. bonds	Corp. bonds	Corp. stocks	Total
	FOI	Other	FOI	Other	FOI	Other	FOI	Other					
Country name													
...													
Memorandum items													
Type of security													
Asset-backed securities													
Fund shares													
Type of U.S. issuer													
Depository institutions													

²² Forms and instructions are available at www.treasury.gov/resource-center/data-chart-center/tic/Pages/forms-slt.aspx.

²³ For more details, see Brandner, Cai, and Judson (2011).

Other financial organizations				
Non-financial organizations				
State and local general government				
U.S. holder type				
Depository institutions				
Other financial organizations				
Non-financial organizations				

The SLT data are much more timely than the position data from the annual surveys: currently, SLT data are released with a lag of about two and a half months, one month longer than the lag for the monthly S data. SLT data are now available for use in quarterly international investment position calculations with a lag of less than one quarter, as specified in BPM6.

In addition to the new items collected on the TIC SLT, two factors resulted in a significant expansion of the SLT reporting panel relative to the TIC annual survey panel. First, the reporting threshold is a bit different, and is generally lower. Second, significant outreach efforts were made in order to inform managers of hedge funds, private equity funds, and other types of managed funds of potential reporting responsibilities. As part of these efforts, instructions and other materials to clarify the reporting responsibilities of such entities were developed.²⁴ These factors resulted in an increase in the number of reporters from about 100 on each of the non-benchmark annual survey panels to over 300 on the SLT.

4.3. SLT shortcomings

Despite the considerable value of the monthly data available in the SLT, we continue to regard the data from the annual surveys as the best measure of actual cross border holdings.

²⁴ These materials, which include FAQs and flowcharts, are available at www.treasury.gov/resource-center/data-chart-center/tic/Documents/slt_faqs.pdf and www.treasury.gov/resource-center/data-chart-center/tic/Documents/slt_flowcharts.pdf.

Because the annual survey data are collected at the underlying security level, they can be subject to more detailed analysis and error correction than can data reported in aggregate. Securities prices can also be cleaned and adjusted to correctly reflect prices as of the actual survey date, and to ensure that foreign-currency denominated securities are converted to the dollar values at the correct exchange rates. One area where data have been subject to considerable review and price correction has been for cross-border holdings of asset-backed securities, particularly securities issued in the run-up to the global financial crisis. Because many of these securities currently do not actively trade, it can be difficult for reporters to assess the actual value of these holdings (See Bertaut and Pounder (2009)).

Misreporting can also be more easily addressed in the annual surveys. For the U.S. claims surveys, it is possible to distinguish between securities issued by foreign companies (which are included as foreign securities) and those issued by U.S. subsidiaries of foreign companies (which are considered U.S. securities in the TIC system), and to remove such U.S. securities from the claims survey aggregates. Corrections to country assignments can also be carried out as necessary. For example, reincorporations can change the effective country of issuer of securities: recently, several multi-nationals such as XL Capital, Ltd. and Weatherford International formerly incorporated in the Cayman Islands have reincorporated in Ireland and Switzerland, respectively. With the security-level data in the surveys, it is possible to ensure that securities issued by these firms are properly attributed to Ireland or Switzerland. The detailed data also allow for an important “overreporting” adjustment for the liabilities data. To get comprehensive data on U.S. corporate bonds held by foreign investors, the surveys collect data from both U.S. custodians who hold securities on behalf of foreign investors, and U.S. companies who directly issue securities in foreign markets. Because some of the foreign-issued

securities holdings are sometimes also reported by custodians, these holdings may be double-counted. However, because the surveys are collected at the individual security level, it possible to cross-check the securities reported by the issuers with those reported by custodians to eliminate double-counting. Because the SLT collects data from both custodian and issuers, this double counting most likely exists in the SLT data, but without the security-level detail it is impossible to determine how large the problem is.

There are also slight differences in reporting panels and reporting thresholds for the SLT and the annual surveys. The most comprehensive reporting is collected from “benchmark” surveys, conducted every five years, which aim to be fully comprehensive. Annual surveys are collected from a smaller set of respondents, but the data are adjusted in order to make the totals from annual survey years comparable to the totals for benchmark years.²⁵

5. Constructing position estimates with the SLT

With the availability of the SLT, we are able to construct securities position estimates for months between surveys with greater accuracy.²⁶ Our method is very similar to the Bertaut-Tryon approach, but is much simpler because the SLT data have generally tracked the survey

²⁵ Specifically, since the introduction of the SLT, these adjustments have been made as follows. First, reporters that are on the SLT panel but not the annual survey panel are identified. Second, for these reporters, SLT positions from the survey month are aggregated by country and security type for a group of about fifty countries that cover the vast majority of these positions in dollar value terms. Third, for each country and security type, the distributions of relevant security characteristics (maturity structure, currency composition, industry distribution, etc.) are calculated from the annual survey data. Fourth, for each country and security type, a synthetic security is defined for each combination of country, security type, maturity, currency, industry, and other characteristics. The value of each security is the dollar value as in the second step multiplied by the distribution as in the fourth step. Fifth, a dollar value threshold is set based on the tradeoff between overall dollar value coverage and number of synthetic securities. The dollar value threshold for individual securities has typically in the range of \$1 million. Sixth, the dollar values of the synthetic securities are included in all reported calculations.

²⁶ In principle, it is also possible to use the aggregate SLT data to decompose monthly position changes into price changes and net transactions. However, constructing price change estimates is challenging, and as yet we are not comfortable with existing index-based price change estimates, especially for corporate securities. As a result, we continue to observe substantial “gaps” between the estimated change in position and the estimated contributions of transactions, valuation changes, and coverage changes and shifts.

data well. In brief, we use the most recent survey data as a starting point, and then use changes in the SLT to generate monthly updates of positions. The positions thus generated are corrected and adjusted when the following year's survey comes in. We present here estimates beginning in June 2011 for U.S. liabilities to foreigners, and beginning in December 2011 for U.S. claims on foreigners. For claims, we are able to show one year of SLT-based estimates which are adjusted based on the following year's survey plus several additional months which cannot yet be adjusted. For liabilities, we are able to show nearly two years of SLT-based estimates (June 2011 – June 2013) which are adjusted based on past surveys as well as several additional months which cannot yet be adjusted.

5.1. The general approach

Beginning with January 2012 for U.S. claims on foreigners, and beginning with July 2012 for U.S. liabilities to foreigners, we construct estimates of position P_{ijt} , for country i , security type j , and date t as follows. First, we calculate the ratio, R_{ijy} of the value of survey reporting to SLT reporting for the country and security type as of the most recent survey date. We use this ratio to scale changes in the reported SLT positions from month to month, so that estimated positions for the months following the most recent survey are:

$$P_{ijt} = P_{ij,t-1} + R_{ijy} * dSLT_{ijt} \quad (2)$$

Given that the SLT and survey generally track one another closely in survey months, we expect that these estimates for the following survey date should be pretty close to the actual survey findings. However, we revise the estimates when the next survey data become available. When we have the ratios R_{ijy} for the following year, we calculate a monthly R_{ijt} as the moving average of the ratio from the current and previous year, or $R_{ijt} = ((12-m)/12) * R_{ij,y-1} + (m/12) * R_{ijy}$, where m is the number of months since the previous survey. The ratios are generally close to

one another from year to year, and are generally close to 1: means and medians for all security types are between 0.96 and 1.03, and for countries with positions in excess of \$10 billion, the ratios are all between 0.87 and 1.11 for domestic securities. For foreign securities, there are a handful of exceptions to these ranges; the exceptions are concentrated in countries with significant reporting by managed funds or significant positions in ABS. For these types of securities, valuation is inherently more problematic and so it is not surprising that the SLT and survey reporting varies more.

For U.S. claims on foreign residents, we have survey data from the December 2011 and December 2012 surveys. Figure 5 shows estimated monthly positions for foreign bonds held by U.S. residents from December 2007 through December 2013. The gray lines indicate ex-post estimated positions based on TIC S flows and annual survey data using the Bertaut and Tryon (2007) method. The blue lines indicate real-time position estimates based on the most recent survey and TIC S transactions. The red line shows the SLT-based position estimates. Due to the scaling mentioned above, these SLT estimates are by construction equal to survey positions at survey dates. As can be seen, as of early 2013, the SLT data through 2012, the red line, indicated a considerably larger increase in U.S. holdings of foreign bonds—about \$285 billion—than the S-based estimates, the blue line, which pointed to a position increase of only \$80 billion.²⁷ In addition to the overall differences in magnitudes, the changes in positions and estimated transactions can also indicate different patterns; some examples are reviewed in section VI.

²⁷ Indeed, the raw data presented here differ from the data published by the BEA on flows. As noted previously, we continue to observe significant gaps between the overall position change as reported on the SLT and the portions of the change accounted for by transactions as reported on the TIC S, estimated valuation change, and changes in coverage. The BEA considers a variety of factors to produce its figures on transactions.

5.2. A special case: constructing estimates based on early and incomplete SLT data

As noted above, SLT data were first collected in September 2011, and monthly data collection began in December 2011, so that monthly change data are available beginning in January 2012. In addition, the SLT reporting panel was substantially larger than that for the previous surveys: the number of reporters on the SLT panel is roughly double that of the annual survey panels, and the increase in coverage in dollar value was about \$300 billion for U.S. liabilities to foreigners and about \$400 for U.S. claims on foreigners.²⁸ In both cases, the increase was concentrated in equities and in positions against the Caribbean.

For U.S. claims on foreigners, the new calculation is fairly straightforward, for two reasons. First, the 2011 SHC was a benchmark survey: all reporters meeting the SHC reporting requirements were included in the panel. In addition, the December date of the claims survey provides a good breaking point. As a result, we begin the new Survey-SLT time series in January 2012, the first month following the December 2011 SHC and also the first month for which monthly SLT changes can be calculated.²⁹ In the decomposition of changes, we assign the new reporting on the SLT to December 2011.

For U.S. liabilities to foreigners, the calculation is slightly more complicated for the period from July 2011 through June 2012. Broadly, we construct third-quarter positions based on the June 2011 liabilities survey, S transactions and estimated valuation change in July, August, and September, and the difference between the September 2011 positions implied by this approach and the September positions reported on the SLT. For the fourth quarter, we

²⁸ See Brandner, Cai, and Judson (2012) for more details.

²⁹ Our data files provide an update of the Bertaut-Tryon claims estimates through December 2011 using a panel consistent with that in the December 2010 survey, and then provide an additional data file of the expanded panel coverage in December 2011 so that users can correctly account for the “coverage change” that applies in December 2011 by country.

follow a similar approach, though we use the scaled September 2011 positions as a baseline for October, November, and December. Beginning with January 2012, when monthly SLT change data first become available, the approach is very similar to that described above. The calculations for corporate stocks for all countries are presented in Table 2. For the months from July 2011 through November 2011, we generate estimates as follows.

1. Calculate the initial position using the Survey-S method, with the June 2011 survey position (Column 1) as the base. For July and August 2011, the values are calculated as the previous month's value plus transactions as reported on the TIC S (column 2) and estimated valuation change (column 3). These estimated positions are shown in column 4. For October through December 2011, the estimates are calculated as the new September 2011 value (column 10) plus cumulative TIC S transactions and estimated valuation change beginning in October 2011.

Table 2: Example of Calculation of Liabilities Positions: Corporate Stocks, All Countries
Millions of dollars

	SHL value	S	Val. Chg.	Survey- S	SLT scaled by SHL/SLT	Gap*	Gap shares	Gap and coverage adj. **	New series	
	(1)	(2)	(3)	(4)	(5)	(6)	(7) =(4)-(6)	(8)	(9)	(10)
Jun 2011	3,830			3,830						3,830
Jul 2011		-1	-79	3,750				0.36	9	3,760
Aug 2011		-7	-216	3,527				0.34	9	3,546
Sep 2011		-19	-259	3,249	3,570	3,543	26	0.31	275	3,543
Oct 2011		3	352	3,897	ND			0.33	-22	3,875
Nov 2011		-7	-20	3,870	ND			0.33	-22	3,826
Dec 2011		-11	27	3,886	3,850	3,820	-66	0.33	-22	3,820
Jan 2012		4	165		4,058	4,026				4,026
Feb 2012		10	156		4,242	4,209				4,209
Mar 2012		5	119		4,365	4,331				4,330
Apr 2012		2	-29		4,329	4,295				4,295
May 2012		2	-257		4,071	4,039				4,039
Jun 2012	4,237	-3	143		4,271	4,237				4,237

Notes:

*September 2011 value excludes change in coverage of \$267 billion.

**September 2011 value includes change in coverage of \$267 billion.

2. Calculate the scaled SLT positions using the ratio of SLT values (column 5) to SHL survey reporting for the June 2012 survey date, the first date for which such a

comparison is available. These scaled values are shown in column 6. For corporate stocks, the ratio is 0.9921.

3. Calculate the change in coverage from the SHL to the survey, which is defined as the sum of all SLT reporting from non-SHL reporters. In general, assign the change in coverage entirely to September 2011, the debut month of the SLT.³⁰ The total change in coverage was \$267 billion.
4. Calculate the difference between the September scaled SLT position and the Survey-S estimate, or the “gap” *excluding* the change in coverage. In the example below, the difference between the September Survey-S value of \$3,249 billion (column 4) and the scaled SLT value of \$3,543 billion (column 6) is \$293 billion, but we subtract the \$267 billion that is due to new reporting. The gap values are shown in column 7. Allocate the gap to July, August, and September proportionately based on the Survey-S estimated position (column 4) in each month. The monthly shares are shown in column 8, and the monthly gap values are shown in column 9.
5. The June 2011 position is set to be equal to the SHL value. For July and August 2011, the position estimate is the Survey-S estimate plus the cumulative gap for July and August 2011. For September 2011, define the position estimate as the Survey-S estimated position (column 4) plus the cumulative gap for July, August, and September 2011 plus the increase in coverage of \$267 billion.

Beginning in December 2011, we can use the standard approach described above, with one exception: as for the months from July through November 2011, we scale the SLT using the ratio of SLT to SHL reporting for June 2012.

6. Characteristics of the new SLT-based positions

In principle, the positions as reported by the SLT would correspond closely to the estimates constructed from annual survey positions and monthly transactions as reported on the TIC S, but, as noted above, transactions bias often results in very different estimates. The data received so far indicate that SLT reporting is quite accurate: we now have SLT data for two claims surveys (December 2011 and December 2012) and two liabilities surveys (June 2012 and

³⁰ We include as a changes in coverage very significant data revisions for agency securities held by residents of Taiwan and Hong Kong. These revisions applied to data back to December 2011, and so we assign the corresponding change in coverage to December 2011.

June 2013). In all four cases, SLT and survey reporting was very close.³¹ Overall, we are generally comfortable with the positions as reported on the SLT. To date, the SLT has been providing a different picture of securities flows than the S alone, and that information has been available much sooner than it would have been with the combination of survey and S data.

6.1. Aggregate data: 2012 and 2013

As with the original Bertaut-Tryon data set, our methodology also allows the monthly changes in securities positions to be decomposed into recorded flows, estimated valuation changes, and monthly gaps. Because the “gaps” can now be assessed and assigned monthly, they can help provide a clearer idea of whether they arise from transactions bias that affects the country allocation, missed transactions overall, errors in valuation estimates, or custody shifts that generate changes in coverage.

6.2. Significant gaps

For example, the Bertaut-Tryon claims data show persistent negative gaps for U.S. holdings of bonds for Belgium and Luxembourg, indicating that most recorded purchases of bonds from these countries overstate U.S. investors’ actual acquisitions bonds of these countries. This result is not surprising, given that both countries are major centers for global bond issuance, and thus recorded net purchases through them likely reflect acquisitions of newly-issued bonds of many different countries. Likewise, persistent positive gaps for many other countries indicate that recorded net sales for these countries likely reflect the fact that redemptions of bonds at maturity are usually recorded against the country of issue, whereas the initial acquisition of the

³¹ Of course, Board and FRNBY staff compare the reporting from the surveys and the SLT at several different levels of aggregation during the data review process, and discrepancies are addressed with reporters at this stage. As a result, the final published survey positions should be close to those on the SLT.

bond may well be recorded against Belgium or Luxembourg. The new monthly series indicate just how highly (negatively) correlated recorded flows and monthly gaps are for foreign bonds for many countries, providing considerable support for the interpretation that, for foreign bonds, much of the monthly gap at the country level can be thought of as “misallocated transactions” resulting from the bias of Belgium, Luxembourg, and the United Kingdom as centers of global bond issuance and transactions. Figure 6 shows the average monthly recorded transactions and gap for countries with large average gaps and significant negative correlations between the gaps and the transactions over time.

Our analysis suggests a somewhat different interpretation may be appropriate for gaps in U.S. holdings of foreign equity. Figure 7 shows that estimated valuation changes by far contribute the most to monthly changes in holdings of foreign equity, dwarfing the contribution from monthly transactions. But our monthly decomposition shows that gaps can also be sizable, and appear to be negatively correlated with valuation changes, suggesting that we may be overestimating how big these monthly price swings are. Figure 8 shows that this problem seems especially pronounced for holdings of Cayman Islands equity: indeed, the correlation coefficient between the monthly gaps and valuation changes is a highly significantly $-.89$. A possible explanation is that our valuation estimates overstate price changes because we cannot properly account for the diverse nature of equity issued from the Cayman Islands. The Cayman Islands is a large center for fund incorporation, and the detailed survey-level data show that more than half of our holdings of Cayman equity are in the form of fund shares, with additional sizable holdings of limited partnership shares and equity other than common stocks. Our valuation procedure is to apply stock price indexes (typically the MSCI) to estimate valuation changes, but if a sizable portion of our holdings are in funds – which can include bond funds, commodity funds, and

money market funds – changes in the MSCI may well overestimate actual valuation changes. This tendency to over-estimate valuation changes on cross-border holdings of equity may have become more pronounced as a result of both the growth of the fund industry in offshore centers as well as the targeted outreach to fund managers that resulted in the expansion in coverage in 2011: holdings of common stock are currently about 83 percent of total foreign equity held, well below the 93 percent held in December 2010. Valuations errors may also be an explanation for “gaps” in our estimates of changes in foreign holdings of U.S. equity. Common stock has long accounted for a somewhat smaller share of U.S. equity held by foreign investors but this share has also declined somewhat with the increase in coverage in 2011: about 76 percent of U.S. equity held by foreign investors in June 2013 was common stock, compared with about 80 percent in 2010 and 2011.

6.3. Specific countries

6.3.1. United Kingdom transactions and positions in U.S. Treasuries

The distortion in estimated holdings constructed from summing foreign net purchases of U.S. securities since the previous annual survey for the United Kingdom (a major financial transactions center) has long been recognized, with each new survey revealing that actual holdings attributed to the U.K. fall well short of estimated holdings built up from estimated transactions (Figure 9A). With the SLT, we can now see on a monthly basis just how much of recorded net transactions for the U.K. actually reflects net transactions for other countries: for U.S. securities, gaps for the U.K. are almost equal and offsetting to recorded transactions, especially for Treasuries and agencies (Figure 9B). Indeed, the correlation coefficients for net transactions and monthly gaps are $-.973$ for Treasuries and $-.952$ for agencies.

6.3.2. Belgium's Treasury positions

Holdings of Treasuries in Belgium (Figures 10A and 10B) present another special case where care needs to be taken to reconcile recorded flows with changes in holdings. Over the past few years, foreign holdings of Treasury bonds in Belgium have grown dramatically, from about \$20 billion in June 2009 to nearly \$250 billion by December 2013. Two features of Belgian holdings are worth attention. First, these increases have occurred with essentially no recorded net purchases. Second, holdings have grown dramatically relative to the size of the Belgian economy, to the point where Treasury holdings at end-2013 amount to roughly half of the value of Belgium's GDP.³² But there is a fairly straightforward interpretation for the increased holdings. Belgium, the location of Euroclear's headquarters, is a major custodial center, and holdings attributed to Belgium most likely reflect third-party foreign holdings rather than holdings of Belgian residents. However, Belgium is not a major center for financial transactions, so relatively few purchases of Treasuries are actually conducted through Belgium.³³ Moreover, the new monthly gap series now available with the SLT show that, over the past couple years, Treasury holdings in Belgium have not increased in a smooth pattern, but instead show periodic very large increases, with especially sizable jumps in January 2013 and December 2013. A likely interpretation of such sporadic sizable increases is that in addition to purchases recorded through a financial transactions center such as the United Kingdom, the large increases also reflect shifts in custodial holdings from a custodian outside of Belgium to one in Belgium. Such custody shifts do not reflect changes in foreign ownership of Treasuries that would trigger TIC S

³² By contrast, Treasury holdings for Germany and France were less than 2 percent of their respective GDPs at end-2013.

³³ More recently, net transactions data show small net sales for Belgium. These most likely reflect maturities and redemptions of the (now large) stock of Treasuries held.

transactions reporting. These developments suggest some caution in interpreting the “gaps” for Belgium: because the increased holdings likely reflect purchases recorded elsewhere and at times held with other custodians, there is less reason to interpret the Belgian Treasury “gap” as missed transactions that should be assigned to Belgium.

6.3.3. Cayman Islands Treasury positions

Holdings of securities in the Cayman Islands present a third “special case,” illustrated in Figures 11A and 11B. The Cayman Islands is also a major transactions center as well as a custody center and location for numerous hedge and other managed funds. The availability of monthly SLT data highlight a recent and somewhat puzzling trend with respect to Cayman Islands transactions in Treasuries that had been difficult to interpret when position data was available only annually and with a considerable lag. From June 2010 to June 2011, the TIC S data indicated net sales of Treasuries by entities in the Cayman Island amounting to nearly \$30 billion, but when results of the June 2011 survey became available, they showed that holdings in the Caymans had actually edged up somewhat, from \$36.3 billion to \$47.1 billion. A similar and even more pronounced selling trend re-emerged beginning in June 2012 through the end of 2013, with net sales amounting to nearly \$125 billion while reported holdings of Treasuries on the SLT indicate an increase in holdings from \$58 billion in June 2012 to \$81 billion by year-end 2013. Additionally, the monthly data show that months with large sales of Treasuries from the Cayman Islands as recorded on the TIC S are not associated with actual declines in holdings of Treasuries as reported on the SLT. In fact, the correlation coefficient for Caymans transactions and the Caymans monthly gap is a highly significant -0.955 . A possible explanation for the notable discrepancy is that the transactions data over this period have included a significant portion of “short sales” – possibly associated with growing securities lending demands – undertaken by

intermediaries in the Caymans. Short sales – that is, sales of securities that have been borrowed – are reported on the TIC S along with regular sales. However, the holdings data do not include the short positions of entities undertaking the short selling, nor do they include borrowed securities. Thus, this type of activity will necessarily generate a mismatch between holdings and recorded flows, and may be a growing feature of the transactions versus holdings for the Cayman Islands and potentially for other regions where such activity may be increasing.

A further implication of increased short sales activity is that not only are foreign short positions (that is, the negative holdings of foreign intermediaries who borrow and then sell Treasuries) not captured when conducting surveys of foreign ownership, but this activity can also result in double counting of ownership. For example, if a U.S. intermediary conducts a short sale by borrowing a Treasury from a foreign entity and then sells it to a different foreign entity, correct reporting would have the security counted as foreign-held twice: it would be reported as held by both the original foreign lender and also by the new foreign purchaser on the other side of the short sale arrangement.

6.3.4. China's holdings of Treasuries

The SLT and the TIC S also provide different information for China's Treasury holdings (Figures 12A and 12B). As measured by the annual surveys (at least through June 2011), holdings of Treasuries attributed to China tended to be larger than recorded net purchases. The larger measured holdings than could be accounted for by transactions most likely reflected purchases in offshore markets which then were held with U.S. custodians. However, the SLT monthly data are showing some new patterns for Chinese Treasury transactions and holdings. First, from June 2011 to June 2012, holdings recorded for China declined by roughly \$160 billion. However, recorded transactions showed net sales of only -\$27 billion, and our estimates

suggest actual valuation gains over this period. Comparing the monthly SLT changes with recorded transactions and valuation estimates indicates several months of sizable negative “gaps”, at times even offsetting recorded net purchases. One possible interpretation of the negative gaps is that these decreases reflect custodial shifts from a U.S. based-custodian to one abroad. Data since June 2012 show a somewhat different pattern. For some months, China’s holdings of Treasuries have increased by more than accounted for by net purchases and valuation changes: a return to the earlier pattern where China’s purchases of Treasuries likely occurred in offshore financial markets. However, for other months – most notably January 2013, June 2013, and December 2013 – “gaps” were again negative and sizable, suggesting that once again holdings may have been shifted to foreign custodians. These changing developments suggest some caution in interpreting China’s “gaps”: positive monthly gaps likely reflect purchases in offshore centers. But negative gaps – especially large ones such as in January and December of 2013 – likely reflect further custodial shifts, and thus should not be thought of as missed transactions.

6.3.5. Foreign official holdings of Treasuries and other U.S. securities

For a final special case on the U.S. liabilities side, we find that our new estimates also give more complete information about total foreign official acquisitions of U.S. securities, especially Treasuries (Figures 13A and 13B). Similar to the case with China’s holdings and transactions described above, total foreign official holdings of Treasuries in the annual surveys through June 2011 have tended to be larger than recorded net purchases for official investors.³⁴ And as with the case for China, the larger measured holdings suggest purchases in offshore

³⁴ Information on the split between official and private investors at the individual country level is not publicly available, but the TIC system does provide information on total foreign official investment activity.

markets –recorded as transactions with private intermediaries – that were then held with U.S. custodians where the holdings are correctly attributed to official investors. The SLT data show that in aggregate, this same pattern has continued through 2012 and 2013, with our monthly decomposition showing large positive gaps. We tend to interpret the positive gaps as likely indicating additional official acquisitions that have likely taken place in offshore financial markets. But our decomposition also show some months with fairly large negative gaps, suggesting that custody shifts to foreign custodians may be taking place. Importantly, shifts to foreign custodians may result in an under-count of total foreign official holdings of U.S. securities, because, as noted in Section III above, such holdings will then be recorded on the annual liabilities surveys and on the SLT as held for a private intermediary (the foreign custodian bank) located in the foreign custody center.

6.3.6. U.S. investment in euro area peripheral debt

The newly available monthly data can also provide much more clarity on U.S. investor appetite for foreign securities issued by different countries. For example, comparing the annual claims survey data for December 2011 and December 2012 reveals a sizable increase in U.S. holdings of euro area peripheral debt, with holdings of Spanish bonds increasing more than 40 percent to nearly \$33 billion and holdings of Italian bonds more than doubling to \$55 billion. However, monthly transactions data do not capture these purchases, with the TIC S data actually showing net sales of Spanish and Italian bonds. This discrepancy indicates that purchases of peripheral euro area bonds largely occurred through other financial centers, while reported net sales likely reflect redemptions of maturing bonds that are correctly assigned to the country of issue. However, the large discrepancies apparent in the annual data make it very difficult to conclude when the purchases of euro area peripheral debt occurred. These increases in foreign

bonds are also apparent in the monthly SLT data, and also provide clear information on when these acquisitions occurred.

For Italy (Figures 14A and 14B) and Spain (Figures 15A and 15B), SLT holdings did not begin to rise until August and September of 2012, shortly after Italian and Spanish bond spreads began to decline after ECB President Mario Draghi stated in a speech in late July 2012 that the ECB stood ready to do “whatever it takes to preserve the euro.”³⁵ Moreover, the SLT data indicate that U.S. investors have actively managed their holdings of peripheral debt, selling off most of the increase in their holdings over the first half of 2013, but then stepping back in to reacquire both Italian and Spanish bonds beginning in August 2013.

6.3.7. U.S. Investment in Emerging Market Economies (EMEs)

Finally, the new SLT data provide much more timely information on U.S. investors’ demands for securities of emerging market countries, improving our ability to analyze changes in demands for EME securities, especially during periods of financial market stresses such as in 2013 (Figures 16A, 16B, and 16C). Increased issuance of EME bonds – especially Asian and Eastern European bonds – through financial centers and increased global demand for EME securities has made the financial transactions bias in the TIC S data increasingly problematic. For example, relying just on the TIC S transactions data suggests that U.S. investor purchases of EME bonds have dwindled since the global financial crisis, declining from about \$25 billion in 2009 to roughly \$15 billion each in 2010 and 2011 before turning to net sales in 2012. However, the annual surveys show that U.S. acquisitions of EME bonds actually strengthened over this period, with purchases of about \$50 billion in both 2010 and 2011, and our SLT-based estimates

³⁵ Speech by Mario Draghi at the Global Investment Conference, London, July 26 2012. <https://www.ecb.europa.eu/press/key/date/2012/html/sp120726.en.html>

show a further pickup to about \$80 billion in 2012. This growing discrepancy makes analysis of portfolio flows to EME countries during periods of market turbulence especially problematic.

The TIC S indicates further net sales of about \$20 billion in EME bonds in 2013. In contrast, the SLT data indicate that U.S. investors in fact continued to buy EME bonds over 2013, albeit at a noticeably slower pace than in prior years: the data suggest small net sales of about \$4 billion only in Q2, and net purchases of about \$28 billion for the year as a whole.

7. Conclusion

Our analysis indicates a high degree of confidence in the aggregate data collected on the new TIC form SLT. After two years of data collection, the positions reported on the SLT are very close to what is reported on the more detailed (security level) surveys, providing a much more timely snapshot of how U.S. cross-border portfolios are evolving than had previously been available. Our analysis also shows how flows implied by changes in the TIC SLT (after accounting for valuation change) are frequently at odds with transactions reported on the TIC S. For example, our new estimates indicate much stronger purchase of emerging market bonds over the past two years than reported on the TIC S. To some extent, these differences are due to structural factors that we understand: They occur in countries that we know are transactions centers, or custodial centers, or home to funds whose equity is hard to value. But in some cases we are still working to understand the nature of the discrepancies. For instance, the emerging disconnect between holdings of Treasury securities and transactions in Treasury securities in the Cayman Islands may indicate “short sales” of Treasuries by entities in those regions, although we have no firm evidence that this is the case. In other cases, our data suggest that cross-border transactions are likely under-reported: we find that total holdings of U.S. corporate and foreign

bonds have increased by more than can be accounted for by transactions data and our estimates of valuation changes.

Although we provide a data set through December 2013, the timely availability of the TIC SLT allows for a new approach to estimating cross-border positions going forward. In real time, users can use SLT positions scaled by the ratio of the SLT to the most recent annual survey values, by country and security type. As a result, we generally recommend this approach rather than using the SLT values by themselves because the annual surveys are considered to be the best measures of holdings at a given point in time.³⁶ The ability to analyze the data at the security level allows for easier correction of misreporting or pricing errors, as well as for necessary adjustments to the data to account for potential double-counting of securities held, and these adjustments, though small in the aggregate, tend to be concentrated in particular securities types such as asset-backed securities and equity other than common stocks and in particular countries or regions such as the Caribbean financial centers.

We view our new estimates as a valuable complement to the existing TIC measures of transactions and holdings. The TIC S transactions data are an essential component to balance of payments measures of securities flows over time. When combined with changes in holdings as measured on the SLT, they also provide useful information for understanding when and how portfolio positions change in ways that are not accounted for by transactions: for example, they help us identify custodial shifts, and help highlight the importance of accurate measures of

³⁶ However, we support the use of the unadjusted SLT data for Treasuries in particular in uses such as publication in the Major Foreign Holders of U.S. Treasury Securities (MFH) table (<http://www.treasury.gov/ticdata/Publish/mfh.txt>) because, as noted above, the scaling ratios for Treasuries are very concentrated around one. Specifically, for the June 2013 reporting date, the ratios of SLT to SHL reporting at the country level were between 0.99 and 1.01 for countries accounting for 99% of the country-specific holdings shown in the MFH. Accordingly, we do not believe that such adjustments would materially affect or improve the accuracy of the figures shown.

valuation changes for equity holdings. Moreover, because the TIC S collects both gross purchases and gross sales of securities, it can provide monthly information on the gross volume of cross-border securities transactions, a measure cross-border financial activity that cannot be inferred from changes in monthly holdings. The annual surveys provide essential detail that allows for much richer analysis of cross border positions than would otherwise be available, including detailed information on the sector of issuer, currency of issue, and the maturity structure of holdings. But the more timely data based on the SLT indicate more movement in cross-border portfolios than available from the surveys alone: the SLT shows, for example, more variability in holdings of Italian and Spanish bonds over 2012 and 2013 than observable in year-end positions. We expect these new data to continue to provide valuable insights into investor behavior as U.S. cross-border portfolios continue to evolve.

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Appendix 1: The TIC Reporting System

Under the current Treasury International Capital (TIC) reporting system, an assortment of monthly and quarterly reports are filed with district Federal Reserve Banks by commercial banks, securities dealers, other financial institutions, and nonbanking enterprises in the United States. These data are centrally processed and maintained at the Federal Reserve Bank of New York, which, along with the district banks, acts as fiscal agent for the U.S. Treasury. Since late 1998, the Federal Reserve Board also has supported the TIC data collection system by providing final review and dissemination of TIC data to the Treasury as well as to other agencies, including the Bureau of Economic Analysis and the Bank for International Settlements. The TIC reports of individual respondents are treated as confidential and access to the respondent-level data is strictly limited to specific staff of the Treasury and the Federal Reserve System.

Data derived from Treasury reports are posted monthly on the TIC website, www.ustreas.gov/tic. TIC data aggregates are also published monthly at the Federal Reserve's website, www.federalreserve.gov/econresdata/releases/secholdtrans/current.htm, and are used in the U.S. international transactions and investment position compilations published by the Department of Commerce in the *Survey of Current Business*.

Report Forms

TIC BC (for U.S. claims) collects data on U.S.-resident financial institutions claims on foreigners, including deposit accounts, loans, and foreign short-term securities held by U.S. residents. Prior to December 2013, the TIC BC forms were filed by banks, other depository institutions, securities brokers and dealers, bank holding companies in the United States. Bank holding companies (BHCs) and financial holding companies (FHCs) also reported for their domestic nonbank and nonsecurities firm affiliates, other than their insurance affiliates, who

reported separately on the C-series forms. As of December 2013, all financial firms including those that had previously reported on the C forms are required to report on the TIC B forms. Data on respondents' own dollar claims are collected monthly on Form BC. Data on claims held for domestic customers as well as on claims denominated in foreign currencies is collected on a quarterly basis only on forms BQ-1 and BQ-2, respectively.

TIC BL forms (for U.S. liabilities) cover U.S.-resident banks' liabilities to foreigners, including deposits, U.S. short-term securities held by foreigners, and other liabilities. Prior to December 2013, the TIC BL forms were filed by banks, other depository institutions, and securities brokers and dealers in the United States. BHCs and FHCs also reported for all domestic nonbank, nonsecurities firm affiliates, other than their insurance affiliates, who reported separately on the C-series forms. As of December 2013, all financial firms including those that had previously reported on the C forms are required to report on the TIC B forms. Banks' own dollar-denominated liabilities are reported monthly on form BL-1, and customers' dollar-denominated liabilities are reported monthly on form BL-2. Liabilities denominated in foreign currencies are reported quarterly on form BQ-2.

TIC CQ forms collect quarterly data on the liabilities to, and claims on, unaffiliated foreigners of exporters, importers, industrial and commercial concerns, and other nonfinancial entities. Prior to December 2013, financial institutions other than banks, other depository institutions, and securities brokers and dealers also reported on the CQ forms. Financial claims and liabilities, such as deposits and short-term securities, are reported on the CQ-1. Commercial claims and liabilities, such as trade receivables and payables, are reported on the CQ2. Data exclude claims on foreigners held in custody by banks in the United States. As of December 2013, all non-bank financial firms that previously had filed the CQ forms are required to report

their positions on the TIC B forms, with most of these firms now reporting positions with both foreign affiliates and non-affiliates; insurance companies file the B forms but continue to report positions only with non-affiliates. Non-financial firms continue to report on the TIC CQ reports.

TIC D collects quarterly data on holdings and net cash settlements of cross-border derivatives contracts reported by banks, securities brokers, dealers, and nonfinancial companies in the United States with sizable holdings of derivatives contracts. Total holdings are divided between those contracts with positive fair values and those contracts with negative fair values from the perspective of the reporter. The fair (market) value is generally defined as the amount for which a derivative contract could be exchanged in a current transaction between willing parties, other than in a forced or liquidation sale.

TIC S collects monthly data on gross purchases and gross sales between U.S. residents and foreign residents in long-term domestic and foreign securities as reported by banks, securities brokers and dealers, and other financial intermediaries in the United States. A memorandum section reports the transactions in U.S. securities that represent purchases or sales by foreign official institutions.

TIC SHCA and SHC forms collect the annual and benchmark TIC survey data on U.S. holdings of foreign long- and short-term securities at the individual security level.

TIC SHLA and SHL forms collect the annual and benchmark TIC survey data on foreign residents' holdings of U.S. long- and short-term securities at the individual security level.

TIC SLT collects monthly data at the aggregate level on foreign holdings of U.S. long-term securities and on U.S. holdings of foreign long-term securities by broad security type.

Appendix Table 1: Summary of TIC reporting forms

TIC Form	Position/ flow	Item	Valuation method	Frequency	Reporter type	Magnitude** (Billions of U.S. dollars, as of last reporting date in 2013)
Banking						
BC : Report of US Dollar Claims on Foreigners	Position	Deposit accounts, loans, short-term securities, and other claims	Face	Monthly	U.S.-resident entities	2,674
BL-1 : Report of US Dollar Liabilities to Foreign Residents	Position	Deposits, short-term securities, and other own liabilities	Face	Monthly	U.S.-resident entities	3,622
BL-2 : Report of Customers' US Dollar Liabilities to Foreigners	Position	Short-term securities and other custody liabilities	Face	Monthly	U.S.-resident entities	1,030
BQ-1 : Report of Customers' US Dollar Claims on Foreigners	Position	Deposit accounts, short-term securities and other custody claims	Face	Quarterly	U.S.-resident entities	570
BQ-2 : Part 1 – Report of Foreign Currency Liabilities and Claims on Foreigners Part 2 – Report of Customers' Foreign Currency Liabilities to Foreigners	Position	Deposits, short-term securities, and other liabilities in foreign currency	Face	Quarterly	U.S.-resident entities	Part 1: 244 Part 2: 6
BQ-3 : Report of Maturities of Selected Liabilities to Foreigners	Position	Deposits, short-term securities, and other liabilities	Face	Quarterly	U.S.-resident entities	Not published*
CQ-1 : Report of Financial Liabilities to , and Financial Claims on, Unaffiliated Foreign-Residents	Position	Deposits, short-term securities, and other liabilities and claims	Face	Quarterly	U.S.-resident entities	36
CQ-2 : Report of Commercial Liabilities to, and Commercial Claims on, Unaffiliated Foreign-Residents	Position	Trade payables, advance receipts and other liabilities; trade receivables, advance payments and other claims	Face	Quarterly	U.S.-resident entities	107

Appendix Table 1: Summary of TIC reporting forms

TIC Form	Position/ flow	Item	Valuation method	Frequency	Reporter type	Magnitude** (Billions of U.S. dollars, as of last reporting date in 2013)
Securities						
D : Report of Holdings of, and Transactions in , Financial Derivatives Contracts	Position and net flows	Derivatives contracts	Fair value	Quarterly	U.S.-resident entities with derivatives contracts	Gross Pos. FV: 2,742 Gross Neg. FV: 2,815 Net Settlements: -3
S : Purchases and Sales of Long-Term Securities by Foreign-Residents	Flow	Long-term securities	Market	Monthly	Brokers and dealers, security underwriters, issuers of securities, end investors, managed funds	U.S. securities: For. purch.: \$2,019 For. sales: \$2,037 For. official purch: 83 For. official sales: 100 Foreign securities: U.S. purch.: \$588 U.S. sales: \$616
SHCA : Report of U.S. Ownership of Foreign Securities, Including Selected Money Market Instruments	Position	Long- and short-term securities	Market	Annual: December	Large custodial banks, broker-dealers, managed funds, end investors	7,576 (end-December 2012)
SHLA : Foreign-Residents' Holdings of U.S. Securities, Including Selected Money Market Instruments	Position	Long- and short-term securities	Market	Annual-June	Large custodial banks, broker-dealers, issuers, managed funds	13,531 (end-June 2013)
SLT : Aggregate Holdings of Long-Term Securities by U.S. and Foreign Residents	Position	Long-term securities	Market	Monthly	Large custodial banks, issuers, end investors, managed funds	Liabilities: 14,716 Claims: 8,895
<p>** Totals as of end-December 2013.</p> <p>* The BQ-3 data include maturity breakdowns used for supplemental calculations.</p> <p>Note: U.S.-resident entities include depository institutions, bank holding companies, financial holding companies, securities broker-dealers.</p>						

Figure 1: The U.S. Current Account and Net Cross-Border Securities Purchases (BOP terms), 1996 – 2013

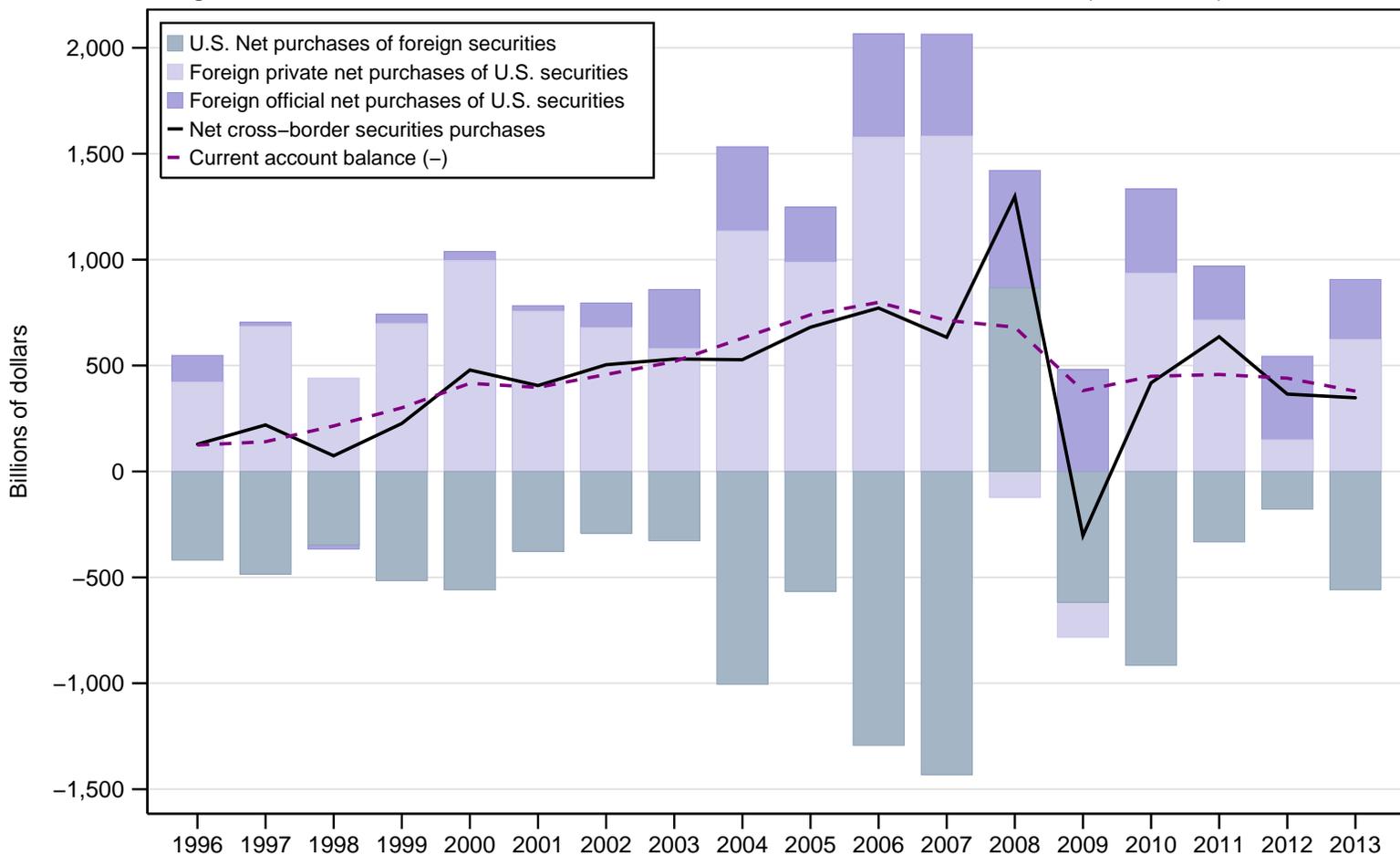


Figure 2: Changes in Holdings of Treasuries, 1996 – 2013

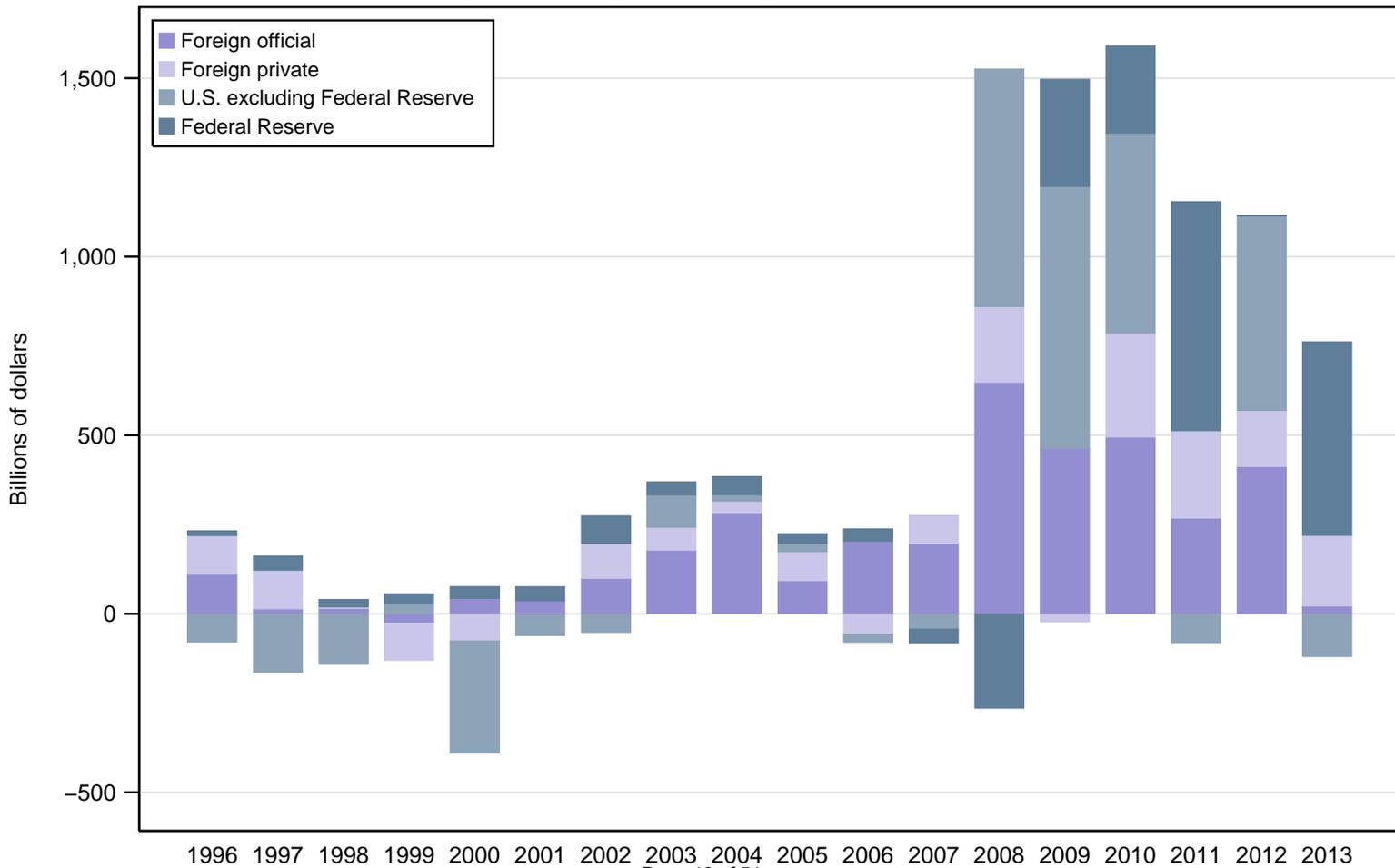


Figure 3: Survey and S-Based Position Estimates for Treasuries Held by United Kingdom

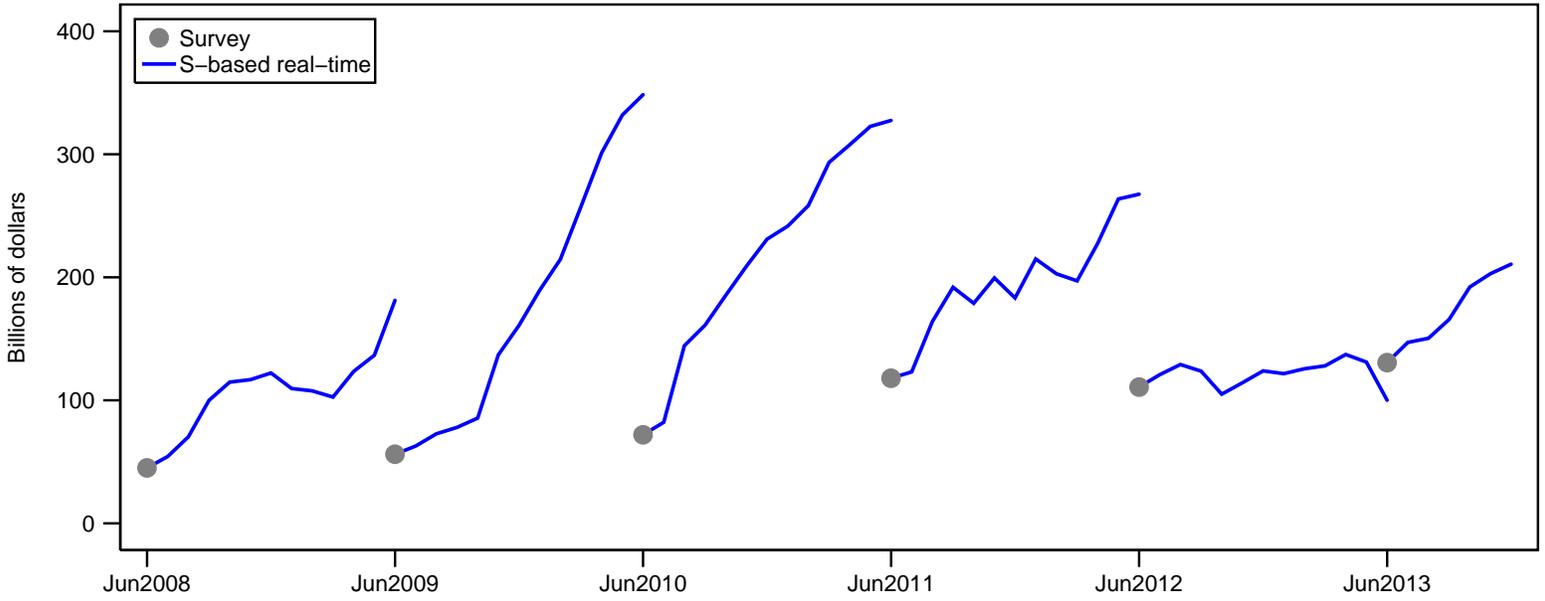


Figure 4: Survey and S-Based Position Estimates for Treasuries Held by Russia

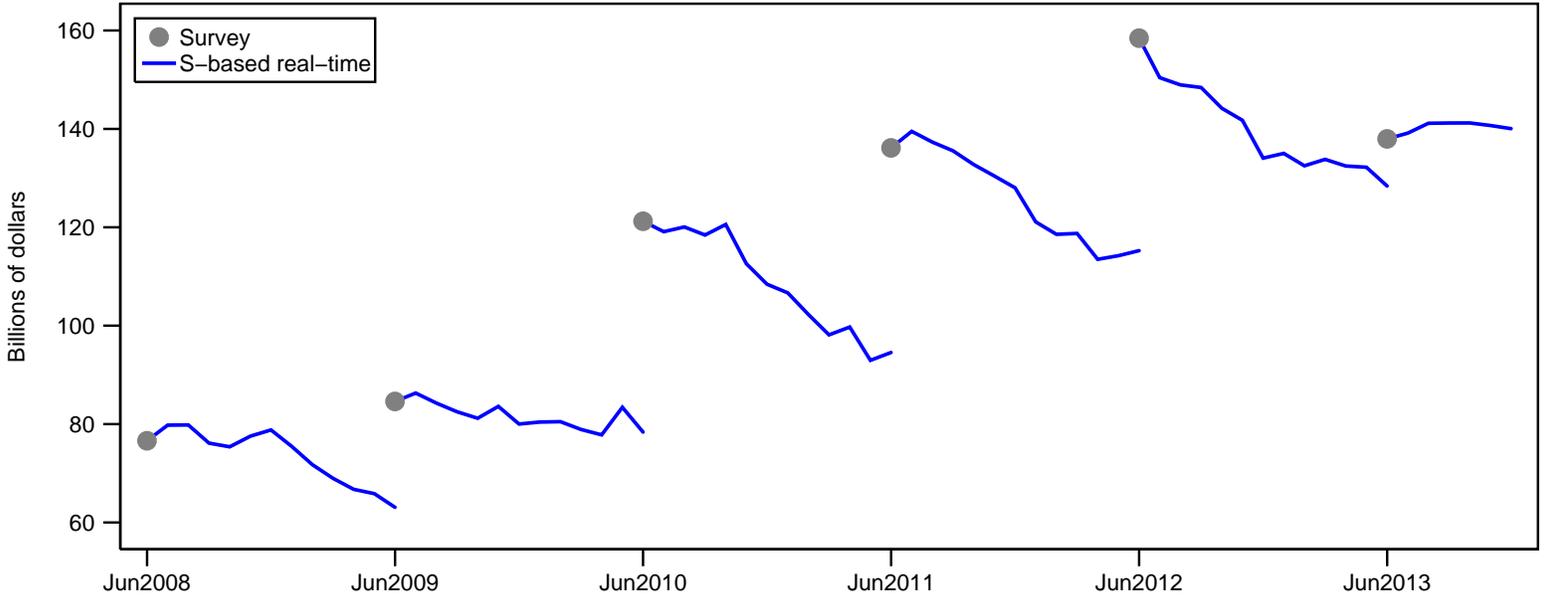


Figure 5: Survey and S-Based Position Estimates for All Foreign Bonds

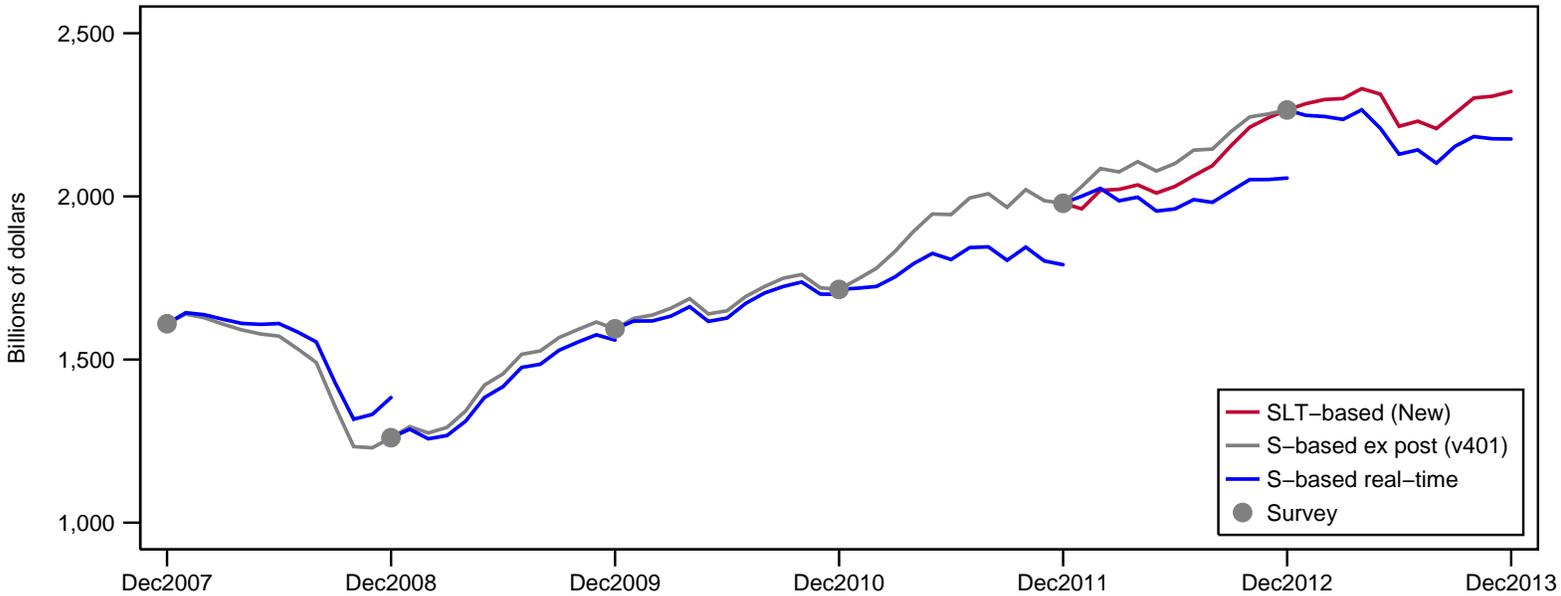


Figure 6: Components of SLT Changes for Foreign Bonds, 2012–2013 Average

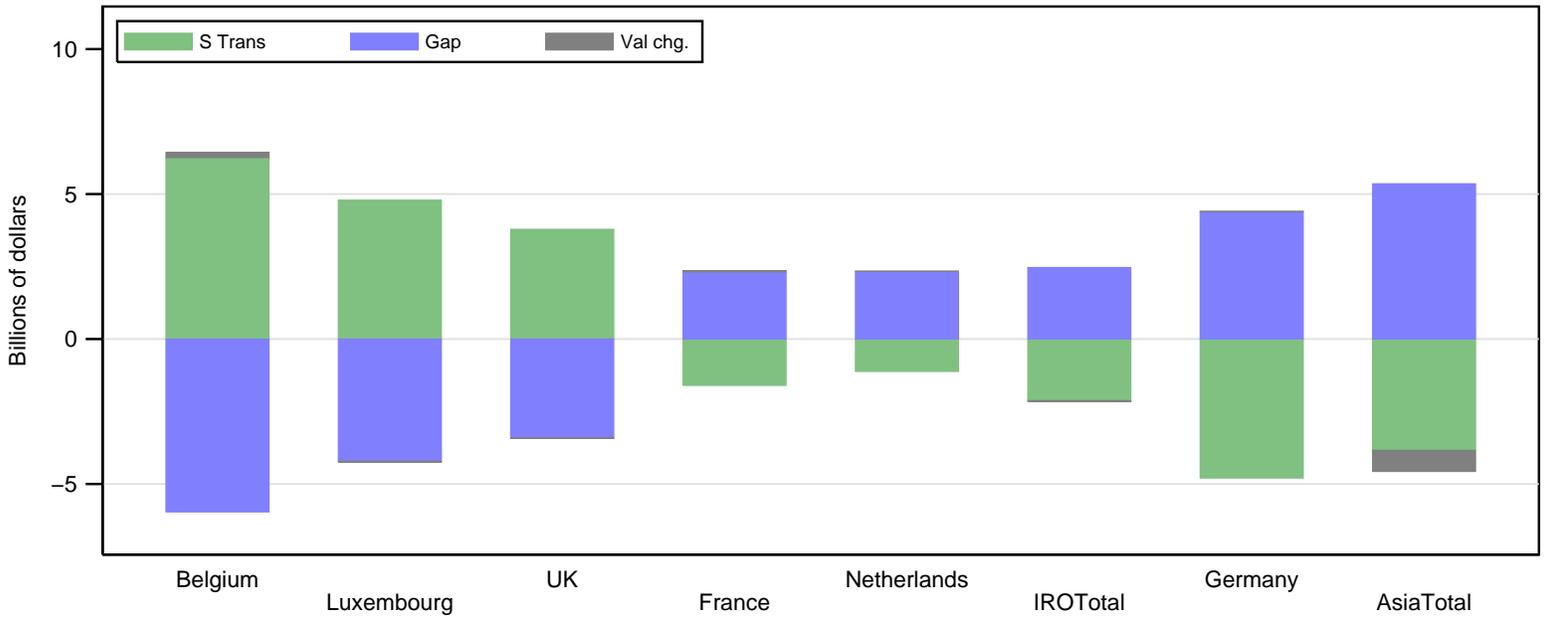


Figure 7: Components of SLT Changes for Total Equity

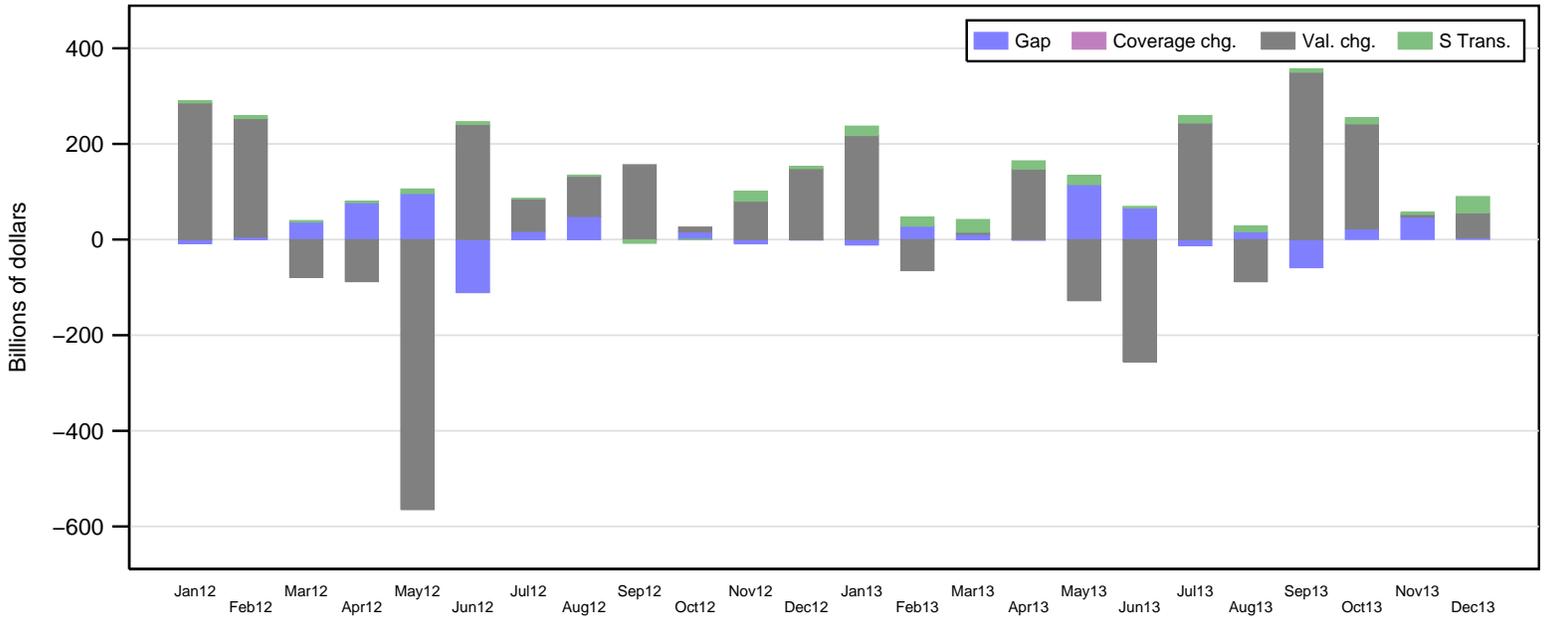
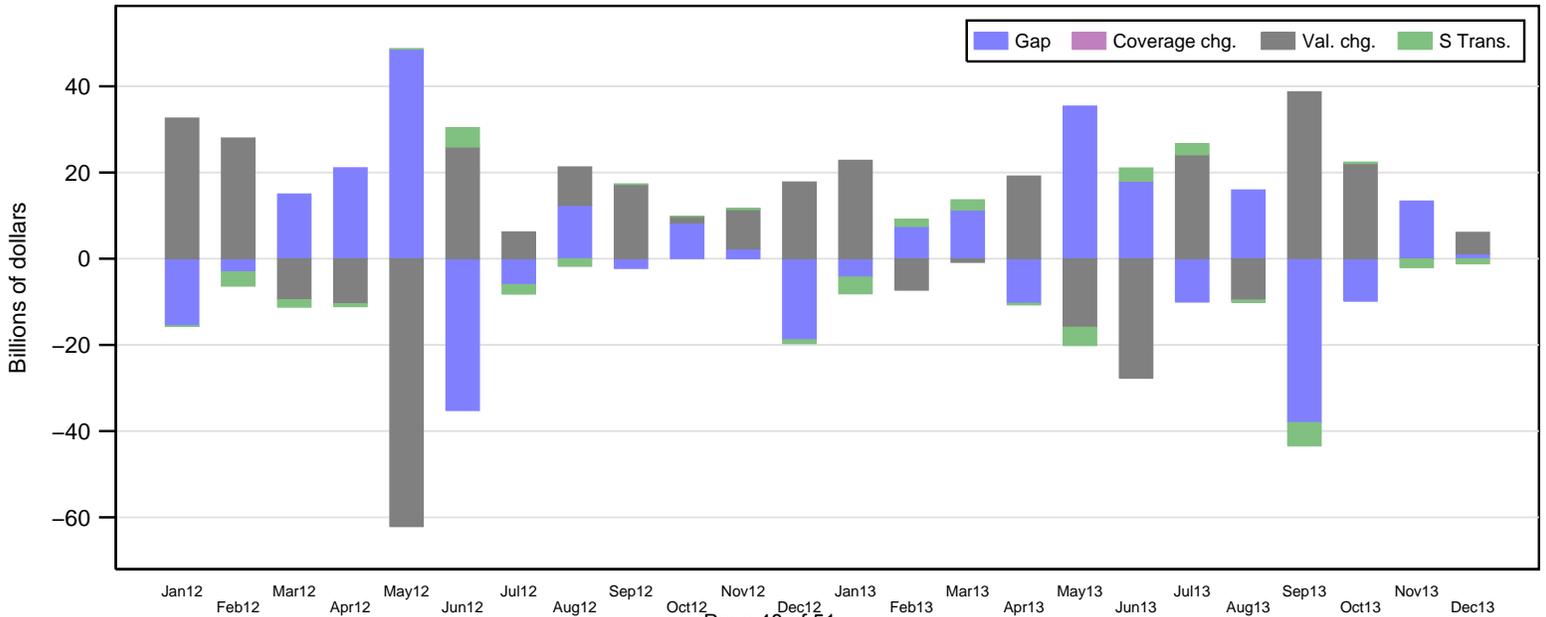


Figure 8: Components of SLT Changes for Cayman Islands Equity



Estimates of Positions and Changes of Foreign Holdings of U.S. Treasuries

Figure 9A: U.K. Positions

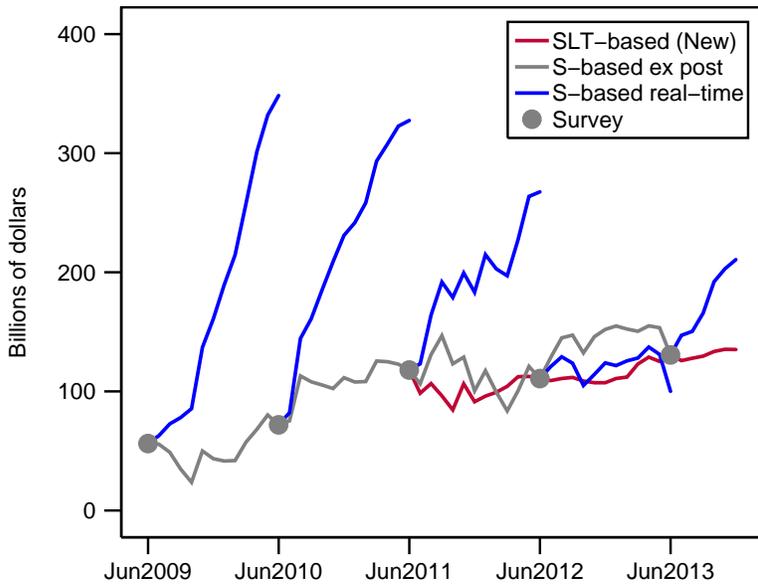


Figure 9B: U.K. Changes

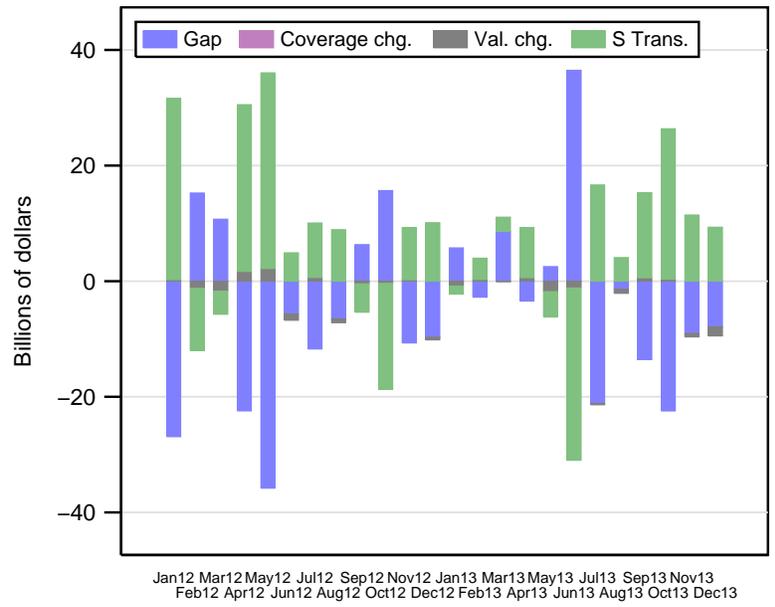


Figure 10A: Belgium Positions

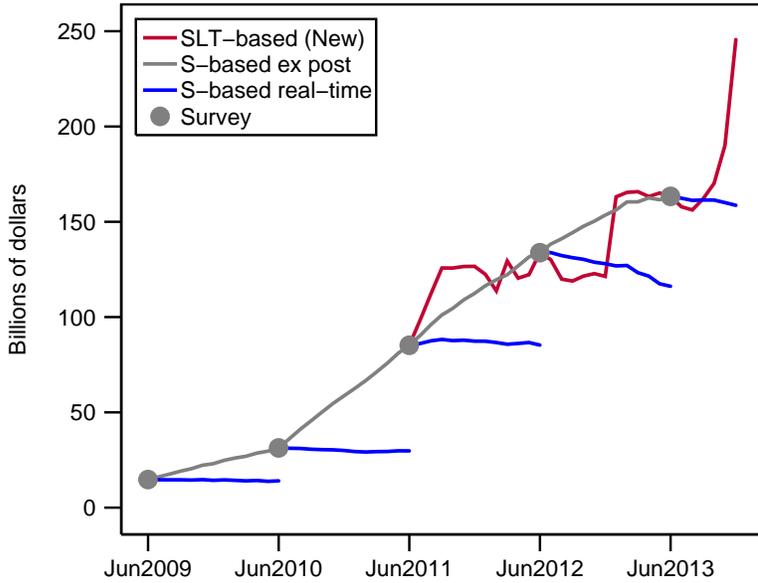
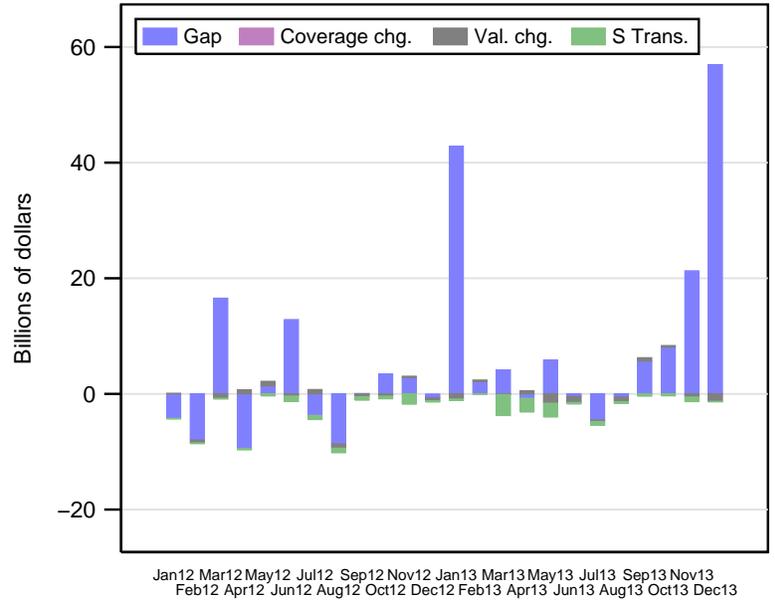


Figure 10B: Belgium Changes



Estimates of Positions and Changes of Foreign Holdings of U.S. Treasuries

Figure 11A: Cayman Positions

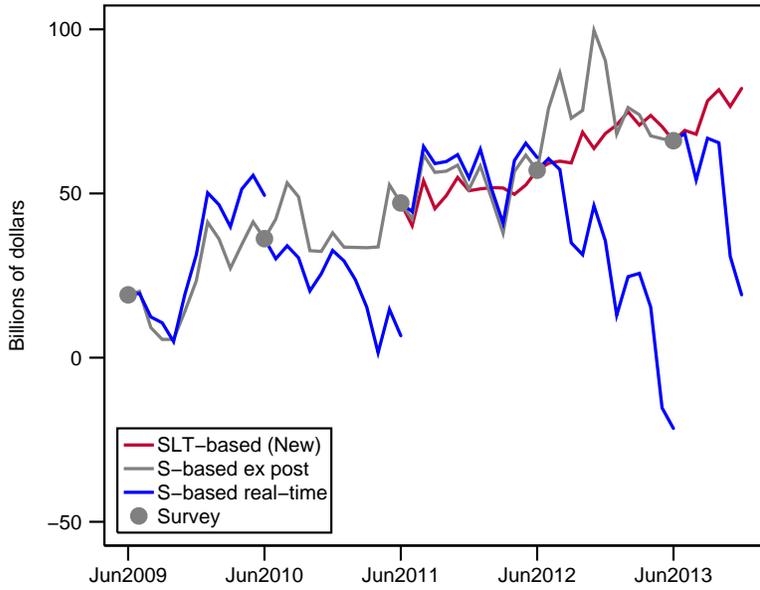


Figure 11B: Cayman Changes

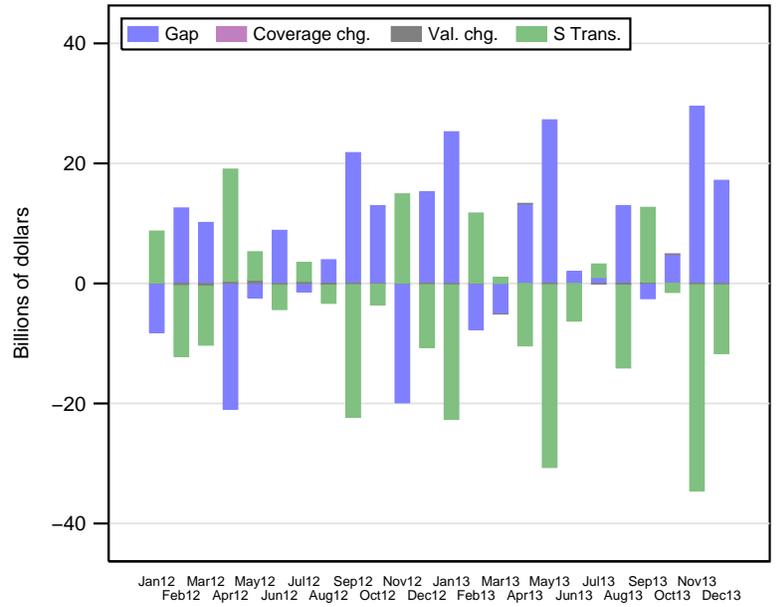


Figure 12A: China Positions

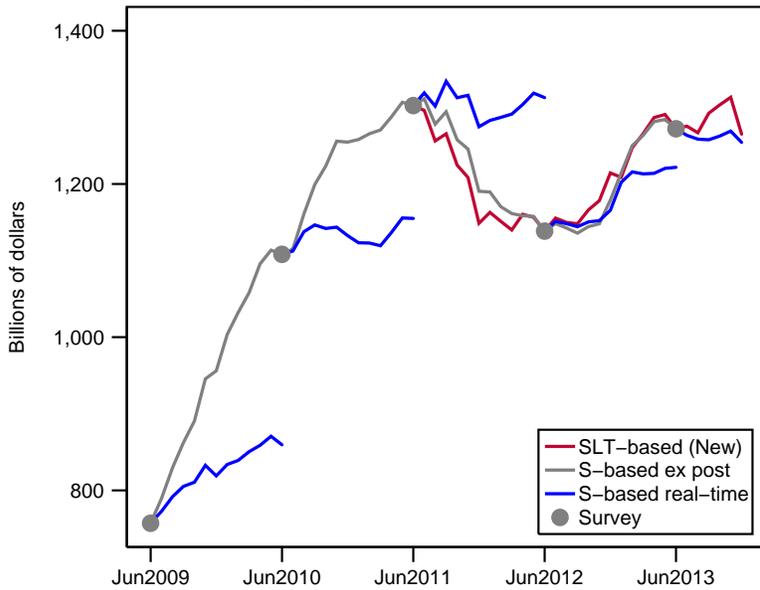


Figure 12B: China Changes

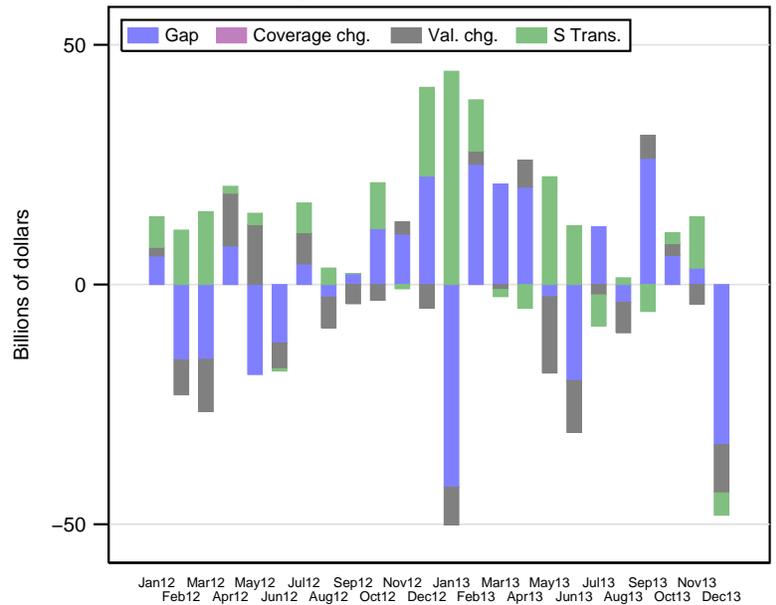


Figure 13A: Foreign Official Positions

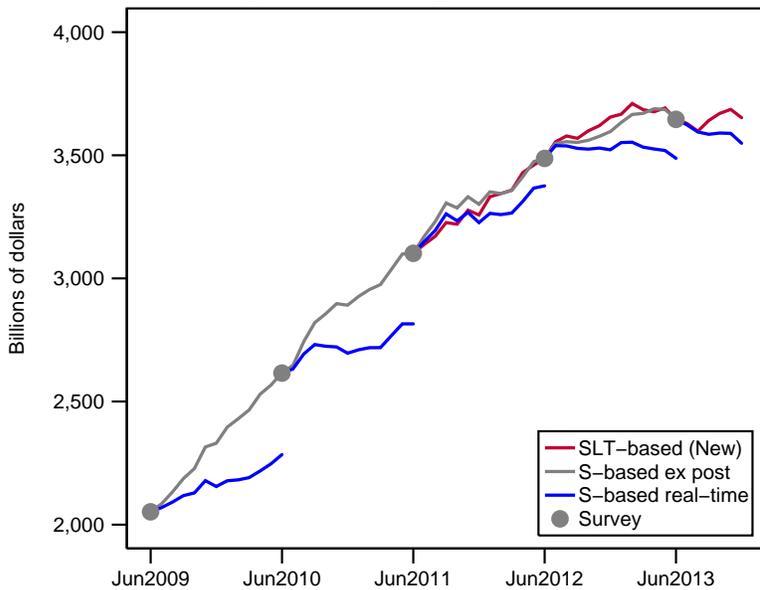
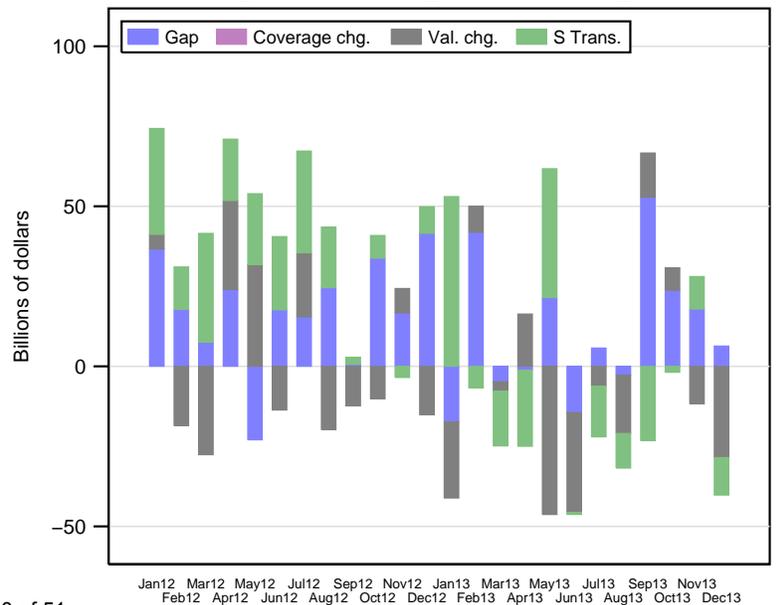


Figure 13B: Foreign Official Changes



Estimates of Positions and Changes of U.S. Holdings of Foreign Bonds

Figure 14A: Positions, Italian Bonds

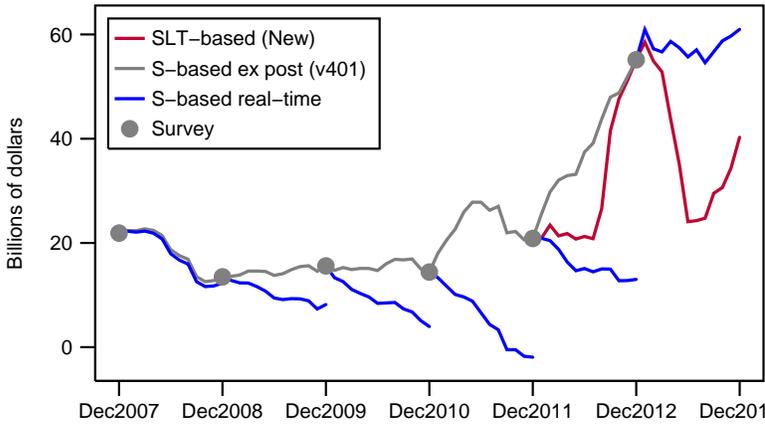


Figure 14B: Changes, Italian Bonds

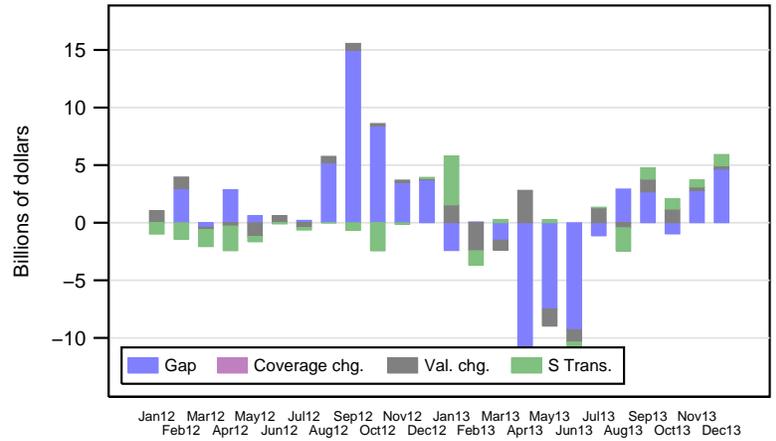


Figure 15A: Positions, Spanish Bonds

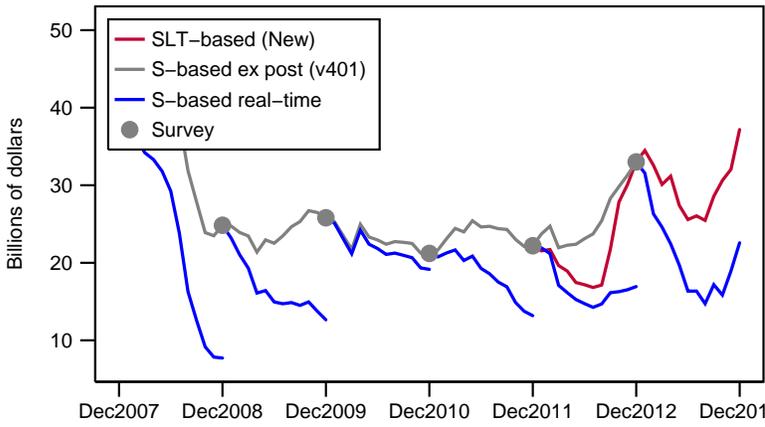


Figure 15B: Changes, Spanish Bonds

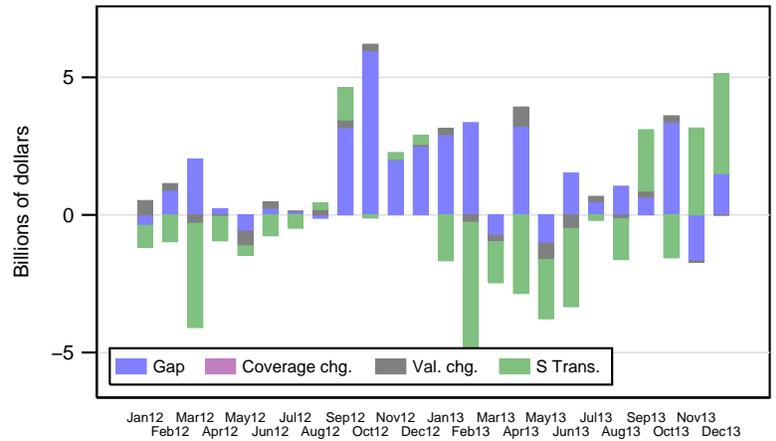


Figure 16A: Positions, EME Bonds

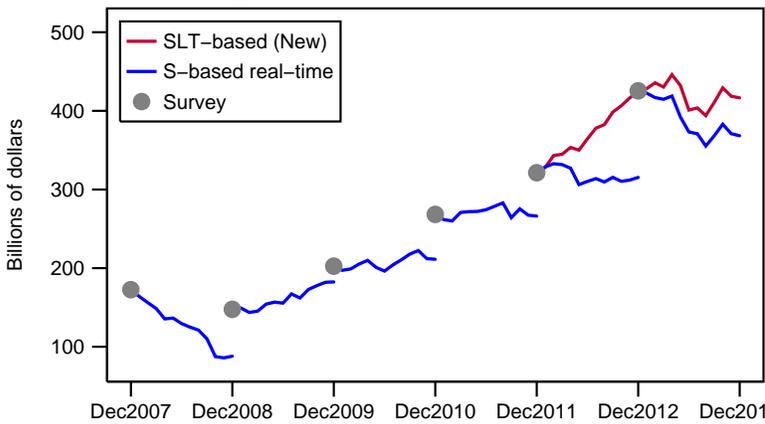


Figure 16B: Changes, EME Bonds

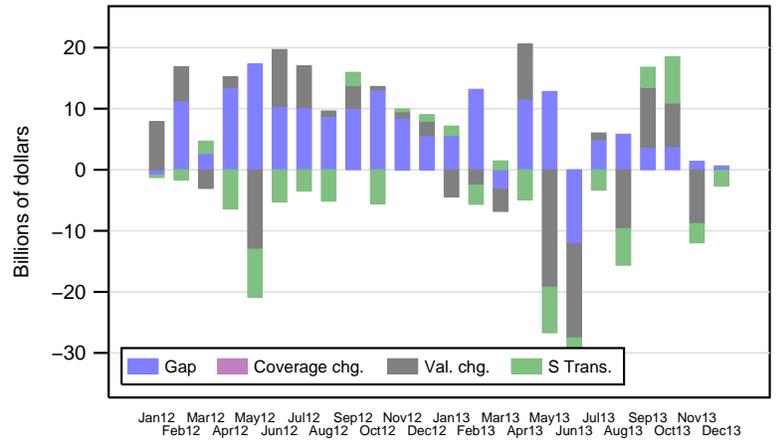


Figure 16C: Estimated Flows, EME Bonds
S transactions + Gap, or SLT change - Val. chg.

