

Cross-Border Capital Flows in Emerging Markets: Demand-Pull or Supply-Push?

June 2016

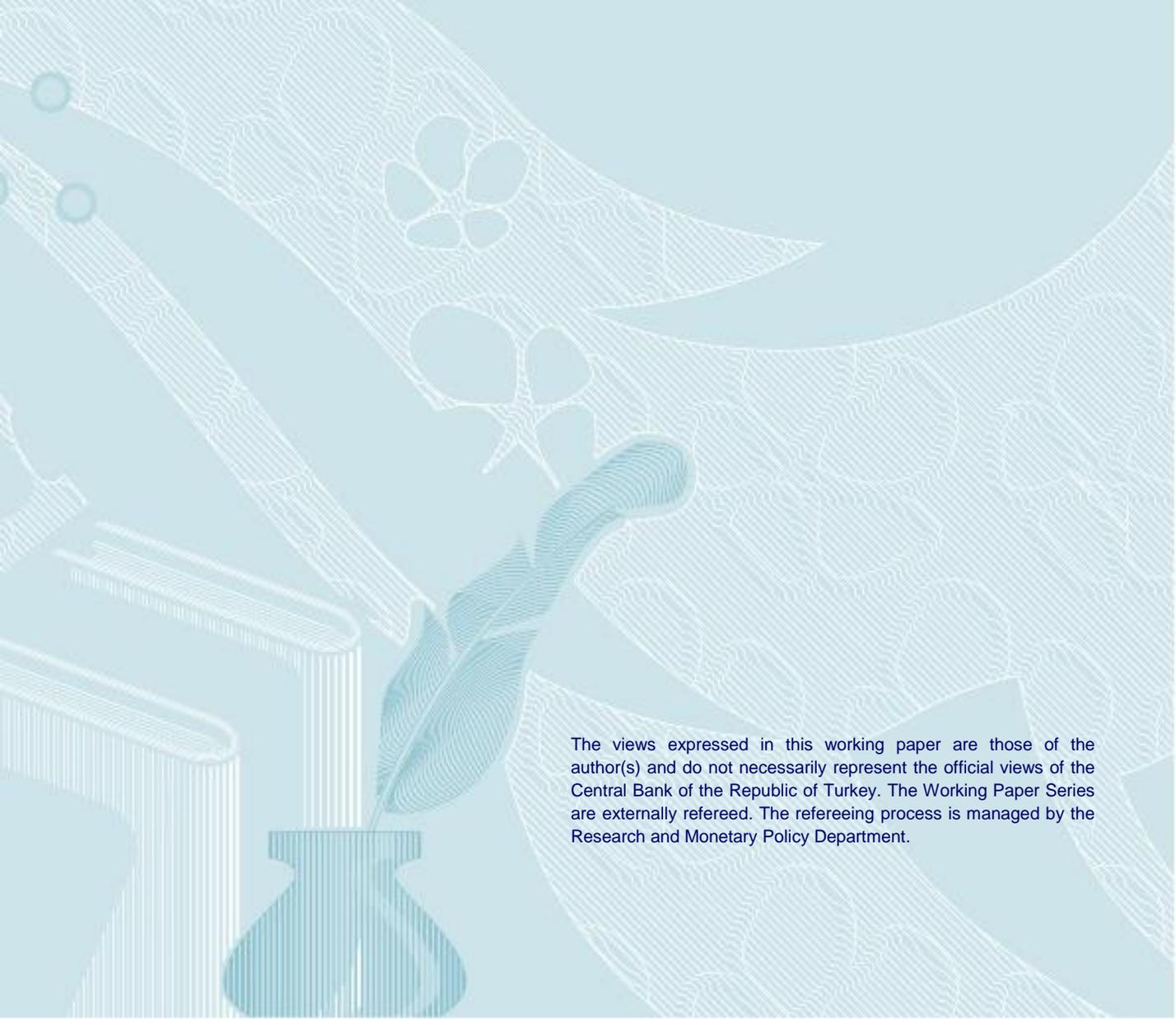
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Cross-Border Capital Flows in Emerging Markets: Demand-Pull or Supply-Push?

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***Abstract:** We disentangle the cross-border capital flows into demand-pull and supply-push components for four selected emerging markets: Brazil, Indonesia, Malaysia and Turkey. We employ vector autoregressions with sign restrictions method, using two variables: noncore liabilities of banks and the money market rates. Demand shocks are defined as those that move these two variables in the same direction and supply shocks as those that move them in opposite directions. Our results imply that, in the wake of the global financial crisis, worsening demand conditions in the recipient countries and the high levels of uncertainty were the main determinants of the decline in cross border flows. However, once the unconventional policy measures by the advanced economies were put into effect, the proliferation of global liquidity worked as a push factor for cross border flows.*

Keywords: Financial stability, capital flows, non-core liabilities, sign restrictions.

JEL Codes: C32, E44, G21.

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I. Introduction

The post-crisis era reveals a faster recovery in credit growth for the emerging markets as opposed to the advanced countries. Figure 1 depicts the change in credits as a percentage of GDP for 14 advanced countries and 14 emerging markets. The graph suggests an instant plunge in credits after the crisis in both country groups. However, advanced countries and emerging markets decouple in a noticeable way in two years' time after the initial shock.

INSERT FIGURE 1 ABOUT HERE

A significant cause of the rapid recuperation in credits in emerging markets is the surge in direct or indirect cross-border capital flows to these economies. The direct channel refers to the credits extended to the domestic private agents by foreign financial institutions. The indirect channel describes an intermediary, usually a bank, raising wholesale funding from abroad and then lending to local customers. Both channels functioned well for emerging markets in the last years due to the permissive global financial conditions, raising concerns for domestic authorities (Borio et.al, 2011).

This study focuses on the developments in the indirect cross-border flows through the lens of the liabilities side of the balance sheet of the banking sectors of four selected emerging economies: Brazil, Indonesia, Malaysia and Turkey. During normal times, banks finance their lending through domestic deposits which constitute the core liabilities of a bank. In contrast, during booms, when domestic deposits are insufficient to finance the growth in lending, banks resort to external funding, reported as the non-core liabilities of a bank. Periods of surges in capital inflows generally tend to be associated with rapid increases in these non-core liabilities of the banking system, which may convey useful information on the stage of the financial cycle and may possibly serve as an early warning indicator of growing risks on financial stability (Hahm et al., 2013). Figure 2 below illustrates that increases in portfolio flows to emerging economies in the aftermath of the global financial crisis are associated with significant increases in non-core liabilities of the banks for all of our sample countries.

INSERT FIGURE 2 ABOUT HERE

We delve into the relationship between the funding structure of the financial intermediaries and their risk-taking behaviour by analysing the non-core liabilities of the banking sector. For this purpose, we decompose the movements of non-core liabilities into their demand-pull and supply-push components. Differentiating demand and supply components of cross-border flows is crucial from the policy perspective, as it provides valuable information regarding the appropriateness of countercyclical macroprudential policies.

The decomposition is carried out by means of vector autoregressions with sign restrictions, using the framework proposed by Kim et al. (2013). In a two-variable VAR model, we employ non-core liabilities as the quantity variable, and, to capture the ease of funding in the credit market, we use money market rates as the price variable. By means of sign restrictions, demand and supply shocks are defined in a way to decompose the non-core liabilities into their demand and supply-led components. In this regard, we define demand shocks, which indicate the upsurge in credit by local banks, as those that move quantity and price variable in the same direction. On the other hand, supply shocks, which are related with liquidity conditions, are supposed to move quantity and price variables in opposite directions. This methodology allows us to differentiate the domestic component of the amplification mechanism in credit market from the global liquidity impact. The analysis is conducted by dividing the sample that spans the period from 2004 to date, into three parts where the Lehman and the peak of the Eurozone crisis constitute the separating dates in between the regions. This way, significant similarities are observed in terms of the movements of non-core liabilities as well as their demand and supply components.

Our results suggest two important features of the cross-border flows in the aftermath of the global financial crisis. First, the initial decline in non-core liabilities after the crisis is mainly demand driven for most countries in our sample. However, the impact of the quantitative easing reveals itself with a more pronounced supply led growth in cross-border flows almost two years' time after the crisis. This result implies that in the wake of the crisis, worsening demand conditions in the recipient countries and the high levels of uncertainty were the main determinants of the drop in capital flows towards these countries. However, once the unconventional policy measures by the advanced economies were taken in, the proliferation of global liquidity worked as a push factor for capital flows into emerging markets.

Second, after the tapering signal in mid-2013, as capital inflows start to decline, the negative supply-push impact can be observed through outflows. However, it should be noted that, for Indonesia and Turkey, following the tapering signal, positive demand-pull component of the movements in non-core liabilities dominates this negative supply push impact. That heterogeneity among countries underscores the need to take into account the differences in the prevailing domestic market conditions and the countercyclical policy responses of authorities in emerging markets. Along this line of reasoning, we further examine the relationship of the movements in non-core liabilities with the macroprudential measures taken by our sample countries.

The paper is structured in five sections. After this brief introduction, the second section motivates our choice of non-core liabilities among other alternative systemic risk indicators to monitor the vulnerabilities in the financial system. Later on, some stylized facts for the countries are documented. In particular, we elaborate on the components of capital inflows, the procyclicality of bank-intermediated flows and the relationship between capital flows, non-core bank liabilities and credit growth. Our focus on credit growth is also essential to understand our motivation of disentangling demand and supply components for the cross-border capital flows. Especially, for the demand-pull forces, the credit demand conditions as well as the risk-taking behaviour of the intermediaries are suggested as important determinants of the capital flows in emerging markets. This section also includes a brief review of the literature and reports some macroprudential measures taken by our sample countries. The third section describes the data and the methodology. The fourth section documents the results of our empirical analysis. The fifth section concludes.

II. Stylized Facts and Literature Survey

The recent global financial crisis period has shown once again that capital flows may amplify the business and financial cycles and lead to systemic risks in the recipient emerging economies. To what extent these flows may raise concerns for the incumbent economy from the stability perspective depends on their types¹. Typically, FDI flows and portfolio equity flows are less likely to reverse sharply and even if they do, the damage, in most cases, is much less compared to a sudden stop of bank flows. Debt type inflows, on the other hand, are mostly

¹ Capital flows differ depending on its nature of the claim (debt or equity); its denominated currency (domestic or foreign); its investor type (portfolio, foreign direct or bank) and its maturity (short or long).

intermediated through the banking system and they lead to rapid domestic credit growth, which in turn poses risks to financial stability. Moreover, risks in such a case are much higher for an incumbent economy struggling with shrinking GDP, price deflation and increasing default risks.

Bank related flows display the most procyclical and volatile component of the capital inflows. Figure 3 illustrates this, displaying the sharp withdrawal of aggregated bank flows from forty one countries, including many emerging economies, starting from the last quarter of 2008. It is apparent from the figure that the volatility of the banking sector flows is much higher than the volatility in the remaining types of capital flows. This relatively higher volatility of bank-related flows helps us to rationalize our choice of non-core liabilities of the aggregate banking sector, among other indicators of financial risk. Along this line of reasoning, we first document some stylized facts on the relationship between capital flows and the credit growth in this section. Later, we explore the broad macroprudential measures taken by the emerging economies in our sample. Lastly, we define non-core liabilities, document their procyclical behaviour and volatility and further motivate our approach on disentangling the demand and supply components of these aggregates, in comparison with the previous literature.

INSERT FIGURE 3 ABOUT HERE

i) Credit Growth and Macroprudential Policies in our Sample Countries

Capital flows and the resulting growth in credit in emerging markets increase macrofinancial risks through different channels, driving central banks to keep an eye on the resilience of the financial system along with their traditional price stability objective². Hence, the post-crisis period has witnessed the introduction of many novel macro-prudential policy tools designed for the era of abundant global liquidity, as well as the traditional ones. Remarkably, most of these policies were conducted by emerging markets which encounter stronger economic and financial cycles compared to the advanced countries, partially due to the intensity and the volatility of the capital flows (Claessens et al., 2013). Recently, a documentation of macroprudential policies conducted by 119 countries based on an IMF survey points out a

² The literature suggests excessive credit growth as an important predictor of financial crises. See Gourinchas and Obstfeld (2012), Schularick and Taylor (2012) and references therein.

positive relationship between the implementation of macroprudential policies and intensity of cross-border funding (Cerutti et al., 2015). Similarly, Ghosh et al. (2014) examines the cross border capital flows of 71 countries and finds a positive impact of capital account restrictions on reducing these flows. Akıncı and Rumsey (2015) suggests that capital control policies targeting the banking sector are more successful than the portfolio restrictions on curbing the credit growth^{3,4}.

The emerging markets in our sample are selected according to the data availability as will be described in the next section. These countries differ in terms of the macrofinancial risks that are accumulated through the vast capital inflows after the financial crisis; though they have some remarkable similarities both in this matter and the corresponding macroprudential approaches. We briefly provide some common patterns below for our sample countries, referring the reader to the comprehensive studies -the aforementioned ones for comparative analyses and the ones in the next paragraphs for individual country cases- for an extensive exploration of the macroprudential policies, due to our space limitations. Among a vast sphere of policy practices, our examples are selected to motivate our focus on noncore liabilities as an indicator of financial risk that will be discussed following these country case expositions.

First, for countries with a strong external demand (or with high dependence on imported inputs), credit growth usually leads to a widening current account deficit, increasing their vulnerability against sudden stops⁵. Among our sample countries, the strong co-movement between credit growth and current account deficit is illustrated in Figure 4 for Turkey. In view of that, Turkey has applied countercyclical macroprudential rules aiming towards curbing credit growth in the recent years. For this purpose, Central Bank of the Republic of Turkey altered the required reserve ratios for foreign exchange denominated liabilities in order to encourage the banks to extend the maturity of their non-core liabilities (CBRT, 2015, pg. 13-14).

INSERT FIGURE 4 ABOUT HERE

3 Other examples of case studies are Zhang and Zoli (2014), Bruno et al. (2015) that examine impacts of the capital flow management policies for Asia-Pacific economies.

4 There are also studies which find a partial or no effect for policies implying some form of a capital control on volatility of capital flows such as Forbes and Warnock (2012) or Binici et al. (2014).

5 Phillips et al. (2014) finds a negative relationship between credit growth and current account balance. Furthermore, Ekinci et al. (2015) argues that the deterioration in the current account due to higher credit growth is more significant in developing countries compared to the advanced ones.

Second, as Vasconcelos and Tabak (2014) shows for Brazilian financial system, the ability of domestic banks to obtain foreign funds through carry trade has a positive impact on credit growth, but this comes with the risk of higher foreign exchange exposure. Moreover, Da Silva and Harris (2012) argues that higher demand for domestic assets due to differences in yields between advanced economies and emerging markets put pressure on Brazilian currency to appreciate. In addition to this positive demand shock, global rise in commodity prices was another factor behind inflationary pressures. As a response to these risks of overheating, Brazil applied several macroprudential policies, including different reserve requirements for banks with short foreign exchange positions or capital requirements for certain market segments.

Indonesia was also a recipient of capital flows in the recent years. As a report by Bank of Indonesia (2012) documents, the higher reliance on short-term funding by domestic banks would increase the liquidity risk for the intermediaries. Authorities implemented macroprudential policies including reserve requirements based on loan to deposit ratios and introduction of loan-to-value ratios to curb excessive lending in housing and automotive loans (Bank of Indonesia, 2015).

Regarding the liabilities of Malaysian banks, a recent study argues that, the domestic banks -once bitten twice shy- became less reliant on interbank and wholesale funding after the Asian financial crisis of 1997 (BIS, 2015, pg. 233). However, the surge in external borrowing of non-financial corporations points out to potential problems in the stability of banks' funding sources. This indirect impact is also important because, while the deposits by nonfinancial corporations seem more reliable than that of financial institutions, they are still riskier than that of household deposits. This instability intensifies when the firms act as surrogate financial intermediaries. Shin (2012) gives the example of China where banks cannot borrow from international markets, yet firms can obtain foreign loans and deposit these proceedings into the domestic banking system as collateral⁶. Hence, the open position of the corporate sector could trigger a system-wide shock in case and should be monitored closely. Other than this channel, property and retail lending sectors were at the focus of the macroprudential policies in Malaysia, such as the imposition of a real property gains tax or loan-to-value limit on housing loans (BIS, 2015, pg. 239).

⁶ Hattori et al. (2009) provides another interesting example of this indirect effect as the funding of Japanese firms in 1980s through securitization.

ii) *Monitoring the non-core liabilities as a financial risk indicator*

The macroprudential policies can be broadly classified into two groups according to their focus (Borio, 2010). On the one hand, countercyclical buffers concentrate on the *time* dimension, i.e. the behaviour of the systemic risk over time. On the other hand, the accumulation of risk in the overall financial sector at a particular moment (e.g. the correlation of exposures under alternative network structures) is monitored by policy tools that are designed to capture the *cross-sectional* dimension.

Among alternative macroprudential tools (such as market-based indicators, early warning indicators or macro stress testing approach) one group that stands out in terms of simplicity and granularity is that of balance sheet indicators⁷. Considering the role of the balance sheet interlinkages within the financial system in a systemic breakdown, Hahm et al. (2013) proposes a classification of the banks' liabilities by the holder of the claim, which they argue, would provide information about their reliability and stability under different periods of the economic cycle. They suggest that, the *core* liabilities, such as demand and time deposits of the *household sector* are reliable and relatively stable sources of funds for banks. The growth rate of these deposits is usually consistent with that of the household wealth during the economic cycle. However, during booms; loan demand growth might be higher than that of the deposits. In these expansionary periods, banks might recourse to other, less reliable and more volatile source of funds such as short-term foreign debt or interbank borrowing, mainly derived from *other financial institutions*. A rise in these *non-core* liabilities in the balance sheet of banks indicates vulnerability against liquidity shocks for two reasons. First, as a result of their short-term nature and unreliability, it would be hard to rollover these funds during a liquidity squeeze. Second, and more importantly, enhanced cross-lending between domestic banks increases the systemic risk due to the contagion effect stemming from bilateral exposures. Hence, banks might play an *active* role in the *propagation* of the financial shocks, rather than being *passive* intermediaries transferring foreign funds into the economy in order to absorb the domestic credit demand.

⁷ Borio and Drehman (2009) and Galati and Moessner (2010) provides a review of these different indicators under different macroprudential policy frameworks.

Figures 5 to 8 illustrate the developments of the non-core liabilities of the aggregate banking sector and total credits for our sample countries⁸.

INSERT FIGURES 5 TO 8 ABOUT HERE

A first look at the figures reveals a strong correlation between non-core liabilities and credit growth for Indonesia, Malaysia and Turkey. For all these countries, the figures suggest non-core liabilities as a strong candidate to be an indicator of the recovery in credits⁹. For Brazil, on the other hand, the credits reveal a much more volatile pattern compared to the noncore liabilities, thus the figure does not suggest a strong correlation between the two variables for the whole sample period. Though, the post-crisis era witnesses some periods where the two series display a significant positive relationship.

Our interest in this paper lies in disentangling the supply-push and demand-pull factors that determine the movements in non-core liabilities of these countries. The supply-induced part is associated with the increase in global liquidity, both in pre-crisis period and post-crisis period. The demand-pull factor could be explained by two determinants which are not necessarily exclusive. First, as argued in Kim et al. (2013), non-core liabilities show a procyclical pattern, growing during boom times due to increasing risk-appetite of the banks. Hence, it is an important indicator of systemic risk that heightens during expansionary times. In addition to Kim et al. (2013), we argue that a change in demand-pull component could also be motivated with changing macroeconomic conditions, such as an expansionary monetary or fiscal policy. For example a government policy which would support the lenders that would buy their first houses (such as a reduction in housing taxes) would lower the risk of the loans in general and hence would in turn make the bank more eager to provide funds to absorb the credit demand. This would constitute an example for a case where the demand for non-core liabilities goes up but the risk-appetite of the bank does not change at all.

Another point where our approach differentiates from Kim et al. (2013) is our treatment of the non-core data. As discussed above and further detailed in the appendix, non-core liabilities consist of a domestic component of which the biggest portion is the interbank lending; and a foreign lending component. The ratios of the domestic component to the noncore liabilities vary

⁸ Total credits consist of household and private credits for each country. The details of the data of non-core liabilities is provided in the next section and the data appendix.

⁹ Kılınç et.al (2013) finds a positive and robust relationship between noncore liabilities and credit growth for Turkey.

for each country as given in Table 1. Note that while an increase in demand-pull component would increase both domestic and foreign components, at first glance, it is appealing to think that the foreign component would be more affected from the supply-push factor compared to the domestic factor. However, the increase in global liquidity would also imply more funds in the domestic market per se. Hence, some of these funds that could not be allocated as credits would lead to an increase in available funds in the domestic interbank market, which in turn would increase the interbank market transaction volume. Hence, we prefer to conduct our analysis with the total non-core liabilities measure instead of separating it into its domestic and foreign components.

INSERT TABLE 1 ABOUT HERE

III. Data and Methodology

There are two major setbacks of working with non-core liabilities data. First, there is no standard definition that is applicable to all countries due to the different characteristics of the banking sectors for different countries. Second, none of the countries in our sample provides publicly available non-core liabilities data for the aggregate the banking sector. Hence, we used aggregate banking sector statistics provided by the central banks of each country to calculate non-core liabilities data. We used the sum of the liabilities of the banking sector to the foreign sector and liabilities of the banks to other domestic financial corporations, where available. The data appendix provides a detailed definition of our noncore variables and their calculations. The price variables are money market rates for all countries and are taken from IMF-IFS database.

In order to decompose the total non-core liabilities of our sample countries into their demand-pull and supply-push components, we set up a vector autoregression (*VAR*) *model* for each country that uses a monetary aggregate and some price measure. Then, we impose *sign restrictions* on the impulse responses of the model to identify supply and demand shocks. In that regard, following Kim et. al (2013), we define demand shocks as those that move the quantity of the monetary aggregate and price in the same direction. In contrast, supply shocks are those that move the quantity and price in opposite directions. Next, we use these identified demand and supply shocks to construct the historical contributions of supply and demand shocks to the total non-core liabilities of sample countries. In our VAR models, foreign exchange rate adjusted total

non-core liabilities represent the monetary aggregate and money market rates represent the price measure to capture the tightness of credit markets.

Our sample period spans April 2004 to June 2015, depending on the country employed, as detailed in the appendix. We adopt an OLS approach to estimate the structural VAR model. This model uses yearly growth rates of the variables to ensure their stationarity. The lags of the VAR model are chosen based on the majority rule using several lag-length criteria like AIC, SC and HQ criteria. Sign restriction constructs different decompositions of variance-covariance matrix of VAR residuals and saves the ones satisfying the restrictions imposed on the impulse responses, given that the variance-covariance matrix of structural shocks is normalized to an identity matrix. We use 500 draws; hence, this analysis obtains a distribution of 500 solutions. Median values of these solutions are used as parameter estimates. Finally, the historical decomposition uses the Wold decomposition, which assumes that the value of any stationary stochastic series at time t can be written as the value of the series at time 0 plus the cumulative of shocks to the series from time 0 to time t . In our bivariate VAR context, the series is partitioned into two structural shocks, demand and supply shocks. Historical decomposition explains the contributions of each shock to the deviation of the series from its unconditional mean. Furthermore, if move further away from the initial periods employed, the effect of the initial value of the series will die off and historical decompositions will sum up to the value of the series as well.¹⁰

IV. Empirical Analysis

Figures 9 to 12 plot the historical decomposition of the noncore liabilities of the aggregate banking sector into the demand and supply components. The figures include the mean-difference of the noncore liabilities for each country (the straight line), the demand-pull component (the light bars) and the supply induced component (the dark bars). We divide the data sample into three regions for each country. The first one is the pre-crisis region, starting with the initial data point of the corresponding country and ending with the collapse of Lehman brothers in September 2008. The second region, which is indicated by the shaded rectangle in each graph, covers the crisis period up until the peak of the Eurozone crisis at August 2010. The third region includes dates following August 2010 and ends at the last data point of each country.

¹⁰ For estimation details, see "Ambrogio Cesa-Bianchi, 2014. "VAR Toolbox", sites.google.com/site/ambropo/".

INSERT FIGURES 9 TO 12 ABOUT HERE

Before disentangling the demand and supply components, a first look at the four graphs reveals significant similarities in the movements of noncore liabilities (straight lines) among our sample. First, as would be expected, the initial phase of the global financial crisis remarks a plunge in noncore liabilities for all countries. The recovery which starts in a couple of months continues until the Eurozone crisis deepens for all countries. For Malaysia and Turkey, the turning points of the series match exactly with the end of our shaded region in August 2010, while Brazil and Indonesia display a lag of a couple of months. In the third region, after the peak of the Eurozone crisis, the only notable similarity is that of Malaysia and Turkey's, both showing a decline between August 2010 and September 2012; an increase afterwards and a turning point around the end of 2013.

A careful investigation of the demand and supply components suggests that the immediate decline after the global crisis is mostly demand driven for almost all countries, with the exception of Indonesia which shows a relatively balanced decline in both components. This corroborates with the low growth levels of these countries in this period. In a similar manner, the initial phases of the recovery are mostly demand led for the countries in our sample. The supply induced part of the recovery is rather more observable in two years' time after the crisis, which could be attributed to the impact of quantitative easing policies conducted by the advanced country central banks.

In order to have a closer examination of demand and supply components, we report the share of the (absolute value of) supply shocks in total shocks (sum of the absolute values of demand and supply shocks) in Table 2. As discussed above, the supply induced part is below fifty percent for all countries in the middle region, between the Lehman and the peak of the Eurozone crises. Also, it is clear that on average, the change in noncore liabilities is mainly demand driven for Malaysia. A more stringent look at Figure 11 reveals that supply induced component is briefly effective in the second half of 2013; leading to inflows to Malaysia. For Brazil and Turkey, Table 2 suggests that the period between two crisis (middle region) is dominated by demand component whereas after August 2010 the main driver of the non-core liabilities is the supply led movements of capital.

INSERT TABLE 2 ABOUT HERE

A joint investigation of Figure 2 and the historical decomposition figures shows that with the tapering signal in May 2013, parallel to the declining trend in portfolio flows to EMEs the non-core bank liabilities of Brazil display a mild downturn, while those of Turkey and Indonesia continue to increase. For the latter countries, this can be explained by the dominant demand-pull component of their non-core liabilities during that era, owing to their much stronger GDP growth rates. On the other hand, during the same era, for Brazil, the supply-push component dominates the non-core liabilities of the banks, which explains the halt in the increase in non-core liabilities following the downturn in capital inflows. For Malaysia, the picture is much blurred in the sense that the increase in the non-core liabilities following the tapering is both demand and supply led.

V. Conclusion

The high level of international financial integration between economies all across the world generates significant risks both within and across national borders. Capital flows, in that sense, act as a transmission channel of risks across borders and thus may lead to the build-up of financial sector imbalances. Taking into account the fact that the bulk of these capital flows are intermediated through cross-border banking channels, effective regulation of cross-border banking is essential for domestic and global financial stability. In this paper we build upon this relationship between cross-border flows and financial vulnerability. By monitoring the growth of cross-border flows, a central bank may be able to put in place the appropriate macroprudential policy measures in a timely manner so that they could prevent the build-up of financial vulnerabilities.

Cross border bank lending constitutes the most procyclical component of the cross-border flows and it reverses abruptly when the financial cycle turns. In that regard, the procyclical patterns of cross-border banking sector liabilities to global banks may potentially serve as an indicator of the phase of the financial cycle. In this paper, we have explored one of the potential indicators of financial vulnerability, the so-called noncore liabilities of the banking sector, which we have differentiated into their demand and supply components. Through the instances of four emerging economies, Brazil, Indonesia, Turkey and Malaysia, we have argued that, during and after the global financial crisis, countries have exhibited similar patterns in terms of the movements in their non-core liabilities as well as their supply and demand components. Though, we have noted that the heterogeneity in terms of the prevailing domestic economic stances of

countries has necessitated a differentiation in the countercyclical macroprudential policies across countries. In this respect, we can see that differentiating the demand and supply components of the non-core liabilities of the banking sector is crucial from the overall macroeconomics policy perspective, as it provides valuable information regarding the appropriate design of countercyclical macroprudential policies.

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Table 1: The ratio of the domestic non-core liabilities to total non-core liabilities

	Domestic non-core / Total non-core (percent)
Indonesia	14
Malaysia	57
Turkey	38

Note: Brazil data only includes foreign liabilities since aggregate banking sector statistics for interbank lending is not available.

Table 2: The share of supply shocks in total (absolute value) of shocks

	Total	Before Lehman Brothers (Beginning of the country sample to September 2008)	Between Lehman and Eurozone Crisis (September 2008-August 2010)	After Eurozone Crisis (After August 2010)
Brazil	60.8	76.5	34.8	63.3
Indonesia	49.7	57.5	44.9	50.1
Malaysia	33.7	29.0	18.8	45.2
Turkey	49.2	62.9	26.0	51.7

Figure 1: Change in total credits / GDP

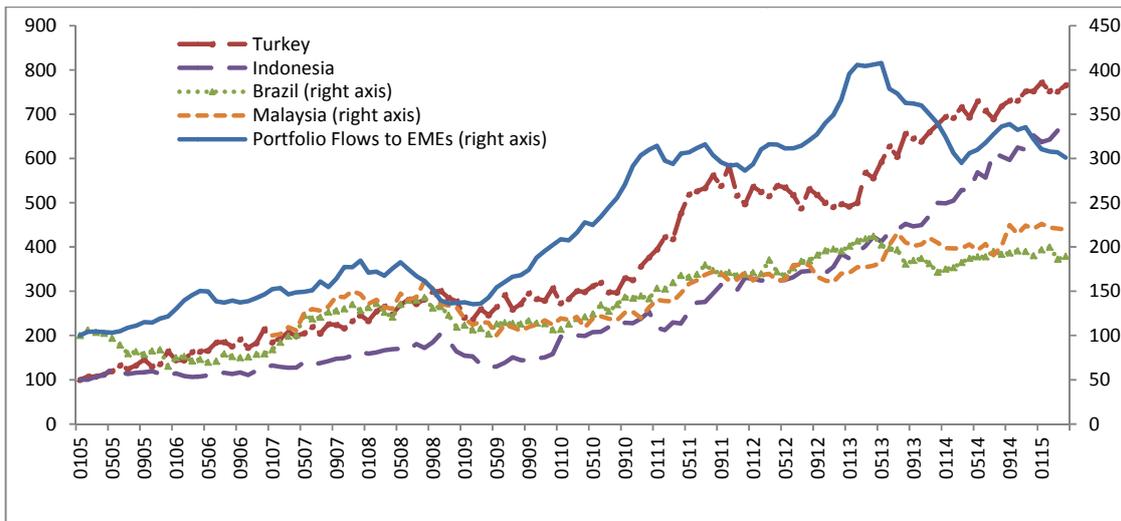
(q-o-q change, 4- quarters moving average, indexed as 2008Q3=1)



Notes: *i)* Advanced countries include Australia, Austria, Belgium, Denmark, Finland, France, Greece, Ireland, Malta, Singapore, Spain, Switzerland, UK and USA. Emerging markets include Brazil, Chile, Croatia, Czech Republic, Hungary, Indonesia, Malaysia, Mexico, Poland, Russia, South Africa, Thailand, Turkey and Ukraine. *ii)* Total credit figure is the total credits extended to private sector which is the sum of household credits and business credits for each country. Source: Central banks and/or government statistical agencies

Figure 2: Portfolio Flows to EMEs and Non-Core Liabilities

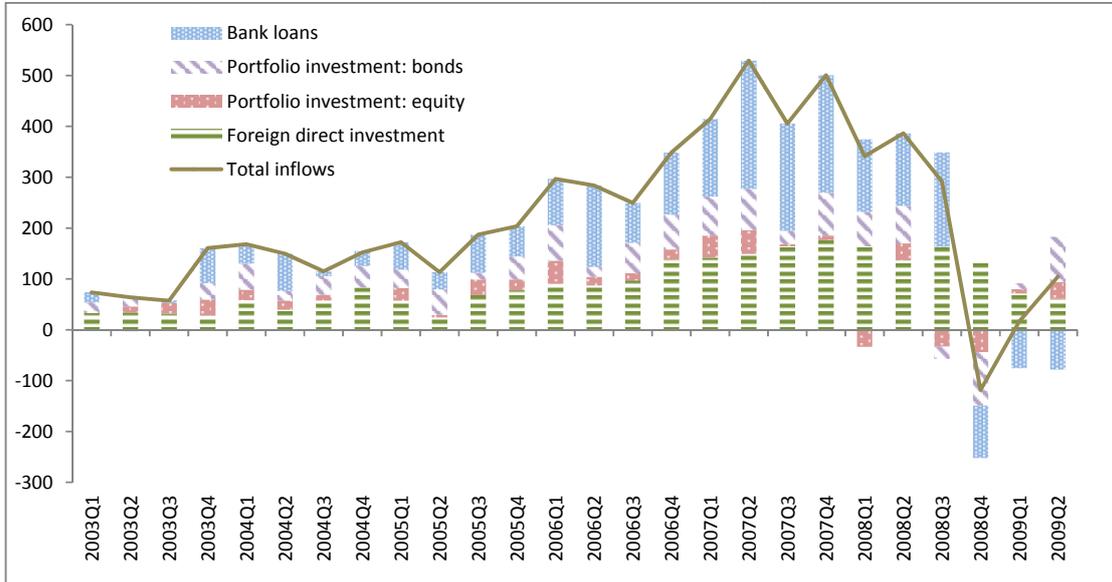
(billions, indexed as 2005m1=100)



Source: EPFR, Central Bank websites.

Notes: *i)* Total non-core liabilities are expressed in billions of domestic currency and are foreign exchange rate adjusted. *ii)* For Malaysia the non-core liabilities are indexed as 2007m1=100. *iii)* Portfolio flows to EMEs constitute the sum of bond and equity flows to EMEs. They are adjusted for exchange rates and prices.

Figure 3: Composition of Capital Inflows
(in billions of U.S. dollars)



Source: IMF Global Financial Stability Report, April 2010 p.123.

Notes: The figure displays the aggregated capital inflows to forty-one advanced and emerging economies.

Figure 4: Total Credit and Current Account Deficit, Turkey

(percent of GDP)

Left: Change in Total Credit, Right: Current Account Deficit

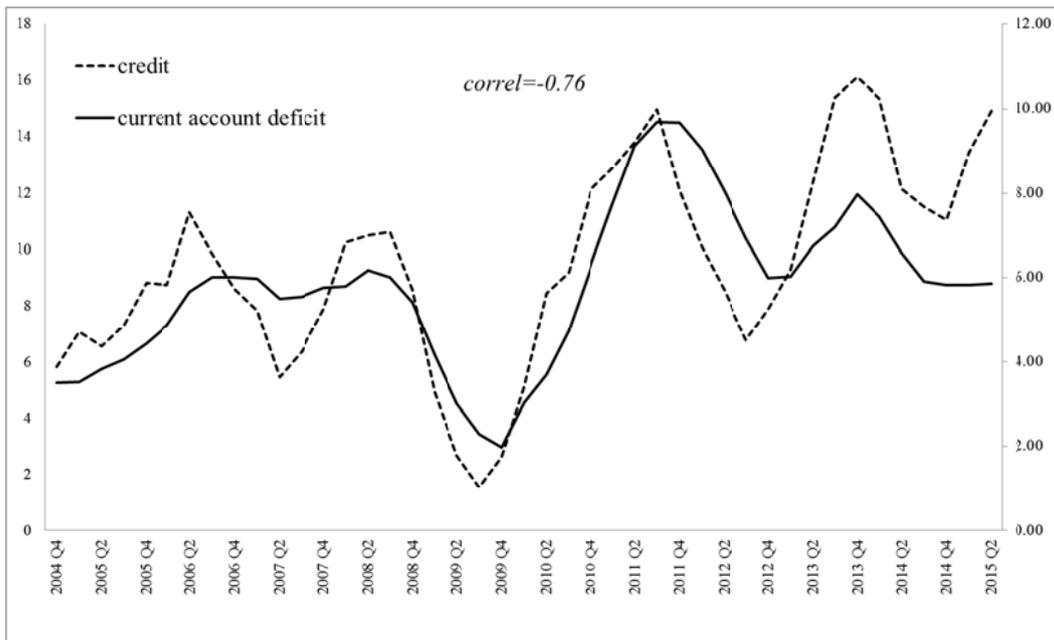


Figure 5: Non-core Liabilities and Total Credit, Brazil

Left: Non-core liabilities, Right: Total credit

(Change, 6-months average, billions of domestic currency)

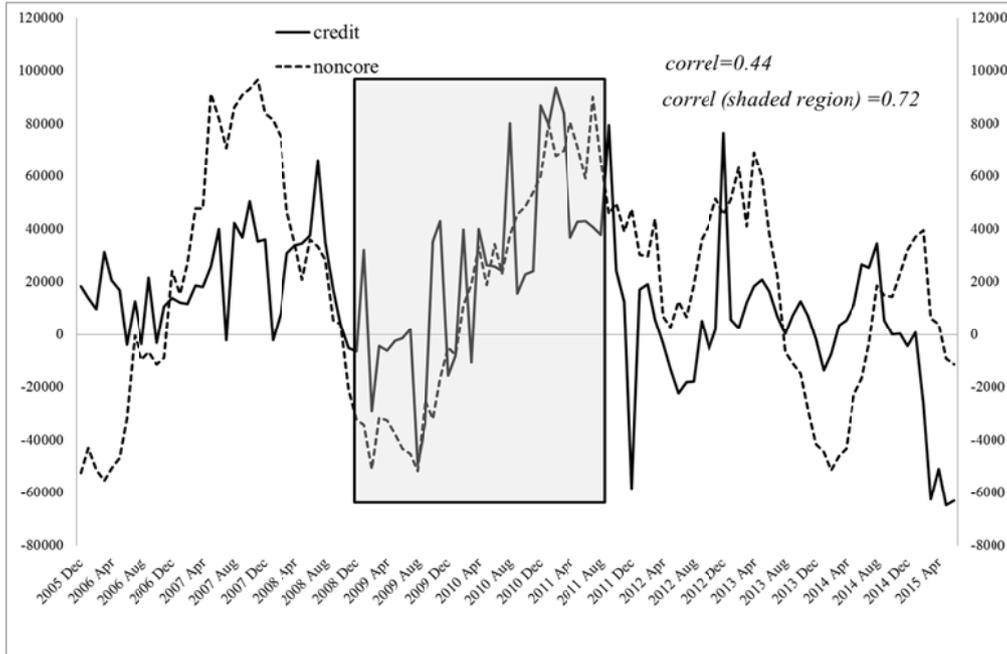


Figure 6: Non-core Liabilities and Total Credit, Indonesia

Left: Non-core liabilities, Right: Total credit

(Change, 6-months average, billions of domestic currency)

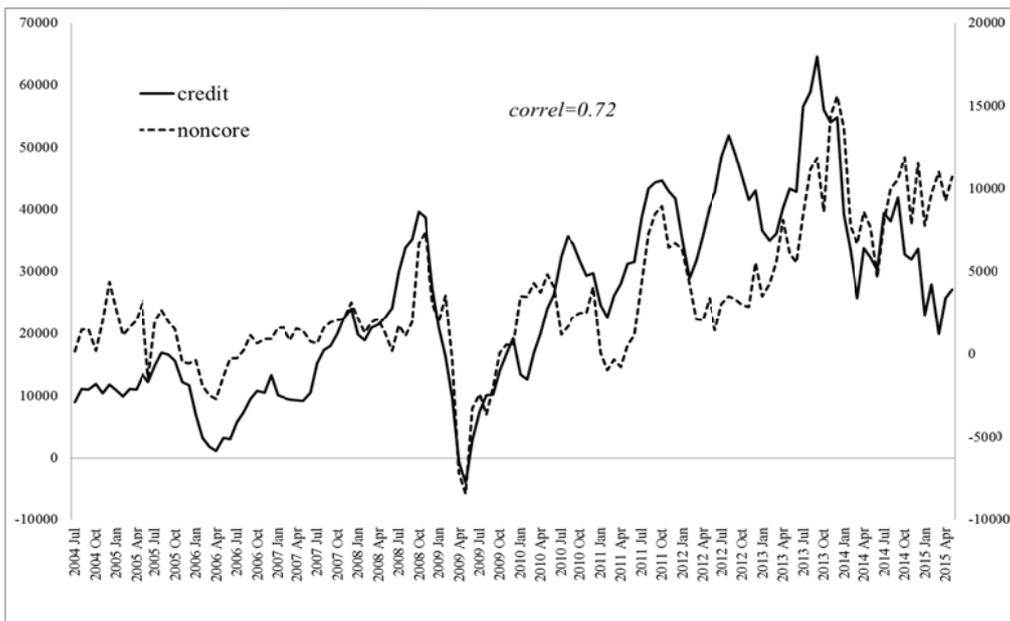


Figure 7: Non-core Liabilities and Total Credit, Malaysia

(Change, 3-months average, billions of domestic currency)

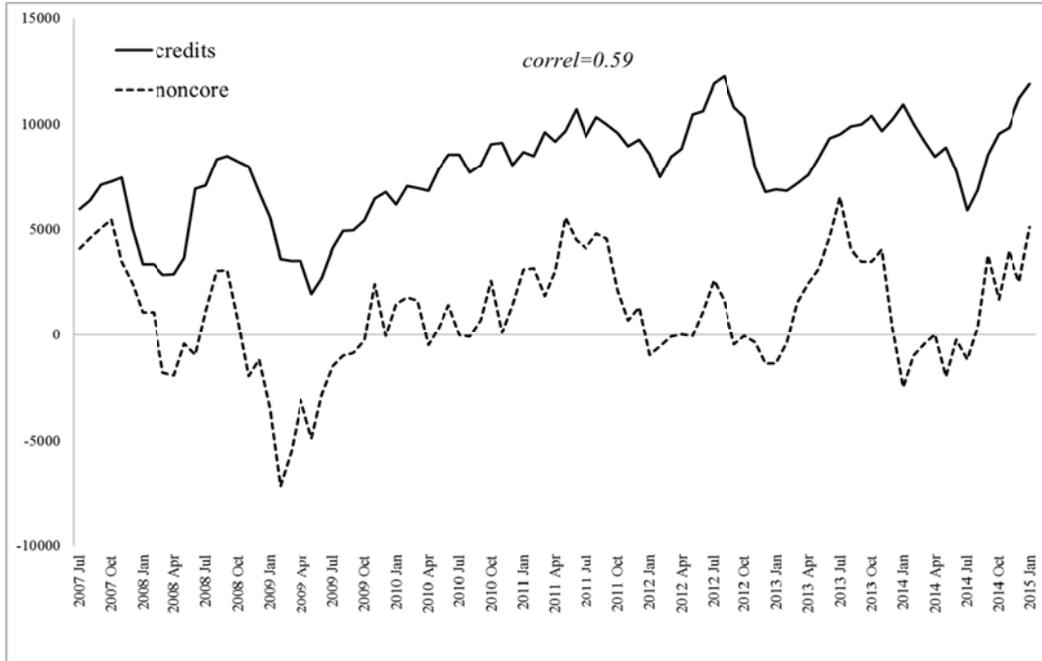
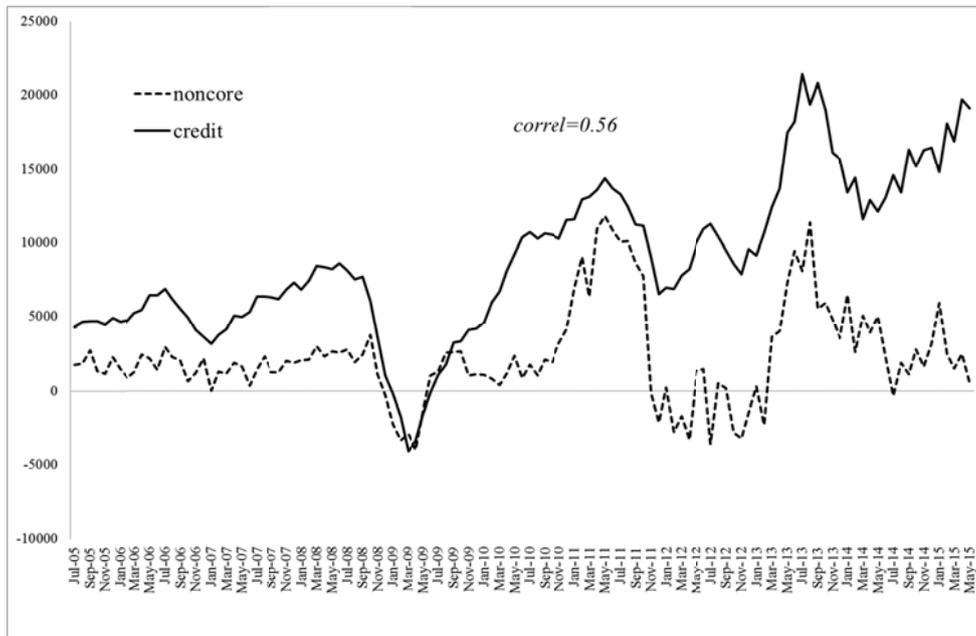


Figure 8: Non-core Liabilities and Total Credit, Turkey

(Change, 3-months average, billions of domestic currency)



Source: CBRT, BRSA

Figure 9: Historical decomposition of the y-o-y growth in non-core liabilities, Brazil

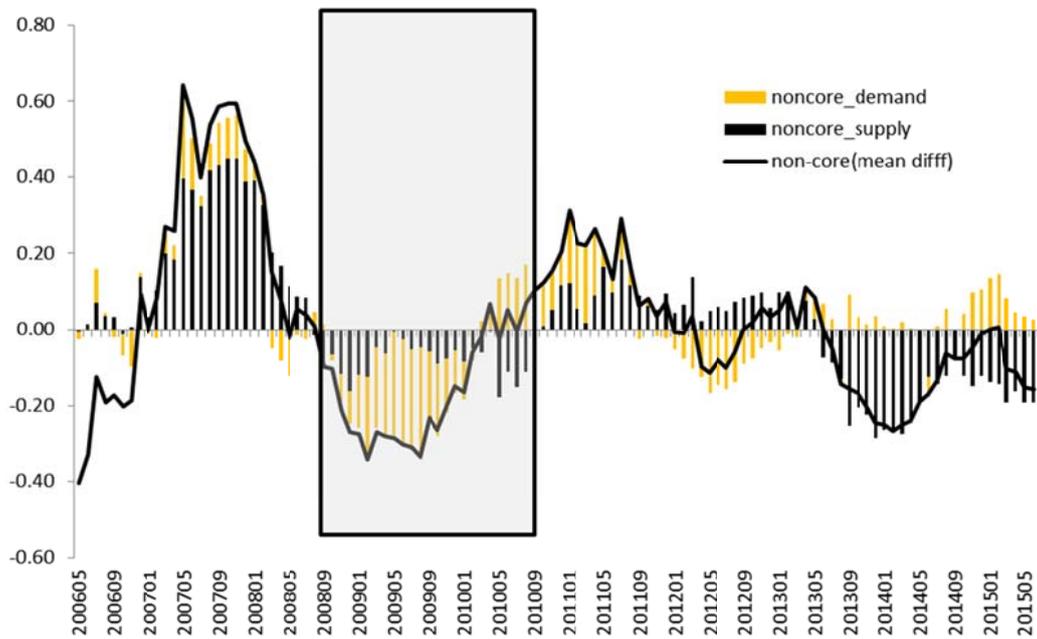


Figure 10: Historical decomposition of the y-o-y growth in non-core liabilities, Indonesia

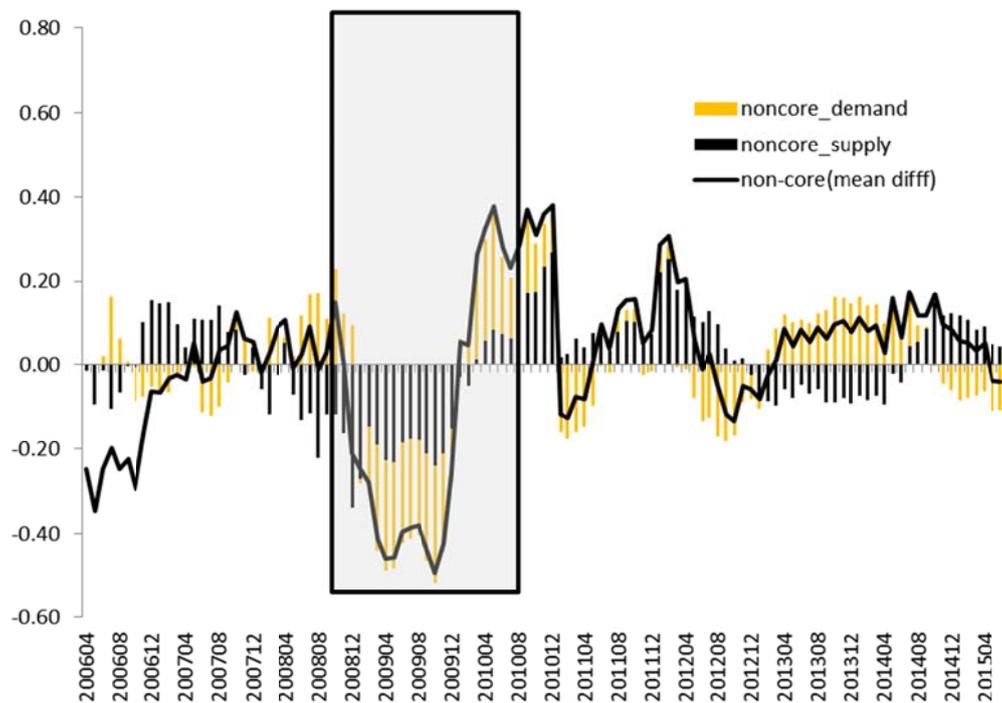


Figure 11: Historical decomposition of the y-o-y growth in non-core liabilities, Malaysia

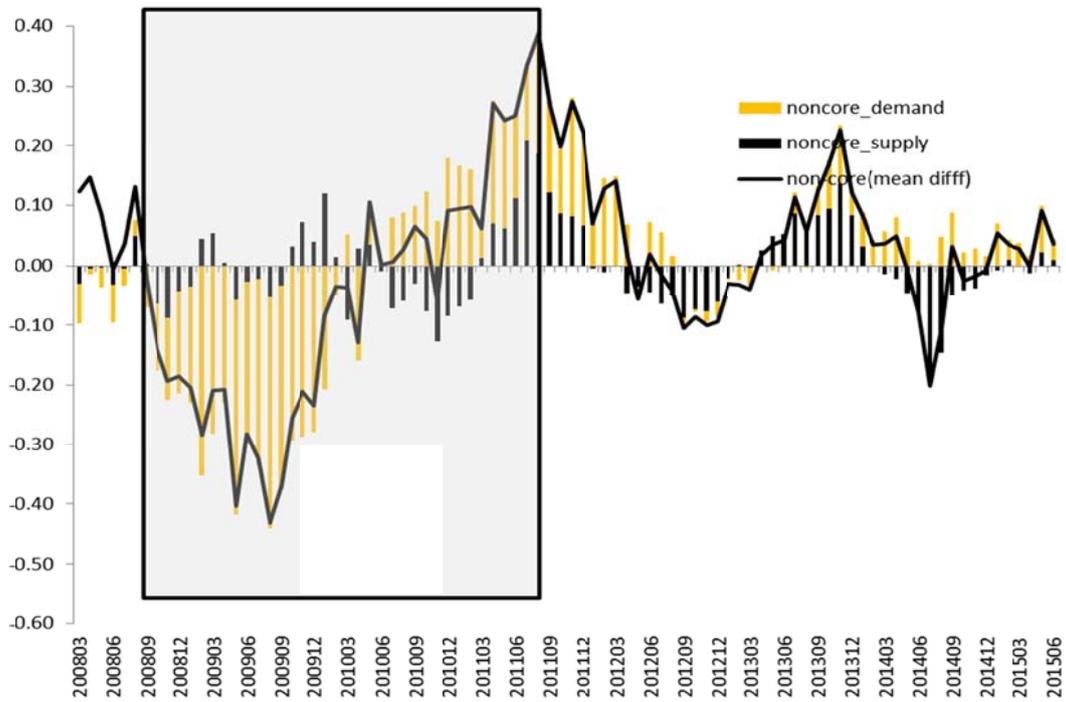
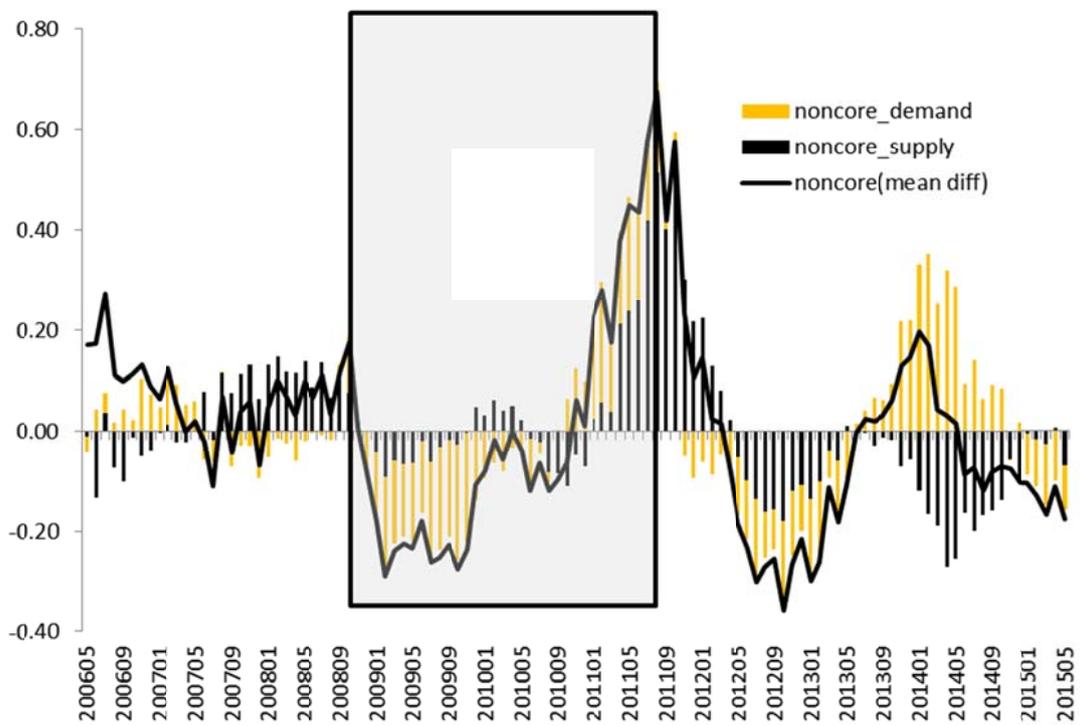


Figure 12: Historical decomposition of the y-o-y growth in non-core liabilities, Turkey



Appendix: Noncore Liabilities Data

Country	Noncore Definition (all items below are collected from the liabilities side of the aggregate balance sheet of the banking sector for each country)	Data Source	Data Range
Brazil	Liabilities to Nonresidents	Banco de Brazil	May 2006 -June 2015
Indonesia	Liabilities to Nonresidents + Liabilities to Other Financial Corporations	Bank Indonesia	April 2004-June 2015
Malaysia	Amount Due to Designated Financial Institutions (Commerical Banks, Islamic Banks, Investment Banks and Other Banking Institutions) +Bills and Acceptances Payable+ Liabilities to Non-residents	Bank Negara Malaysia	May 2008-June 2015
South Africa	Foreign currency funding to the foreign sector + Loans received under repurchase agreements (domestic and foreign sector, excluding central bank)	South African Reserve Bank	April 2006-March 2015
Turkey	Payables to banks + Repo transactions [See Akdogan and Yildirim (2014) for a detailed definition]	Central Bank of the Republic of Turkey	May 2006-May 2015

Central Bank of the Republic of Turkey

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