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Document de Travail Working Paper 2014-23

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monetary policy after the subprime crisis

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Net flows to emerging markets' funds and the U.S. monetary policy after the subprime crisis

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April 9, 2014

Abstract

In this paper, we examine the determinants of global investors' net flows to investment bond funds dedicated to emerging economies and analyze the effects of the U.S. expansionary monetary policy on these flows from 2010 to 2013. We particularly focus on investors' behavior *vis-à-vis* emerging markets local and foreign currency bond funds. Our main findings confirm the significant external impact of U.S. monetary policy decisions – and especially tapering announcements – on net flows to foreign currency bond funds. Our results highlight the higher sensitivity of EMEs foreign currency bond markets to U.S monetary shocks and suggest possible transmission effects from developed to emerging bond markets.

JEL Classification: E44, G23, F32

Keywords: Emerging market economies, capital flows, bond markets, shocks transmission, institutional investors, unconventional U.S. monetary policy.

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1 Introduction

Since the early 1990s, financial crises in emerging market economies (EMEs) have fueled debates on the costs and benefits of capital flows.¹ Capital flows to emerging countries have had erratic behaviors reflecting both domestic macroeconomic changes and global external shocks. The successive financial crises witnessed in Latin America and Asia fostered the emergence of an important strand of the economic literature on the determinants of abrupt capital flows reversals on emerging markets.

The role of global external factors and especially crisis transmission phenomena from developed to emerging countries in the 1990s – evidenced by the economic literature at the time² – has been particularly highlighted in recent studies on the back of the subprime and sovereign debt crises. Among them, Chudik & Fratzscher (2012) highlight shocks transmission to EMEs during the subprime and the sovereign debt crises, illustrated by large capital outflows in 2007-08 and soaring capital inflows in 2010-11, while Fratzscher et al. (2013) and Lim et al. (2014) focus on the spillover effects of the US credit easing on capital flows movements following the crisis and stress the pro-cyclical effects of the U.S. unconventional monetary policy on capital flows on EMEs and developing countries.³

Another strand of the literature has been focusing on global external shocks to EMEs through the investment funds channel. Jotikasthira et al. (2012) show that funding shocks experienced by global funds tend to alter their portfolio flows towards EMEs. The authors particularly highlight the contagion effects from developed to emerging markets, following a funding drop in global investment funds and its impact on capital flows towards EMEs these funds are investing in. In line with Jotikasthira et al. (2012), Raddatz & Schmukler (2012) show that mutual funds are an important channel of crises transmission to EMEs as investors, in response to global market tensions, tend to pull out of investments funds, bringing about massive withdrawal of capital from emerging markets.

More recently, Puy (2013) also confirms evidence of global contagion through in-

¹See Calvo et al. (1994a), Calvo et al. (1994b), Calvo et al. (1996), Arteta et al. (2001) and Bekaert et al. (2004).

²See Broner & Rigobon (2005), Calvo & Talvi (2005) and Izquierdo et al. (2008).

³See also Canova (2012) for shock transmission to Latin American Countries, Arora & Cerisola (2001), Byrne & Fiess (2011), Gauvin et al. (2013) and Moore et al. (2013) on the determinants of US monetary policy and policy uncertainty on EMEs sovereign bond spreads and flows.

stitutional funds and show that emerging markets particularly suffered from the funding shocks observed during the subprime crisis. Since the early 2000s, investment funds have been a growing actor on global financial markets on the back of a boom in capital flows movements and a continued liberalization of EMEs capital accounts. However, in light of abrupt capital flows movements observed during the recent crises, the stabilizing role of these funds on EMEs financial markets has been questioned by the recent empirical literature.⁴

In our paper, we investigate the spillover effects of US monetary decisions on investors' contributions to EMEs dedicated-funds from 2010 to 2013. Contrary to previous studies – such as [Raddatz & Schmukler \(2012\)](#) or [Puy \(2013\)](#) – which analyze investors' contributions to global equity and bond funds, our study focuses on net contributions to investment bond funds specialized on emerging markets, as EMEs bond markets appear as being more prone to abrupt capital movements than equity markets.⁵

In this respect, analyzing net flows to emerging markets bond funds should permit to better capture investors' reactions to U.S. monetary decisions, EMEs bond markets attractiveness and changes in global market aversion. We furthermore operate a distinction between funds dedicated to local currency bond (LCB) and foreign currency bond (FCB) markets. Making such a distinction is decisive for a better understanding of EMEs bond markets as we expect the degree of sensitivity to global shocks to vary among investors' contributing to LCB and FCB funds.

The rest of the paper is organized as follows. Section 2 briefly reviews the literature on capital flows to the EMEs in the 1990s and presents some stylized facts on investors' net flows to EMEs bond funds during and after the subprime crisis. This section particularly explores the shifts in investors' behavior *vis-à-vis* EMEs bond funds from 2007 to 2014 and emphasizes changes in net flows observed after the Fed tapering announcement in May 2013. Section 3 presents the data and the methodology. We then analyze the interactions between the US monetary policy decisions, EMEs bond benchmarks and investors' flows from 2010 to 2014, in section 4. Section 5 concludes the paper.

⁴See [Ong & Sy \(2004\)](#) and [Raddatz & Schmukler \(2012\)](#).

⁵See the literature review below in section 2.

2 Stylized facts

2.1 Flows to EMEs in the 1990s and 2000s

Foreign currency debt issuances significantly rose in the early 1990s following a wave of capital account liberalization in the emerging markets. With this new access to global debt markets, EMEs benefited from massive capital inflows from developed countries both in foreign direct and portfolio investments.⁶ EMEs attractiveness for global investors primarily resulted from high opportunity cost for investors given low U.S. Treasury yields, falling U.S. rates triggering at the time search-for-yield behaviors of investors.⁷

Fears concerning abrupt reversals in capital flows movements from EMEs to advanced economies (AEs) highlighted by the economic literature⁸ did not prevent the dramatic capital outflows witnessed in Latin America and Asia, on the back of a rise in U.S. rates and the deterioration of investors confidence *vis-à-vis* emerging markets in the 1990s. Latin American and Asian crises prompted indeed a deep reconsideration of theories promoting capital flows liberalization and seriously questioned the beneficial effects of free capital flows movements for emerging markets praised by the Washington Consensus.⁹ [Eichengreen et al. \(2003\)](#) particularly highlight the EMEs' heavily dependence to foreign currency debt on government and bank balance sheet and furthermore stress the dramatic impact of resulting currency mismatches in the aggravation of the financial crisis in Latin America and Asia.¹⁰

Since the beginning of the 2000s, the development of local currency debt markets has contributed to significantly reduce EMEs vulnerability to large currency depreciation and currency mismatches. Local currency debt markets, through better financing diversification¹¹ and a significant reduction of capital flows volatility

⁶Most of debt financing was done through bank lending prior to the 1990s. See [Kaminsky \(2006\)](#).

⁷The impact of U.S. shocks on EMEs capital flows has been thoroughly analyzed by the literature particularly by [Calvo et al. \(1993\)](#), [Calvo et al. \(1994a\)](#) and [Calvo & Reinhart \(2003\)](#).

⁸See particularly [Calvo et al. \(1993\)](#).

⁹See [Bergsten & Henning \(2009\)](#) and [Arteta et al. \(2001\)](#) on the limits of capital account liberalization.

¹⁰The authors put in perspective currency mismatches with debt intolerance and "original sin" phenomena observed during the 1990s crises. While the debt-intolerance concept tackles EMEs institutional weaknesses, the original-sin rather evokes EMEs difficulties to denominate their debt in local currency. For the literature on currency mismatches during the crisis, see [Reinhart et al. \(2003\)](#), and [Eichengreen & Hausmann \(1999\)](#).

¹¹Reducing dependency to bank finance particularly in Asia, see [Eichengreen & Luengnaruen-](#)

have contributed to mitigate risks of capital flows reversals in EMEs.¹² The development of local currency debt markets was furthermore encouraged by better macroeconomic policies in EMEs and favorable global economic prospects, and fueled by global investors capital flows seeking for diversification and higher returns in a backdrop of expansionary monetary stance in AEs.

Although local currency debt markets have been gaining momentum along the last decade, strong disparities subsist among emerging markets raising the question of the actual degree of sensitivity of emerging countries as whole to abrupt capital flows reversals. Capital flows reversals and institutions reliability issues have been explored by the empirical literature.¹³ These studies although highlighting the role of institutions in mitigating abrupt movements in debt capital flows, do not distinguish between local and foreign currency debt flows. However, this distinction is particularly important in the extent that it allows us to gauge the effects of foreign and local currency bond markets respectively *vis-à-vis* external shocks and provides a better overview of risks boreed by LCB and FCB markets in EMEs. Distinguishing between LCB and FCB markets in the analysis of investors' net flows furthermore throw light on transmission channels through EMEs debt-market following global external shocks.

Indeed, the coincidence of a surge in capital flows to EMEs and the U.S. ten-year rate decrease following the subprime crisis stands out by its similarity to events witnessed preceding the EMEs 1990s crises, Latin American and Asian crisis out-breaking following huge amount capital inflows partly triggered by low U.S. interest rates. At the time, too heavy reliance of EMEs to foreign currency debt appeared at the time as the primary source of vulnerabilities of emerging countries. Analyzing the relative sensitivity of local and currency bond markets to recent U.S. monetary policy decisions is decisive to better apprehend shocks transmission channels from AEs to EMEs.

mitchai (2004).

¹²See Burger & Warnock (2006) and BIS (2007).

¹³See Tovar (2005), Burger & Warnock (2006), BIS (2009), Burger & Warnock (2010), Essers & Cassimon (2012), Fratzscher (2012) and Miyajima et al. (2012) .

2.2 Investors' net flows to EMEs funds since the subprime crisis

Investors' net flows¹⁴ to bond funds from 2007 to 2013, extracted from the Emerging Portfolio Funds Research (EPFR) Global database, differ significantly between developed and emerging markets (see Figure 1). Indeed, during both crisis and post-crisis period – the crisis period going from August 2007 to July 2009 and post crisis period from August 2009 to May 2013¹⁵ –, net flows levels to advanced economies funds appear significantly outweighed by net flows to emerging markets funds, the latter witnessing massive redemptions during the crisis and important levels of contributions on average during the post-crisis period.

Similarly, EMEs funds also witnessed much stronger redemptions during the tapering period while the level of redemption in advanced economies funds remained modest on average. Changes in investors' behavior during these periods and the strong shifts observed in net flows are in line with the high volatility level usually observed on capital flows movements towards emerging markets.¹⁶ The drop in net flows during the tapering period appears furthermore particularly striking, investors' redemptions from EMEs funds rising in a period of relatively low global market tensions contrary to the crisis period.

When giving a closer look to investors' net flows to EMEs bond funds, it seems that investors make a clear distinction between LCB and FCB funds (see Figure 2). After a slight drop both in FCB and LCB funds during the crisis period, the surge in contributions observed during the post-crisis periods appears indeed much more significant in LCB funds than in FCB funds in all emerging markets – except emerging Europe.¹⁷ Again, the tapering period – going from May 2013 to December 2013 – shows a massive drop in net flows to EMEs funds as a whole, this drop being particularly much more concentrated on FCB funds than on LCB

¹⁴Net flows are expressed in percentage of assets under management (AUM) and can also be designated as the percentage of bond assets held by these funds in bond funds in developed and emerging markets. Changes in the % of AUM then reflect investors behavior towards developed and emerging markets, an increase (decrease) in the % AUM corresponding to a increase (decrease) of capital flows in bond funds invested in the area.

¹⁵Crisis dating broadly differs from a study to another. While Fratzscher (2012) suggests August 2007 to March 2009, we rather rely on Chudik & Fratzscher (2012) with a sample going from August 2007 to July 2009, as the differences between data sample do not impact the stylized facts observed in this section.

¹⁶See particularly Ostry et al. (2010) and Forbes & Warnock (2012) on debt flows volatility.

¹⁷While we observe a change in net flows to LCB and FCB funds during the different periods considered, emerging Europe funds, contrary to other emerging area, witness redemptions from investors flows lingering through the whole sample, investors probably focusing rather on funds geographically diversified and offering better yield perspectives.

funds on average. Investors' distinction between emerging LCB and FCB funds – i.e. emerging LCB and FCB markets – is not new and has been, as shown above, particularly explored by the empirical literature.

Similarly to the early 1990s, the post-crisis period (see Figure 2) stands out by the occurrence of both large capital inflows to EMEs and low U.S. interest rates. The impact of the U.S. monetary policy and decisions on global capital flows movements during this period has recently been explored by several empirical studies, such as [Ahmed & Zlate \(2013\)](#), [Fratzscher et al. \(2013\)](#), [Moore et al. \(2013\)](#) and [Lim et al. \(2014\)](#). [Fratzscher et al. \(2013\)](#) particularly emphasize the impact of the Fed non-standard policy tools¹⁸ on the re-balancing of bond portfolio flows from the U.S. to EMEs bond markets from 2010 onwards. The authors furthermore highlight the role played by the U.S. monetary policy decisions and particularly the implementation of the second phase of the U.S. quantitative easing on capital flows towards EMEs. As in the 1990s, interest rate differentials between AEs and EMEs and global risk appetite contributed to a surge in EMEs portfolio flows,¹⁹ raising the question of possible massive reversal in case of shift in the U.S. monetary policy stance.

Fears of massive outflows from EMEs emerged for the first time following Fed Chairman, Ben Bernanke announcement of a possible tapering of LSAP purchases in May 2013.²⁰ Investors strong reaction to this announcement is particularly striking. Net flows to EMEs funds dropped back significantly during the "tapering period"²¹ (see Figure 1), illustrating strong capital flows reversals from EMEs to AEs in anticipation of a shift in the Fed monetary policy stance. Additionally, mean net flows to EMEs funds (see Figures 2 and 3) suggest that investors redemptions on average from FCB funds were much more significant than redemptions from LCB

¹⁸The US Federal Reserve non-standard tools decisions following the subprime crisis primarily consisted in the implementation of quantitative easing policies, which included in their first stage in 2008 liquidity operations to support banks and markets, and large-scale asset purchases (LSAP) of agency debt, Government-Sponsored-Enterprises (GSE) debt, Treasury and Mortgage-Backed Securities.

¹⁹Contrary to [Fratzscher et al. \(2013\)](#), [Ahmed & Zlate \(2013\)](#) do not find statistically significant positive effects of unconventional U.S. monetary decisions on total net EMEs inflows. [Ahmed & Zlate \(2013\)](#) results rely on quarterly balance-of-payments data from 2002 to 2012, probably making U.S. policy tools spillover more difficult to capture as in [Fratzscher et al. \(2013\)](#), whose studies cover weekly data from 2008 to 2011.

²⁰See Ben Bernanke Testimony:

<http://www.Federalreserve.gov/newsevents/testimony/bernanke20130522a.htm>

²¹The "tapering period" corresponds to the last grey period on all our figures, namely May 2013 to December 2013.

funds during the tapering. The accrued aversion of global investors *vis-à-vis* FCB markets remind the massive capital flights observed in the 1990s, and probably herald massive outflows from EMEs, in case of tightening of the U.S. monetary policy.

Thanks to the development of LCB markets and the implementation of strong, better current account balances and stronger financial institutions, EMEs bond markets have witnessed massive capital inflows over the last 15 years.²² In this respect, the outbreak of financial crises in EMEs similar in scale to those observed in the 1990s is unlikely. LCB markets development however differs significantly among emerging markets and FCB markets that are still dominating in some area such as Latin America. Analyzing investors sensitivity to recent Fed announcements and monetary policy decisions would provide a better understanding of capital flows movements to the EMEs.

3 Data and methodology

3.1 Data

To illustrate global investors' behavior *vis-à-vis* global bond markets during and after the recent crises, we rely on the EPFR Global database. EPFR Global publishes data on flows for more than 8000 bond funds around the world and captures about 5% to 20% of market capitalization in bonds for most countries. These are quite representative as they mostly match portfolio flows data stemming from the total balance of payments.²³ Our dataset consists in net flows to mutual funds dedicated to global emerging, Asian, Latin American and emerging Europe foreign and local currency-denominated bond markets in percentage of asset under management (AUM). We rely on weekly data published by EPFR Global.²⁴

We also use J.P. Morgan bond indices for each emerging market : *i*) the J.P.Morgan consisting in the emerging market bond index Plus (EMBI+) covering U.S. dollar-denominated debt instruments in emerging markets, and *ii*) the global bond index - emerging markets (GBI-EM) tracking local currency bonds issued by Emerging Markets. Several versions of the EMBI and of the GBI-EM indices exist, such as

²²See Miyajima et al. (2012).

²³See Fratzscher (2012) and Jotikasthira et al. (2012).

²⁴As for net flows, all data presented below are weekly averages as of Wednesday.

the EMBI Global or the GBI-EM Broad. The EMBI+ and the GBI-EM are the most restrictive versions of both indices, which encompass less countries, include most accessible markets to foreign investors, both indices also being the most liquid and followed EMEs benchmark bond indices on financial markets (see Figure4a and 4b).

When analyzing net flows to FCB funds, we rely on EMBI+ spreads versus the U.S. ten-year yield, the difference between both variables permitting to gauge investors' risk premia in our selected bond markets. The EMBI+ index has been used for long as a proxy of emerging markets default risk. Recent studies – such as [Ozatay et al. \(2007\)](#), [Bellas et al. \(2010\)](#) and [Foley-Fisher & Guimaraes \(2012\)](#) – also highlight the role of global external factors as determinants of the benchmark index dynamic. Among them, [Ozatay et al. \(2007\)](#) particularly underline the impact of U.S. macroeconomic news and Fed monetary policy decisions on the evolution of EMBI spreads. We use the GBI-EM index, i.e. the J.P. Morgan benchmark for emerging markets local currency-denominated bond index, to carry out the same analysis for net flows to EMEs LCB funds.

The difference between EMBI+ and GBI-EM relies particularly on the currency denomination of bonds underlying these benchmarks and the degree of attractiveness they both involve for investors. Conversely to the EMBI+, the GBI-EM is not a currency risk-free benchmark. Rising GBI-EM returns primarily reflect an increase in local currency bonds attractiveness, stemming from improved macroeconomic prospects in EMEs relative to AEs following the subprime crisis. Furthermore, the appreciation of local currencies has also contributed to reduce currency risks, currency appreciation witnessed in emerging markets appearing as a potential source of returns on LCB, given rising productivity, growth levels and subsequent improved terms of trade for EMEs relative to AEs (see Figure 4d).

Following the drop in the U.S. ten-year benchmark and the subsequent increase in interest rate differentials, we also focus on the "tapering announcement" in May 2013. Several studies – such as [Fratzscher et al. \(2013\)](#) and [Lim et al. \(2014\)](#) – have been exploring the spillover effects of Fed's unconventional monetary policy tools on capital flow movements towards emerging markets. Fed's successive quantitative easing announcements and large scale asset purchases (LSAP) have significantly contributed to the recent increase in capital flows towards emerging markets. However no studies have analyzed the particular effects of the tapering announcement on investors' net contributions to EMEs funds as we do in the

present paper. We rely on the CBOE volatility index (VIX) to gauge the effects of global risk aversion on investors' behavior *vis-à-vis* emerging markets. All these data are extracted from Datastream.

3.2 Methodology

We focus on the impact of the expansionary U.S. monetary policy on investors net flows towards EMEs funds, illustrated by the long drop observed from 2010 in the U.S. ten-year yield. In this respect, we estimate the following equation restricting our analysis to the 03/03/2010 to 12/02/2014 period:²⁵

$$y_{it}^k = \alpha_0 + \beta_1 y_{it-1}^k + \beta_2 Spread_{it}^k + \beta_4 VIX_t + \beta_5 TD_t + \varepsilon_t, \quad (1)$$

with $i = 1, \dots, 4$, standing for funds investments area – i.e. Global Emerging Markets, Asia, Latin America and emerging Europe respectively – and $k = 1, 2$, corresponding to the type of bond funds – i.e. local and foreign currency bond funds respectively. y_{it}^k is the measure of investors' net flows to EMEs funds. $Spread_{it}^k$ corresponds to the J.P.Morgan spreads – i.e. the J.P. Morgan GBI-EM for $k = 1$ and to the EMBI+ spread versus the ten-year U.S. yield for $k = 2$.²⁶ We furthermore include one lag of the dependent variable to account for persistence in capital flows and the CBOE volatility index (VIX). The global market aversion is used in this model as a control variable in the extent that it allows us to capture significant changes in net flows reflecting investors' risk aversion and not specifically related to EMEs bond markets risk premia or to U.S. monetary policy decisions. TD_t is the tapering dummy defined as follows:

$$TD_t = \begin{cases} 1 & \text{for the tapering period} \\ 0 & \text{for the rest of the time} \end{cases}$$

Our dummy variable goes from the first announcement of the tapering in May 22, 2013 to the last Fed release of a tapering road map on December, 18 2013. ε_t is an *iid* error term.

In the context of US expansionary monetary policy, the drop in the U.S. ten-

²⁵Only local and foreign portfolio net flows variables are stationary. All other variables are used in first difference in the OLS estimation below.

²⁶We use the J.P. Morgan EMBI+ spread to the ten-year U.S. yield the J.P. Morgan benchmark being also denominated in dollars. However we use the J.P.Morgan GBI-EM index alone, the latter being denominated in local currency.

year yield and the resulting increase in yield differentials between EMEs and U.S. benchmarks have fueled global investors' search-for-yield from 2010. On a backdrop of low U.S. Treasury yields, rising EMBI+ and GBI-EM indices as a whole probably contributed to EMEs bond markets attractiveness.²⁷ We expect a positive relationship between net flows to EMEs funds and the J.P.Morgan benchmark indices over the period, flows towards EMEs funds increasing given rising bond benchmark spreads and an ongoing decrease in U.S. long-term yields.

The first hint of an upcoming tapering of the LSAP was evoked by Fed chairman, Ben Bernanke on May 22, 2013, implying a possible shift in the U.S. monetary stance after 4 years of expansionary monetary policy. The Fed remained however unclear as to when the tapering would effectively start – primarily on the back of rising fears of an economic slowdown, would the tapering be implemented prematurely. In December 18, 2013 the Fed finally set a clear road map for the LSAP tapering, the latter being planned from January 2014 onwards.²⁸

Net flows to EMEs funds have been dropping steadily since May's announcement, suggesting a high sensitivity of investors *vis-à-vis* EMEs/AEs interest rate differentials in their investment strategy – although buoyant EMEs economic prospects.²⁹ Contrary to the Latin American and Asian crises in the 1990s, the drop observed in net flows to EMEs funds following the tapering announcement primarily resulted from fears of a shift in the Fed monetary policy stance – the latter remaining accommodative during the whole tapering period.

The Fed tapering announcements during this period have had a significant impact on financial markets. Indeed, until December 18, the date and the scale of the tapering were unknown, the tapering being then delayed by the Fed uncertainties concerning U.S. economic prospects. The tapering dummy will allows us to observe how investors' dissociate LCB and FCB funds in their investment strategy,

²⁷The benefits of rising rates differentials and U.S. monetary tools on capital flows towards Emerging markets from 2010 have particularly been highlighted by [Ahmed & Zlate \(2013\)](#) and [Fratzscher et al. \(2013\)](#).

²⁸As stated in the FOMC committee of December 18: "Beginning in January, the Committee will add to its holdings of agency mortgage-backed securities at a pace of 35 billion per month rather than 40 billion per month, and will add to its holdings of longer-term Treasury securities at a pace of 40 billion per month rather than 45 billion per month." See FOMC statement of 12/18/2013: <http://www.Federalreserve.gov/newsevents/press/monetary/20131218a.htm>.

²⁹Indeed, EMEs dependency to foreign denominated currency debt is far lower than during the 1990s. Higher foreign exchange reserves, better macroeconomic fundamentals and more developed local currency bond markets should allow EMEs to better cope with global shocks than during the previous crises.

given uncertainties on U.S. economic prospects and fears of an upcoming rise in U.S. rates. We expect net flows to local and foreign currency bond funds to react differently to the tapering period.

4 Estimation results

Given the existence of structural breaks in our OLS regression³⁰, the main data sample has been redefined and split for OLS estimations of net flows to GEM LCB funds, Asia LCB funds and Latin America FCB funds OLS (see Tables 1 to 2).³¹ Figure 5 provides the results of the Recursive CUSUM tests applied on our estimated models.

As expected, the J.P. Morgan GBI-EM index explains net flows dynamic to LCB funds in Asia and GEM. These results confirm the importance of local bond markets benchmarks for investors in the setup of investment strategy in EMEs bond markets through funds. GEM and Asia funds benefited from high LCB markets returns from 2010 to 2013, local currency bond outperforming the U.S. ten-year yield over the period (see Tables 1 and 2). EMEs GBI-EM benchmarks also explain the drop observed in net flows from May 2013 onwards given lower rate differentials – U.S. ten-year yield rising during that period – and slight increases in markets risk aversion as U.S. growth prospects remain uncertain.

Surprisingly, the tapering period dummy does not have a statistically significant impact on net flows to EMEs LCB funds, suggesting no direct effect of fears of tapering on LCB flows (see Tables 1 and 2). J.P. Morgan EMBI+ spread indices permit to explain net flows dynamic to EMEs FCB funds, except for Emerging Europe Funds. The effects of the dollar denominated debt benchmark remain however more subdued than the GBI-EM index on net flows to LCB funds. The tapering period in turn appears to be statistically significant, the tapering having a significant negative impact in Latin American, Asian and Global Emerging Markets. Data concerning Asia and GEM have however to be put in perspective with the fact that

³⁰Our structural break test is based on the "Chow test" ([Chow \(1960\)](#)), the only difference being that, break dates being unknown, we calculate the F-statistics for all potential change points and reject the null hypothesis of "no structural break" for a too large F-statistic

³¹Furthermore, given the presence of heteroskedasticity, GLS estimations have been computed for robustness purposes. The impact of heteroskedasticity remains however subdued and the new regression results obtained do not alter our conclusions.

net flows to LCB funds in those markets significantly outweigh FCB fund flows.³²

LCB markets development has been particularly important in Asia, due to intensive financial reforms following the Asian crisis in the late 1990s. The development of LCB markets has been however slower in Latin America due to persistent dollarization of Latin American countries.³³ As suggested by net flows volumes on average to FCB funds (see Table 5), Latin American markets still heavily rely on dollar denominated debt and it is particularly on these markets that tapering announcements negatively impacted the most net flows to FCB funds (See Table 3). Neither bond benchmarks nor the tapering period allow us to explain net flows to LCB and FCB funds dedicated to Emerging Europe markets. As shown in our stylized facts above, funds dedicated to this area have been witnessing ongoing withdrawal of capital flows since 2007, investors probably preferring to focus on more diversified markets such as GEM (See Table 4).

Investors' behavior mirrors contrasted development levels in emerging bond markets. Net flows towards LCB funds dedicated to GEM and Asia remain particularly driven by EMEs local bond markets attractiveness and immune the tapering effects. Net flows to FCB funds – especially in Latin America – however suggest a high sensitivity of investors to U.S. monetary policy announcements and to rising fears of an U.S. rate hike. Our results are in line with other empirical studies – such as [Burger & Warnock \(2006\)](#), [Burger & Warnock \(2010\)](#), [Miyajima et al. \(2012\)](#) – which emphasize the benefits of local currency bond markets in strengthening emerging markets financial systems. These results furthermore put in light differences between EMEs, in terms of bond market structure and sensitivity levels *vis-à-vis* global shocks – i.e. in our case the tapering effect – and suggest regionally fitted approach when analyzing debt-led capital flows towards EMEs.

The pull-back of stimulus in the U.S. underline the decisive role played by the Fed on global financial markets. Through forward guidance, the Federal Open Market Committee (FOMC) has provided investors with information – such as its view on the upcoming monetary policy stance – and a language that have contributed to maintain downward pressures on long term interest rates and improve markets

³²Net flows volumes to FCB and LCB funds differ significantly from an emerging market to another. While net flows to LCB funds outweigh flows to FCB funds in GEM, Emerging Europe and Asia, investors' primarily focus on FCB funds in Latin America. Net flows volumes give us a hint about the degree of development of LCB and FCB markets in the EMEs (see Table 5).

³³See [Goswami & Sharma \(2011\)](#) for Asian and [Jeanneau & Tovar \(2012\)](#) for Latin American bond markets development.

financial conditions. According to the Fed forward guidance, very accommodative monetary policy was expected to last as long as the U.S. unemployment rate remains above 6-1/2 percent.³⁴ However, with the rapid improvement of economic prospects – and especially market labor conditions – , the necessity of a LSAP tapering emerged earlier than expected. Would the Fed stick to its current forward guidance and react to the U.S. labor market improvement accordingly, might the effective tapering of LSAPs linger and impact dramatically capital flows movements to EMEs bond markets.

The tapering episode highlights the dependency of global emerging markets to U.S. monetary decisions, and shows in which extent Fed announcements and decisions can significantly affect emerging markets growth prospects. Following the subprime crisis, several studies have put in light the necessity of improvement of institutions in emerging markets to mitigate shocks transmission between AEs and EMEs. If the development of stronger institutions and particularly local currency bond markets appears as an indispensable prerequisite to contain adverse effects of global financialization, more cooperation between EMEs and AEs central banks may allow to reduce its detrimental effects on EMEs growth.

5 Conclusion

This paper highlights differences in investors' behavior *vis-à-vis* emerging economies' local (LCB) and foreign (FCB) currency bond markets in the context of the U.S. expansionary monetary policy from 2010 to 2013. In analyzing investors' net flows to LCB and FCB funds in various emerging markets, we evidence the main determinants of those flows, particularly following the Fed tapering announcement in May 2013. While investors focusing on EMEs LCB markets remain less sensitive to Fed monetary policy decisions, investors focusing on FCB markets show much more degree of sensitivity to the tapering of asset purchase pace in 2013.

We furthermore show that investors behavior towards the different types of EMEs bond markets differs, FCB markets being more prone to reversals on the back of external shocks and particularly of adverse U.S. monetary policy decisions than LCB markets. In a background of accrued financial globalization, developed LCB markets are decisive to mitigate adverse capital movements resulting from U.S.

³⁴With U.S. unemployment rate, the Fed also disclosed inflation targets in its forward quidance, see FOMC FAQ: http://www.Federalreserve.gov/faqs/money_19277.htm.

monetary decisions or announcements. Finally, our study highlights the significant role of Fed on net flows dynamic to funds dedicated to EMEs through its forward guidance, and underlines the ongoing sensitivity of emerging markets to the U.S. monetary shock transmission.

A promising extension of the present study would be to assess at a country level the sensitivity of investors' net flows to EMEs equity and bond funds global external shocks on the background of the effective LSAP tapering and markets growth anticipations in the United-States. Relying on time-varying parameters (TVP) models and high frequency data to investigate closer changes in net flows movements in calm and stressed periods would also provide a more precise overview of shifts in investor's behavior *vis-à-vis* EMEs markets. We leave this approach for further research.

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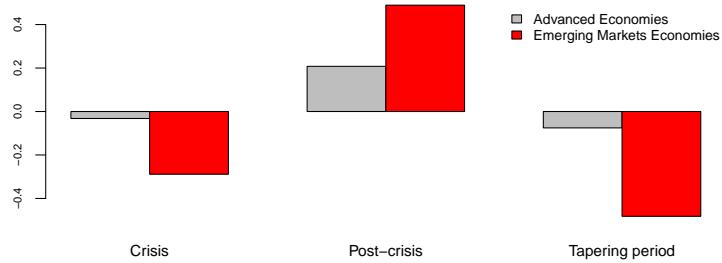
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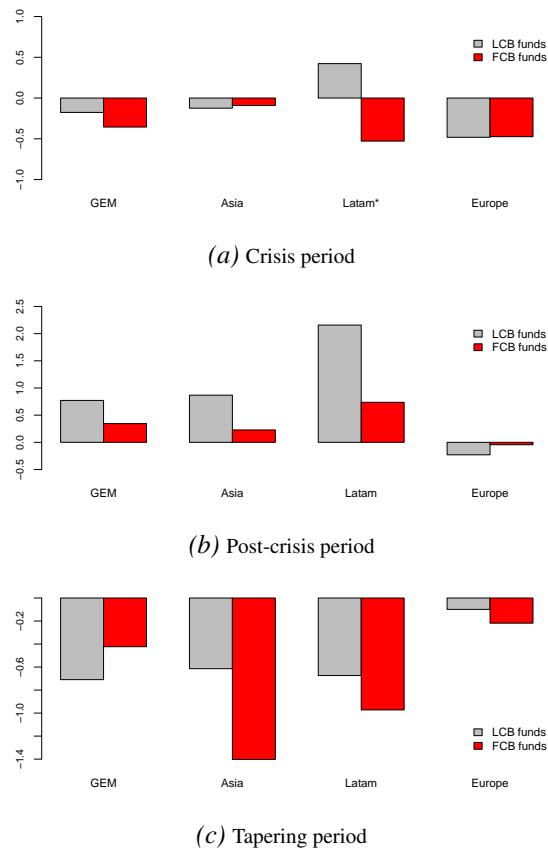
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Figure 1: Mean net flows to bond funds from 2007 to 2013 (in % of AUM)



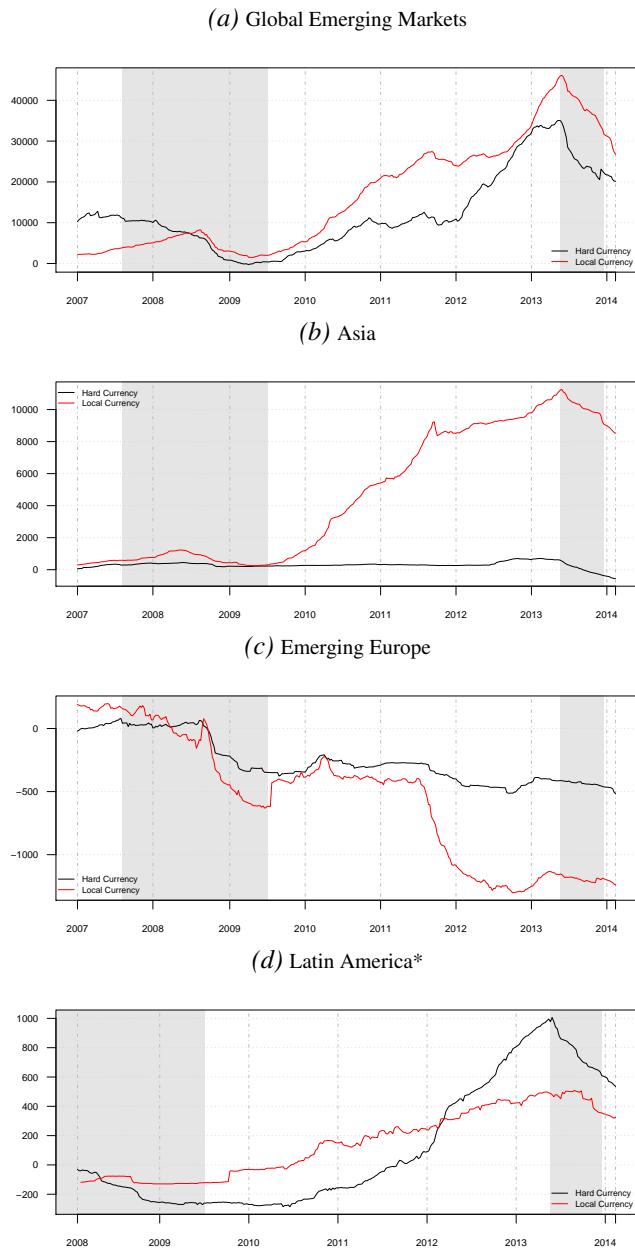
Source : EPFR Global. The crisis period goes from August 2007 to July 2009, the post-crisis period from July 2009 to May 2013 and the tapering period from May 2013 to December 2013.

Figure 2: Investors' net flows to EMEs funds from 2007 to 2013 (in % of AUM)



Source: EPFR Global. The crisis period goes from August 2007 to July 2009, the post-crisis period from July 2009 to May 2013 and the tapering period from May 2013 to December 2013. LCB and FCB stand for net flows to local and foreign currency bond funds respectively. *Due to missing values, the Latam data sample goes only from March 2008 to July 2009, overstating significantly inflows in the area during the crisis.

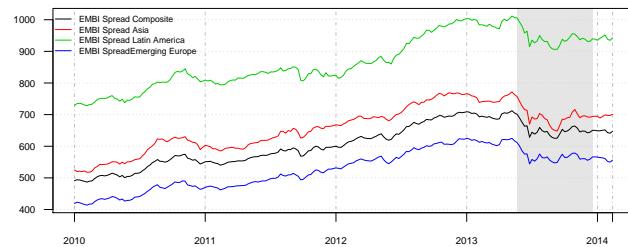
Figure 3: Net flows in volumes to EMEs funds dedicated to bond markets from 2007 to 2013 (in mln USD)



Source: EPFR Global. *Due to missing values, the Latam data sample goes only from March 2008 to July 2009, overstating significantly inflows in the area during the crisis.

Figure 4: Selected Variables

(a) Spreads J.P.Morgan EMBI+ vs. U.S. ten-year yield



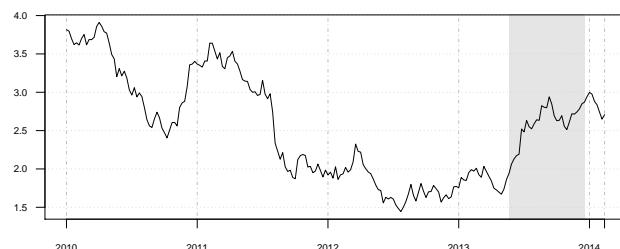
Souce : Datastream.

(b) J.P.Morgan GBI-EM in selected Emerging Markets



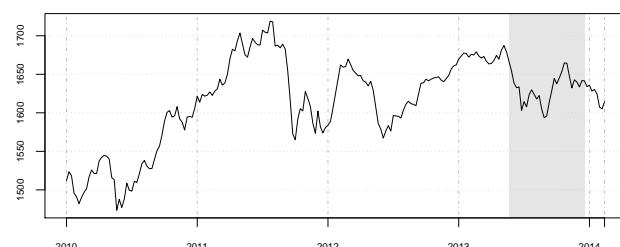
Souce : Datastream.

(c) U.S. ten-year yield



Souce : Datastream.

(d) MSCI Emerging Markets Currency index



Souce : MSCI, Datastream.

Table 1: OLS estimations Investors' net flows to GEM Funds

Dependent Variable	LCB ($k = 1$)			FCB ($k = 2$)
	(1)	(2)	(3)	(4)
<i>Constant</i>	1.11***	-0.01	0.007	0.11***
y_{1t-1}^k	0.68**	0.47***	0.74***	0.46***
$Spread_{1t}^k$	0.50	0.24***	0.15***	0.04***
VIX_t	-0.04	-0.02	-0.09**	-0.03*
TD_t			-0.14	-0.31**
Adjusted R-squared	0.12	0.30	0.72	0.48
Nbr. of Obs.	44	87	76	207
Recursive CUSUM				
Significance test ($p - value$)	0.118	0.276	0.061	0.364

Note: LCB and FCB stand for investors' net flows to funds dedicated to local and foreign currency bond markets respectively. ***, ** and * indicate significance at the 1%, 5% and 10% confidence level respectively. Standard errors are in brackets. Column (1) corresponds to estimations for the sample covering the 03/03/2010 - 29/10/2010 period, column (2) the 05/01/2011 - 29/08/2012 period, column (3) the 05/09/2012 - 12/02/2014 period and column (4) the whole sample, i.e. 03/03/2010 - 12/02/2014.

Table 2: OLS estimations Investors' net flows to Asia Funds

Dependent Variable	LCB ($k = 1$)		FCB ($k = 2$)
	(1)	(2)	(3)
<i>Constant</i>	0.28**	0.01	0.05
y_{2t-1}^k	0.5***	0.63***	0.35***
$Spread_{2t}^k$	0.71**	0.27**	0.02**
VIX_t	-0.04	-0.06**	-0.03
TD_t		-0.15	-0.91***
Adjusted R-squared	0.23	0.51	0.28
Nbr. of Obs.	82	107	207
Recursive CUSUM			
Significance test ($p - value$)	0.134	0.477	0.675

Note: LCB and FCB stand for investors' net flows to funds dedicated to local and foreign currency bond markets respectively. ***, ** and * indicate significance at the 1%, 5% and 10% confidence level respectively. Standard errors are in brackets. Column (1) corresponds to estimations for the sample covering the 07/07/2010 - 25/01/2012 period, column (2) the 01/02/2012 - 12/02/2014 period, column (3) the 03/03/2010 - 12/02/2014 period.

Table 3: OLS estimations Investors' net flows to Latin America Funds

Dependent Variable	LCB ($k = 1$) (1)	FCB ($k = 2$) (2)	FCB ($k = 2$) (3)
<i>Constant</i>	0.68***	0.38	0.67***
y_{3t-1}^k	0.07	-0.01	0.73***
$Spread_{3t}^k$	0.19	0.62	0.03*
VIX_t	0.02	0.01	-0.02
TD_t	-1.1	-0.15	-1.28***
Adjusted R-squared	0.02	-0.01	0.38
Nbr. of Obs.	207	57	150
Recursive CUSUM			
Significance test ($p - value$)	0.143	0.56	0.401

Note: LCB and FCB stand for investors' net flows to funds dedicated to local and foreign currency bond markets respectively. ***, ** and * indicate significance at the 1%, 5% and 10% confidence level respectively. Standard errors are in brackets. Column (1) corresponds to estimations for the sample covering the 03/03/2010 - 12/02/2014 period (2) the 03/03/2010 - 30/03/2011 period, column (3) the 06/04/2011 - 12/02/2014 period.

Table 4: OLS estimations Investors' net flows to Emerging Europe Funds

Dependent Variable	LCB ($k = 1$) (1)	FCB ($k = 2$) (2)
<i>Constant</i>	-0.12*	-0.26***
y_{4t-1}^k	0.23***	0.35***
$Spread_{4t}^k$	0.002	0.1
VIX_t	0.009	-0.08**
TD_t	0.001	0.22
Adjusted R-squared	0.03	0.15
Nbr. of Obs.	207	207
Recursive CUSUM		
Significance test ($p - value$)	0.298	0.452

Note: LCB and FCB stand for investors' net flows to funds dedicated to local and foreign currency bond markets respectively. ***, ** and * indicate significance at the 1%, 5% and 10% confidence level respectively. Standard errors are in brackets. Column (1) and (2) correspond to estimations for the sample covering the 03/03/2010 - 12/02/2014 period.

Table 5: Mean weights of net flows to FCB funds over net flows to LCB funds (2012 to 2014)

Area	Mean weights
Global Emerging markets	0.74
Asia	0.03
Emerging Europe	0.36
Latin America	1.59

Source: EPFR Global

Figure 5: Recursive CUSUM tests

