

Heterogeneous Bank Lending, Gross Loan Flows, and the Macroeconomy

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Abstract

This paper explores gross loan flows and their interaction with the macroeconomy in emerging markets. Studying gross loan flows in the South Korean loan market during 1984 - 2014, I find that sizable loan expansion and contraction, measured as deviation from the growth trend, coexisted over time, indicating intense heterogeneity in bank lending. The 1997 financial crisis and the subsequent reforms and restructuring of the banking sector well explain changes in gross loan flows in the post-crisis period. Furthermore, gross flows display cyclical patterns, which strengthened after the crisis and reforms, and play a role in transmitting monetary policy shocks.

1 Introduction

The change in aggregate loans are the result of two intrinsically different activities of banks that are expansion of new loans and cancellation of expired loans, as Dell’Ariccia and Garibaldi (2005) point out. When a bank extends loans, due to search frictions in loan markets, it is time-consuming and involves costs for screening and evaluating investment projects and the lender may take credit risks to new loans. On the contrary, when a lender

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contracts loans, it involves information loss, caused by separation of relationship with borrowers, and costs of retrieving loans that may be not trivial, especially in recessions. Therefore, decomposing aggregate net change into two gross loan flows, loan expansion and loan contraction, helps better understanding of heterogeneous bank lending at the micro level and its interaction with the macroeconomy. Indeed, since the recent global financial crisis that has placed bank lending behaviors in the spotlight, several recent studies approach banks' lending behaviors using the gross loan flows, presenting evidence that gross loan flows capture a picture of the bank credit market better than aggregate bank lending or interest rate spread which can not reflect heterogeneous lending behavior at the micro level (Chari, Christiano, and Kehoe 2008; Cohen-Cole et al. 2008; Taylor 2009). Dell'Ariccia and Garibaldi (2005) document stylized facts of gross loan flows from 1979:Q2 to 1999:Q2 using U.S. commercial bank data. Craig and Haubrich (2013) also explore the properties of gross loan flows in the U.S. from 1960 to 2004. Contessi and Francis (2013) investigate how gross loan flows react to adverse shocks in the early stage of the U.S. subprime mortgage crisis and compare the responses with changes in lending behaviors during other recessions.

These inherently different activities of banks - loan expansion and contraction - differ across regulatory stances and financial development. In particular, understanding these two sources determining bank credit lending is important in emerging market economies (EMEs) not only because bank credit is a key external financing source for investment, but also because credit allocation, the result of lending decisions, plays a crucial role in firms' performance and the aggregate economic activity. In the EMEs, search frictions is nontrivial in the immature (or inefficient) loan market, which may result in inefficient loan allocation. With large search frictions inherent to the loan market, loan expansion and loan contraction behave asymmetrically responding to positive or negative economic shocks (Cho 1988, Hwang 2012). In support of this argument, recent theoretical models with search frictions emphasize that while loan expansion increases slowly responding to a positive aggregate shock, loan contraction responds immediately to an adverse shock. (see, e.g., Dell'Ariccia and Garibaldi

1998; Wasmer and Weil 2004). On the other hand, given that the government actively intervenes in banks' loan decisions to achieve the growth of industrial sector in most EMEs, loan expansion and contraction may not follow a usual matching process. Rather, they are largely affected by the government's banking and corporate policy, not by market-oriented lending decisions of individual banks. In this case, loan reallocation, whether inefficient or not, is actually contributed by the government policy and the intensity of loan reallocation is not predictable.

Furthermore, emerging market economies recently experienced banking sector reforms and restructuring that were subsequent to financial crises (e.g., the 1994 Mexican peso crisis, the 1997 Asian financial crisis, the 2001 Argentine debt crisis). Anecdotal evidence shows that during crises, as banks' lending were subject to large financial frictions, net loan aggregates shrank substantially and rapidly. Also, banking sector reforms may cause a temporary or persistent influence on lending behaviors. Indeed, academic and policy studies document effects of policy reforms subsequent to financial crises on banking sectors (e.g., Banker et al. 2010; Borensztein and Lee 2002; Chang 2006; Hyun and Minetti 2014). However, any studies do not examine the impacts of financial crises and reforms on gross loan flows.

This paper takes a step to explore heterogeneous bank lending behaviors and their interaction with the macroeconomy in EMEs. Specifically, I study the lending behavior of the South Korean banking sector during 1984 – 2014 by constructing gross loan flows. The banking industry in South Korea is an ideal testing ground for the research purpose. While the economy grew fast with an annual growth rate of 5.93% during 1984 – 2014, the bank loan market underwent several important policy changes and economic events, such as financial liberalization in 1984 – 1996, the 1997 financial crisis, and banking policy reforms and restructuring during 1998 – 2002. Prior to the financial crisis, financial liberalization policy led the banking industry to grow fast with an aim of financing large and export firms. The government had great influence on credit allocation, which diminished the incentive to monitor and discipline borrowers (Banker et al. 2010; Smith 2000). After the onset of the

crisis, the government implemented severe restructuring of the industry and policy reforms during 1997 – 2002. The financial regulators have kept tight regulatory stance and the government curtailed policy loans to insignificant levels. Consequently, individual banks' lending decisions of banks started to depend on market-based discipline.

These experiences of South Korean banking sector bring out some important questions relevant to gross loan flows: Are gross loan flows sizable at any phase in the business cycle, consistent with the earlier work? If not, how do loan expansion and contraction behave differently in the business cycle? How does gross loan flows respond to the 1997 financial crisis? How do banking industry restructuring affect loan reallocation across lenders? Do gross loan flows exhibit certain cyclical patterns? Do gross loan flows transmit monetary policy shocks? Although many studies examine the behaviors of banking sectors in EMEs and the impacts of financial crises and policy reforms on the sectors, these questions about gross loan flows remain unexplored.

To address these questions, I construct four gross loan flows – loan expansion, contraction, gross loan reallocation, and excess loan reallocation – as well as net loan flow (net growth) using the methodology proposed by Dell'Ariccia and Garibaldi (2005).¹ Given a fast growth of the loan market with annualized rate of 12.34% during the whole sample period (1984 – 2014), gross loan flows are relatively smaller than net loan flow; loan expansion is much larger than loan contraction. However, measuring gross loan flows as deviation from the industry trend, remarkably, loan expansion and contraction are on average 3.04 and 2.97, respectively, that shows sizable intensity of dynamic lending behaviors at the micro level.

I also find evidence that excess loan reallocation is largely driven by the intensity of loan contraction, given large loan expansion. In particular, during recessions and the 1997 financial crisis period, gross loan flows are more sizable than net loan flow, which means that lenders behave heterogeneously during the period. Such heterogeneous lending resulted

¹As Dell'ariccia and Garibaldi (2005) point out, loan reallocation does not measure the exact extent of movement of loans from a bank to another. It captures the heterogeneity of banks' lending behaviors; some banks extend loans to firms while other banks contract loans to other firms.

in large reallocation of loans across banks. Focusing more on the 1997 crisis, shortly after the outbreak of it, loan expansion shrank significantly and loan contraction rose substantially. Then, during the restructuring period between 1998 and 2002, loan expansion and contraction showed sizable intensity, 8.13 and 3.06, respectively. Due to the simultaneous increase in both loan flows, excess loan reallocation across lenders was also substantial (4.46). More importantly, after the banking sector reforms and restructuring, the intensity of loan expansion and contraction diminished to 4.63 and 0.79, respectively, which led excess reallocation to decrease (1.48). A convincing explanation about the reduction in gross flows is that tight bank supervision and lending standards contribute to lesser heterogeneity of lending behaviors in the post-crisis period. This claim is supported by several papers that find herd behavior in banks' loan decisions (Chun and Kwon 2008; Lee 2010).

Gross loan flows by loan category further give more detailed evidence on the patterns of lending behaviors. I investigate sectoral loan flows in two dimensions: domestic currency and foreign currency loans and commercial and individual loans. While domestic currency loan flows exhibit patterns similar to total loan flows, foreign currency loan flows exhibit peculiar behaviors. Different patterns are attributable to the fact that foreign currency loan flows are vulnerable to external shocks, especially exchange rate shocks. For instance, its expansion and contraction substantially react to external shocks in 1997 and 2008.

Turning to the commercial and individual loan flows, new evidence of asset portfolio reallocation emerges. Shortly after the 1997 crisis, unlike commercial loan contraction that soared significantly, individual loan contraction rose just a bit. Furthermore, during 1998 – 2002, individual loan contraction remains at a low level (1.41), while commercial loan contraction is much intense (3.87). Notably, these different patterns indicate that banks reconstruct their portfolio composition in the 1998 – 2002 period. This finding is consistent with the fact that most banks specialized in commercial lending prior to the crisis were acquired or merged into solvent banks, most of which are specialized in retail lending. In addition, this portfolio reallocation partly results from stricter financial supervision on

commercial loans which are more vulnerable to adverse economic shocks and asymmetric information problem. Furthermore, when I compare gross loan flows in this paper with credit flows that measured from the demand side of the loan market, I uncover new evidence of loan reallocation patterns. Hyun and Minetti (2014), using non-financial firm data of South Korea, reveal that credit reallocation across non-financial firms increased after the 1997 crisis due to the increase in credit creation and destruction on the demand side of loan market. Combined with their results, reshuffling loans from corporate sector to individuals, occurred in the supply side of loans, implies that although commercial loan contraction increased with a decrease in loan expansion in the post-crisis period, a lender reallocated loans more frequently from unprofitable firms to profitable firms, which led to intense credit reallocation across firms.

The paper then explores dynamic properties of gross loan flows. Predictably, loan expansion and contraction respectively exhibit procyclical (0.40) and countercyclical (-0.23) behaviors over the whole sample period. Excess loan reallocation displays countercyclicality (-0.17). Importantly, these cyclical patterns strengthened in the post-crisis period, compared to the 1984 – 1996 period. These findings suggest that banks' lending decisions are more responsive to the business cycle after the banking industry reforms in a way that the decisions are more heterogeneous in recessions. Another noteworthy finding is that commercial loan expansion is acyclical (0.04) in the pre-crisis period, suggesting that some lenders extend more loans even in economic downturns.

In addition, the cyclical component of loan contraction is more volatile than that of loan expansion in the post-crisis period, while the opposite is observed in the pre-crisis period. This suggests that, in the post-crisis period, excess loan reallocation is mainly driven by loan contraction, consistent with earlier work on U.S. banks. In support of this evidence, recent credit search theories show that, due to information asymmetry inherent in the loan market, lenders need more time to expand loans in responding to positive economic shocks than contracting loans in response to adverse economic shocks in the pre-crisis period. On the

contrary, banks enabled expanding loans more quickly than contracting loans in recessions. This interesting finding is well explained by the fact that the government intervened in credit allocation before the crisis. Last, I examine whether loan expansion and contraction interact with monetary policy. Several prior studies find that net loan aggregates play a role as lending channel to transmit monetary policy in EMEs. Since net loan aggregates masks two different sources of bank lending behaviors, my hypothesis is that gross loan flows may transmit monetary policy shocks. The results confirm this hypothesis.

The rest of the paper is organized as follows. Section 2 describes the evolution of South Korean banking industry during 1984 – 2014 period. Section 3 presents the data and the methodology used in the article. Section 4 presents basic properties of gross loan flows and examines patterns of loan flows across several loan categories. Section 5 investigates time-series properties of gross loan flows, such as volatility, cyclical, and their interaction with monetary and output shocks. Section 6 concludes.

2 The Banking System in South Korea, 1984 – 2014

This section briefly describes the evolution of South Korean banking industry over the 1984 – 2014 period, focusing on the regulatory changes, the 1997 financial crisis, and the associated reforms that had significant influences on the industry. Since the early 1980's through the early 1990's, the government implemented financial liberalization policy in a gradual manner. Privatization of commercial banks that had been owned by the government agencies was entirely completed during 1982 – 1983 (Cho 1988; Liu and Hsu 2006). In addition, barriers to entry were relaxed and thereby 8 commercial banks were established during 1982 – 1992. The financial liberalization process was accelerated in 1993 when a democratic regime took the reins of power after 32 year-long military regimes. On top of enlargement of the business scope of banks, the new government started to implement more drastic financial deregulation measures to foster market-oriented competition between lenders and allow large firms easy

access to external financing. For instance, regulation measures imposed on large business groups' borrowing were lifted or relaxed since 1993, and, meanwhile, monitoring role of main banks on them was also weakened in 1994 (Bank of Korea 1994). Financial regulations on foreign borrowing had been loosened to enable lenders to extend foreign commercial loans without government approval by 1995, which resulted in the rapid and huge buildup in foreign borrowing, increasing \$44 billion in 1993 to \$120 billion in September 1997 (Chang 2006). Furthermore, the government fostered merchant banking corporations (merchant banks hereafter) following the examples of British merchant banks and U.S. investment banks with an aim of strengthening financial intermediation specialized to large firms and export firms. Merchant banks increased from 6 in 1991 to 30 in 1997 and were mainly engaged in short-term overseas borrowings to finance long-term investments; their outstanding foreign debt rose from \$7.27 billion in 1994 to \$18.62 billion in 1996.

However, while the banking system was under drastic liberalization, weak financial supervision and lack of market discipline and proper risk management of banks led lenders undercapitalized with non-performing loans (NPLs) increasing, and eventually vulnerable to adverse external shocks. As several studies on South Korean banking industry find, lending decisions were largely influenced by the government before the 1997 financial crisis. Such lending practices might lead to modest loan reallocation in the period (see, e.g., Banker, Chang, and Lee 2010; Chopra et al. 2001; Smith 2000).

Shortly after the financial crisis hit the economy in December 1997, the government with the guideline proposed by the IMF implemented regulatory reforms and restructuring on the banking sector.² Insolvent lenders were bankrupt and liquidated or acquired and merged. Severe banking sector restructuring was implemented in two stages lasted to 2002 (the first stage restructuring ended in 1999) and, in the result, the numbers of commercial banks, merchant banks and savings banks reduced from 33, 30, and 231 in December 1997 to 23, 10, and 186 in 1999 to 19, 3, and 117 in December 2002 (Bank of Korea 1999, 2002). The

²For more detail on the causes and effects of the 1997 financial crisis, refer to Hahm and Mishkin (2000) and Chopra et al. (2001).

BIS capital ratio increased from 7.04 in December 1997 to 11.33 in December 2002. After the banking sector restructuring finalized, the banking sector maintained its soundness and kept resilient amidst the global financial crisis, with the BIS capital ratio of 12.31 and ratio of NPLs to total loans of 1.14% at the end of 2008.³

BeginExpansion intervention in credit decisions hampered the development of strong risk management. / structural weakness / over-leveraged corporate firms/ limited ability to assess financial risks/ the sudden reversal of capital flowsEndExpansion

3 Data and Methodology

3.1 Data

Bank-level balance sheet data come from the two data sources. First, I collect the data from 1999 to 2014 from Financial Statistics Information System (<http://fisis.fss.or.kr>) to which the Financial Supervisory Service (FSS) reports key financial data collected from the financial firms under its supervision. Since the FSS was established in 1998, the source does not provide financial data prior to 1999. Thus, I obtain financial information between 1983 to 1998 from KISLINE, the data source provided by the largest and oldest credit rating agency, National Information and Credit Evaluation (NICE). This data source provides semiannual reports of commercial banks, merchant banks, and saving banks. This source also includes information about establishment and closing dates and history of mergers and acquisitions during 1983 – 2014. When I find that reports for some banks are missing in both sources, I fill the missing data by utilizing printed reports. The dataset contains 32 commercial banks, 32 merchant banks, and 187 savings banks. Postal bank is dropped from the dataset because it is not regulated by the financial regulator and savings banks operated less than 2 years

³As the real estate and construction sector suffer considerable negative effects of the 2008 recession, many savings banks who extended a large portion of loans to project financing were bankrupt during 2009 – 2012. However, since they accounted for small portion of the banking industry, their impact on the banking sector is limited and the banking sector kept stable.

are omitted from the dataset. I include merchant banks and savings banks in this analysis in order to get entire picture of loan markets. Above all, huge foreign lending by merchant banks was widely acknowledged as one of the main causes of the 1997 financial crisis. And in the post-crisis period when commercial banks are subject to strict financial supervision and tight lending standards, savings banks act like regional banks in the post-crisis period to meet loan demand of small and medium-sized firms with relatively low creditworthiness and short credit history. Thus, excluding them may lead to misleading results. 5 types of loans are available in the dataset; on top of total loans, the dataset contains bank-level domestic currency loans, foreign currency loans, commercial loans, and individual loans. As lenders' costs of loanable funds, credit risks, borrowers' characteristics differ across loan types, sectoral gross loan flows may behave heterogeneously responding to economic shocks. Therefore, the availability of sectoral loan data allows us to better understand heterogeneous bank lending and gross loan flows. The sample period ranges from 1984 to 2014, in which the 1997 financial crisis and the subsequent banking sector reforms are in the middle of the period.⁴ This feature of the data enable us to explore how loan flows respond to the financial crisis and the reforms in the short and long run and compare it with responses to other recessions. Data are available at the semiannual frequency, except for quarterly data for commercial banks during 1999 to 2014. Therefore, I mostly work with the semiannual data, but also use quarterly data for commercial banks to explore time-series properties of gross loan flows.

3.2 Methodology

I aggregate bank-level loans to construct gross loan flows, such as loan expansion, loan contraction, gross loan reallocation and excess loan reallocation, as well as net loan growth (net loan flow), following the methodology proposed by Dell'Ariccia and Garibaldi (2005). They adapt the methodology, suggested by Davis, Haltiwanger, and Schuh (1996) for measuring

⁴Individual loan data of individual loans are available from 1993 to 2014.

job reallocation, by reflecting measurement issues for loan flows. In order to aggregate bank-level loans, I compute a loan growth rate (g_{it}) for bank i in time t by dividing the loan change between time t and time $t - 1$ by the simple average of loans during the two periods. The growth rate is formally expressed:

$$g_{it} = (l_{i,t} - l_{i,t-1}) / 0.5(l_{i,t} + l_{i,t-1}) \quad (1)$$

TCIMACROBeginExpansion where $l_{i,t}$ denotes outstanding value of loans extended by bank i in time t . To adjust the potential bias caused by mergers and acquisitions, I reflect these event for mergers' (or acquirers') loan changes as $l_{i,t} - l_{i,t-1} - l_{j,t-1}$. With this adjustment, a merger i 's loan change exactly catches the change in loans due to its own lending activity and due to the merger. For merged bank j , $l_{j,t}$ is zero and hence their growth rate is -2 because they disappear at time t . Then we sort banks into two groups: one with positive growth rates and the other with negative growth rates. Loan expansion (POS_t) at time t , as presented in Equation (2), is constructed by aggregating positive loan growth rates of individual banks with putting weights of the banks' loan market shares on banks' loan growth rates. Likewise, loan contraction (NEG_t) at time t is calculated, as shown in Equation (3), as the sum of absolute values of negative loan growth rates of individual banks with placing individual banks' relative loan size on the corresponding growth rates.

$$POS_t = \sum_{i=1}^N |g_{it}| \frac{0.5(l_{i,t} + l_{i,t-1})}{\sum_{i=1}^N l_{i,t-1}} \quad (2)$$

$$NEG_t = \sum_{i=1}^N |g_{it}| \frac{0.5(l_{i,t} + l_{i,t-1})}{\sum_{i=1}^N l_{i,t-1}} \quad (3)$$

Net loan growth (NET_t) is simply calculated as loan expansion minus loan contraction. While net loan growth provides useful information about loan market dynamics, it masks true dynamics and dynamism in loan markets because it average individual banks' loans out to present net changes in the aggregate level of bank loans. Particularly, it does not reflect

(is silent about) the heterogeneity in loan markets. Gross loan reallocation, which measures heterogeneity in lending behaviors at the micro level, is defined as the sum of loan expansion and contraction. The other loan reallocation measure is excess loan reallocation (EXC_t) that is calculated by gross loan reallocation less the absolute value of net loan growth.

$$NET_t = POS_t - NEG_t \quad (4)$$

$$SUM_t = POS_t + NEG_t \quad (5)$$

$$EXC_t = SUM_t - |NET_t| \quad (6)$$

Excess loan reallocation measures loan reallocation caused by simultaneous loan expansion and contraction, while gross loan reallocation changes not only due to net loan changes but also simultaneous changes in loan expansion and contraction. Thus, excess loan reallocation better measures a real extent of loan reallocation occurred in loan markets when either of loan expansion or contraction is disproportionately large. For example, suppose that loan expansion and contraction are respectively 8% and 1%. With high loan growth, actual loan reallocation is small, but gross loan reallocation is 9%, which gives us wrong information about loan reallocation. On the other hand, excess loan reallocation is 2%, which represents the actual magnitude of reallocation of loans across banks. Like this, when loan expansion is disproportionately larger than loan contraction, excess loan reallocation better captures real heterogeneity in bank lending. South Korean loan market experienced a fast growth with an annual growth rate of 14.32% over the sample period, which implies a disproportionate intensity of loan expansion and contraction. Therefore, I focus on excess loan reallocation instead of gross loan reallocation.⁵ Furthermore, following Dell’Ariccia and Garibaldi (2005), I construct idiosyncratic loan expansion (\widehat{POS}_t) and contraction (\widehat{NEG}_t), each of which indicates loan creation and shrink relative to the industry loan growth trend. By measuring loan creation and destruction as a deviation from the trend, these flows better capture

⁵See Davis, Haltiwanger, and Schuh (1996) and Dell’Ariccia and Garibaldi (2005) for more details on the methodological issues.

heterogeneous lending behaviors of banks irrespective of high growth trend, as Dell’Ariccia and Garibaldi (2005) and Contessi and Francis (2013) point out. To do so, I adjust individual banks’ loan growth rate using Hodrick-Prescott (HP) filtered industry-level loan growth rate as the industry trend.⁶ Then, I calculate the rest of idiosyncratic loan flows according to the procedure presented above: idiosyncratic loan reallocation (\widehat{SUM}_t), net growth (\widehat{NET}_t), and excess reallocation (\widehat{EXC}_t). Following the literature, excess loan reallocation is used as the measure of loan reallocation for nominal loan flows, while gross loan reallocation is used for idiosyncratic loan flows. Also, I rely on nominal flows for exploring dynamic properties.

4 Gross Loan Flows, 1983 to 2014

This section documents basic properties of nominal and idiosyncratic gross loan flows, particularly focusing on their responses to the 1997 financial crisis and the associated restructuring.

4.1 Nominal and Idiosyncratic Gross Loan Flows

Figure 1 plots nominal and idiosyncratic loan expansion (solid lines) and contraction (dashed lines), constructed from total loans, along with recession periods (vertical shaded lines) between 1984 and 2014. Table 1 summarizes average values and coefficients of variation of loan flows over several periods (1984 to 2014, 1984 to 1996, 1998 to 2002, and 2003 to 2014). The 1984 – 1996 and 1998 – 2002 periods respectively correspond to the pre-crisis period and the restructuring period. The post-crisis period spans from 2003 to 2014. Starting with nominal gross loan flows, upper panel of figure 1 shows that while loan expansion has a slowly downward trend during the sample period, it is larger than contraction in most periods except the 1997 financial crisis and the subsequent bank industry restructuring period: average loan expansion and contraction are 7.47 and 1.48 during the whole sample period, respectively. Loan contraction, although it remains at a relatively low level, also

⁶I set 100 and 1600 as a standard parameter to obtain detrended series for semiannual and quarterly data, respectively (Ravn and Uhlig 2002).

exhibits a dynamic behavior before 1997 that turned moderate (or mild) in the 2000's through the 2010's. These disproportionate magnitudes of two gross loan flows mirrors that the South Korean loan market grew fast with an average net growth of 5.99 (annualized rate of 12.34). Reader may wonder whether large loan expansion in the pre-crisis period results from new establishment of lenders. Excluding the first observation for each bank when a bank is newly established, the changes in loan flows are negligible: for instance, .

[Figure 1] [Table 1]

Excess loan reallocation is on average 2.60 over the whole sample period. This flow indicates the extent how much bank credit is reshuffled across lenders in a given period.⁷ Large loan expansion and small loan contraction result in moderate excess loan reallocation in most periods in South Korean loan market. This is a predictable result in EMEs in which bank credit market is fast growing. Compared to earlier studies, the magnitude of excess reallocation in South Korea is smaller than those (5.45 during 1979:Q2 – 1999:Q2 and 5.35 during 1999:Q1 – 2008:Q2) observed in U.S. banks.⁸ Importantly, this difference stems from relatively small loan contraction. Loan expansion is similar to those of the U.S. cases (6.46 during 1979:Q2 – 1999:Q2 and 8.99 during 1999:Q1 – 2008:Q2). But loan contraction is quite smaller in South Korea than in the U.S. (2.86 during 1979:Q2 – 1999:Q2 and 2.66 during 1999:Q1 – 2008:Q2). Since excess loan reallocation measures the magnitude of simultaneous change in loan expansion and contraction, small loan contraction results in modest excess loan reallocation. Focusing on a period around the 1997 financial crisis, loan expansion is steadily large, around 9.06%, during 1993 and 1997; however, shortly after the onset of the crisis (December 1997), the expansion shrinks sharply and loan contraction bounds significantly. As the economy recovered between 1998 and 1999, loan expansion continuously rise and reaches a level prior to the crisis while loan contraction remains at a high level; loan contraction is on average

⁷Loan reallocation does not necessarily measure the exact extent of movement of loans from a bank to another. Rather, it captures the heterogeneity of banks lending behaviors; some banks extend loans to firms or individuals while others contract loans.

⁸The semiannual values that are presented here are converted by the author using average quarterly excess reallocation rates produced by Dell’Ariccia and Garibaldi (2005) and Contessi and Francis (2013).

7.88 during 1998:H1 and 1999:H1 and drops to 0.48 in 1999:H2 when the first stage of the bank restructuring is finalized. I further investigate whether gross loan flows exhibit different patterns before and after the crisis period because many studies show evidence that the subsequent reforms implemented in the economy caused structural changes in corporate and financial sectors. Loan expansion reduces from 9.80 in the pre-crisis period to 4.63 in the post-crisis period and loan contraction also decreases from 1.39 to 0.79. Therefore, excess reallocation also becomes less intense in the post-crisis period (1.48), compared to the pre-crisis period (2.78), suggesting that heterogeneity in lending decisions is mitigated after the financial crisis and banking sector restructuring. One possible explanation is that tight bank supervision and strict lending standards after the crisis contribute to the reduction in the heterogeneity of bank lending behaviors. Banking regulations universally applied to banks led lending standards similar, which results in modest excess reallocation. Supporting this claim, Chun and Kwon (2008) and Lee (2010) find evidence of herd behavior in bank lending in the post-crisis period, which explains the decrease in excess loan reallocation. Turning to idiosyncratic loan flows, several important findings emerge. First of all, while loan expansion is on average 3.04, remarkably, loan contraction is sizable, 2.97. This finding suggests that many lenders expand and contract loans, deviating from the industry trend over time (see Table 1). Next, loan reallocation is sizable, 6.01, indicating that banks' lending is quite heterogeneous when controlling for the increasing trend. Again, loan reallocation is larger, 6.97, in the pre-crisis period than, 3.78, in the post-crisis period, which confirm the reduction in heterogeneity of bank lending.

4.2 Gross Loan Flows by Loan Categories

In this section, I investigate sectoral gross loan flows by breaking loans down to loan categories to further illustrate heterogeneous bank lending. In so doing, I seek answers for several questions about changes in gross loan flows: are the patterns of gross loan flows similar across loan categories? Or do they exhibit heterogeneous patterns? How does each sectoral flow

respond to the financial crisis? I investigate patterns of sectoral loan flows in two dimensions: domestic currency vs. foreign currency loans and commercial vs. individual loans. Since individual loan data are available from 1993:H2, individual loan flows start from 1994:H1. Upper two panels of figure 2 depict nominal gross flows of domestic and foreign currency loans. Domestic currency loan expansion and contraction exhibit more volatile, but similar patterns to total loans'. On the contrary, foreign currency loan flows show idiosyncratic behaviors. Particularly, after the outbreak of the 1997 financial crisis, its expansion plunges and remains a modest level until 2004, while its loan contraction rises sharply and keeps persistent at a high level until 2002:H2 when it lowers below loan expansion. Reflecting these behaviors, excess reallocation surges from 0.48 (1994:H2 – 1997:H1) to 6.33 (1998:H1 – 1999:H1). Furthermore, when adverse external shocks hit the economy in the second half of 2008, loan expansion increases significantly. In 2009, a spike in loan contraction, concurrent with a sharp drop in loan expansion, follows the economic recovery, while such significant changes are not observed in domestic currency loans. Considering that South Korean economy is small open economy and its economic growth is driven by exports, foreign currency loan flows are sensitively responding to adverse external shocks which have relatively a little influence on domestic currency flows. Another notable finding is the increase in loan contraction even after the crisis and reform period. This is mainly due to tight regulation on foreign currency loans quality, such as short-term foreign currency liquidity ratio and maturity gap ratio, implemented during the banking reforms subsequent to the crisis. Consequently, the rise in loan contraction drives excess loan reallocation intense in the post-crisis period (see Table 2). Comparing commercial and individual gross loan flows provides new evidence on banks' asset portfolio reallocation and loan reallocation associated with the 1997 financial crisis. Commercial loan expansion and contraction show high volatility in the 1980's, but exhibit much smoother behaviors, in the post-crisis period, that likely respond regularly to economic fluctuations (see Figure 2). Generally, the pattern of their gross loan flows is quite similar to gross flows of total loans.

[Figure 2] [Table 2]

In contrast, gross flows of individual loans show different patterns. First, individual loan expansion was decreasing during 1993 – 1997 when commercial loans expanded fast. Second, individual loan contraction experienced only a mild increase shortly after the crisis, contrary to significant contraction of commercial loans. Due to modest loan contraction (0.49) in the restructuring period, net growth of individual loans is quite high (13.85), compared to commercial loan growth (3.47). In the result, excess reallocation of individual loans is only 2.11, just a third of the same measure of commercial loans (6.40). Remarkably, these findings imply that bank portfolio reallocation existed in this sub-period. Idiosyncratic flows of both loan types also confirm this portfolio composition effect. Measured as deviation from the industry trend, net flow of individual loans is positive (1.36) in the post-crisis period, while that of commercial loans is negative (-3.24). Together with these different detrended loan growth rates, disproportionate intensity of loan reallocation (3.38 for individual loans and 7.46 for commercial loans) demonstrates portfolio reallocation from commercial sector to individual customers. What causes such a reshuffling of loans across loan categories? One convincing explanation is that most banks specialized in commercial lending underwent severe asset restructuring after the crisis, which led to commercial loan contraction, and that they were merged into solvent banks, most of which are specialized in retail lending. Indeed, individual loan expansion increases substantially (15.25) during 1998 – 2002 and, although it decreases in 2003:H1, its intensity remains around 10% until 2006:H2. The change in regulatory attitude is another cause. Since regulation on commercial loans tightened after the crisis and commercial lending is more vulnerable to financial frictions and asymmetric information between lenders and borrowers, banks are more exposed to credit risks than when they extend individual loans. Therefore, banks contract loans to corporate sector and extend loans to individual customers.

[Table 3]

4.3 Inter-bank and Inter-firm Loan Reallocation

Credit flows can be measured from the demand and the supply sides of the loan market. Credit reallocation across firms and commercial loan reallocation across banks, although both of them measures heterogeneity in the bank credit market, have different information on the market. To be specific, when a bank withdraws loans from a firm and then extends them to another firm, this behavior induces credit reallocation across firms, not loan reallocation across banks. On the other hand, if a firm ends a loan contract with a bank and finances funds from another lender, this behavior induces loan reallocation across banks. Therefore, although both concepts measure heterogeneity inherent in the loan market, their behaviors can differ because different factors affect the demand side and the supply side of loan markets, as Herrera et al. (2011) point out. Examining the patterns of gross loan flows together with inter-firm credit flows provides deep insight into bank lending behaviors. To compare gross loan flows with credit flows observed in Hyun and Minetti (2014), I use year-on-year gross loan flows because credit flows have an annual frequency and I adjust the sample period from 1984 to 2012 because credit flows end in 2012. Note that due to measurement issues, a simple comparison has several pitfalls.⁹ For example, comparing the intensity between gross loan flows and credit flows may deliver misleading information. Year-on-year excess reallocation of commercial loans increased from 0.80 in the pre-crisis period to 2.29 in the post-crisis period. This increase is attributable to the rise in loan contraction (from 0.40 to 1.15). Similarly, Hyun and Minetti (2014) find evidence that inter-firm excess reallocation increased 15.89 in the pre-crisis period to 29.31 in the post-crisis period. Also, the increase is due to a substantial and persistent increase in credit destruction (8.50 to 17.19) and the rise in credit creation (from 16.64 to 22.64).¹⁰ The similar results suggest that in the pre-crisis period, due to prevalent rollovers of bank credit and lack of monitoring and market discipline,

⁹Credit flows are constructed from real loan values, deflated nominal loans by GDP deflator every year. Also, The definition of loans used in credit flows cover borrowings from all financial institutions and non-financial institutions, except trade credit.

¹⁰Credit creation and destruction, measured from the demand side of loan markets, respectively correspond to loan expansion and contraction.

commercial loan contraction was small. Furthermore, the increase in both credit creation and destruction (demand side), combined with the increase in loan contraction (supply side), delivers new evidence that while banks adjust asset portfolio between commercial loans and individual loans, each bank extend and contract commercial loans from unprofitable or risky firms to profitable or financially healthy firms on an ongoing basis. In other word, reshuffling of commercial loans within a bank is quite intense.

5 Gross Loan Flows and the Macroeconomy

Bank credit is not only an important external financing sources for businesses to raise funds for investment, but it is also a key channel to propagate economic and monetary policy shocks. Dell’Ariccia and Garibaldi (2005) find evidence about cyclical properties of loan flows and Craig and Haubrich (2013) reveal that gross loan flows and the federal funds rate interact with each other. However, as macroeconomics literature documents, business cycles in EMEs have different properties from those observed in developed economies (Aguiar and Gopinath 2007; Álvarez-Parra et al. 2013; Boz, Daude, and Durdu 2011). Several studies on monetary policy in EMEs emphasize that inflation targeting in EMEs underperforms due to volatile macroeconomic environment, high vulnerability to external shocks, and low credibility (e.g., Fraga, Goldfajn, and Minella 2003; Taylor 2014). Likewise, dynamic properties of loan flows in EMEs may show different features that are not observed in advanced economies. To shed light on the dynamic behaviors of loan flows in EMEs, this section studies whether and how gross loan flows interact with the aggregate economic activity and monetary policy. I also examine possible changes in the cyclical patterns of loan flows before and after the financial crisis period.

5.1 Cyclical Properties

Cyclical components of all loan flows are obtained following Dell’Ariccia and Garibaldi (2005). After obtaining loan expansion and contraction in levels at time t , calculated by multiplying each of them by aggregate loans at time $t - 1$, I detrended the logged values of them using a Hodrick-Prescott (HP) filtering procedure. Then the cyclical components are calculated as the deviation of HP-filtered values from corresponding logged values. Table 3 reports the correlation coefficients of loan flows with cyclical component of GDP.¹¹ Starting from total loan flows, loan expansion and contraction are procyclical (0.40) and countercyclical (-0.23), respectively. Excess loan reallocation and aggregate loans respectively display countercyclical (-0.17) and procyclical (0.17) properties, consistent with the prior studies on the U.S. banks. The countercyclicity of excess loan reallocation implies that individual banks’ lending behaviors are relatively homogeneous in economic expansions, but they turn more heterogeneous in recessions. In addition, countercyclical loan contraction is consistent with an expectation that banks reduce credit to unprofitable firms to avoid deteriorating their asset quality in economic downturns. Interesting findings emerge when I break down the total sample period into two sub-periods before and after the financial crisis. First, the extent of cyclicity of gross loan flows strengthen after the banking sector restructuring subsequent to the crisis. Cyclicity of loan expansion, contraction, and excess loan reallocation is intensified to 0.31, -0.42, and -0.43, respectively. This finding implies that banks’ lending decisions is more responsive to the business cycle in a way that the decisions become more heterogeneous in recessions, compared to expansions. Arguably, this stronger cyclicity is attributable to the banking industry reforms and restructuring, subsequent to the crisis, which changed banks sensitive to financial risks and to meet regulatory ratios. Another interesting finding is that a contemporaneous correlation of net loan flow with GDP turns weakly negative (-0.20) after the crisis from positive (0.19) prior to the crisis, largely attributable to countercyclical net flows of commercial and foreign currency loans (see table

¹¹I use real GDP, but the results with nominal GDP are qualitatively same.

3). GDP is positively correlated with lagged net flows and negatively correlated with leads of net flows, which the same patterns are found in loan expansion. On the contrary, lagged loan contraction and excess reallocation are countercyclical, while leads are procyclical. Turning to sectoral loans, All in all, their cyclical properties are similar to those of total loans. However, there are several noteworthy different patterns. First, commercial loan expansion seems acyclical (0.04) in the pre-crisis period, suggesting that some banks expands credit even in recessions. Also, foreign currency loan flows show idiosyncratic cyclical patterns in the post-crisis period. Its excess reallocation is procyclical (0.41), suggesting that banks' lending behaviors at the micro level are more diverse in economic expansions, while the opposite is true in recessions. In addition, the net aggregate of foreign currency loans is countercyclical (-0.42) mainly due to procyclical loan contraction (0.34). Furthermore, this procyclicality of loan contraction is more intense than that of loan expansion (0.13). Bottom right panel of Figure 2 confirms procyclical patterns of loan contraction in the period. During the 2008 recession, foreign currency loan contraction remained at a lower level and thereafter it rose sharply in 2009:H1 when the economy was recovering from the recession. In fact, this cyclical pattern in this period is largely attributable to the government policy to stabilize the foreign exchange market and to provide foreign currencies for importing commodities and raw materials during the recession. When I recalculate correlation coefficients of foreign currency loans excluding observations in 2008, correlation coefficients for excess loan reallocation and aggregate loans lessen to 0.186 and -0.226, respectively. I check the robustness of the results of cyclicity using a VAR approach, proposed by Den Haan (2000), which confirm cyclical patterns presented here.¹²

[Table 4]

¹²I use quarterly commercial bank data between 2000:Q1 to 2014:Q4. In doing so, I include M2, the call rate, and Korean Won exchange rate against the U.S. dollar in the VAR in order to control for them, all of which are endogenous to the relationship between loan flows and GDP. The results are available from the author. For more details on the methodology, refer to Den Haan (2000).

Before moving to the next subsection, it is worthwhile to examine volatility of loan flows. The cyclical component of loan contraction (36.74) is more volatile than that of loan expansion (22.74), consistent with prior studies. Dividing the whole sample period into sub-periods based on the 1997 financial crisis, loan expansion (32.00) is slightly more volatile than loan contraction (29.79) in the pre-crisis period, this relationship is flipped with 20.64 for loan expansion and 29.39 for loan contraction in the post-crisis period. Remarkably, this reversed relationship of relative volatility suggests that countercyclicality of excess reallocation is driven by the cyclical volatility of loan contraction in the post-crisis period, while it is relatively less attributable to movement of loan contraction in the pre-crisis period. Credit search theories provide a useful interpretation on this finding. Dell’Ariccia and Garibaldi (1998), Wasmer and Weil (2004), and Den Haan, Ramey, and Watson (2003) show that, due to information asymmetry on the demand and supply sides of the loan market, it is harder for lenders to expand loans in response to positive economic shocks than contracting loans in recessions. These responses of lenders to economic shocks explain why countercyclical loan contraction is more volatile than procyclical loan expansion. Notably, the opposite extents of volatility found in the pre-crisis period is explained by the fact that loan allocation was largely influenced by the government. Due to the government’s intervention in credit allocation, banks expand loans to borrowers quickly according to the government directions responding to positive shocks and they did not need to contract loans immediately when adverse shocks come, which led to more volatile loan expansion and less volatile contraction.

5.2 Interaction with Monetary Policy

Prior studies on monetary policy in EMEs, such as South Korea, Indonesia, and Turkey, find evidence that net loan flow plays a role in monetary policy transmission (see, e.g., Brooks 2007; Ferri and Kang 1999; Zulkhibri 2013). It raises a relevant question: how do gross loan flows interact with monetary policy. To answer the question, following Craig and Haubrich (2013), I set up a VAR adding real GDP, CPI, commodity prices, the call interest rate,

and loan expansion (or contraction) in standard order and examine impulse responses.¹³ Quarterly gross loan flows are calculated using quarterly bank loan data from 2000:Q1 to 2014:Q4 and the number of lags are selected using Akaike information criterion (AIC). To save space, I report the results of total loans. Figure 3 shows impulse responses between gross (or net) loan flows and call rates or real GDP. First, the call rate affects loan expansion negatively and loan contraction positively, respectively. Their responses are immediate and the impact on loan contraction is relatively more short-lived, vanishing 2 quarters after a monetary shock comes. Next, the call rate responds positively to loan expansion dampening loan expansion, while its response to loan contraction seems ambiguous. Third, real GDP and loan expansion affect positively each other, whereas real GDP and loan contraction do not affect each other. Consistent with earlier work, I find that the net flow responds to GDP and monetary policy shock and has influence on GDP and the call rate. However, since the net loan flow obscures the inherently different two sources of lending activities, loan expansion and contraction, given the findings that loan expansion and contraction evidently interact to monetary policy, gross loan flows, rather than net aggregates seem more relevant lending channel to propagate monetary policy to the economy.

[Figure 3]

6 Conclusion

This paper studies the patterns of gross loan flows and their interaction with the macro-economy using the South Korean loan market from 1984 to 2014. In particular, I focused on finding evidence of whether and how relevant factors, such as regulatory attitude, lending standards, the 1997 crisis and restructuring, had influence on banks' lending behaviors. changes in the patterns of gross loan flows The banking industry in South Korea experienced

¹³Real GDP is followed by CPI, commodity prices, the call rate, and a gross loan flow (Christiano, Eichenbaum, and Evans, 1999).

several important policy changes and the 1997 financial crisis, which are relevant to gross loan flows.

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TABLE 1

Loan Flows

		NET	POS	NEG	SUM	EXC
Total Period: 1984 – 2014						
Nominal Flows	Average	5.992	7.473	1.480		2.602
	Variance	0.796	0.562	1.204		1.033
Idiosyncratic Flows	Average	0.075	3.043	2.968	6.011	
	Variance	3.788	0.775	0.845	0.511	
Sub-Period: 1984 – 1996						
Nominal Flows	Average	8.403	9.795	1.392		2.784
	Variance	0.582	0.458	0.938		0.938
Idiosyncratic Flows	Average	0.040	3.502	3.462	6.965	
	Variance	4.401	0.770	0.709	0.391	
Sub-Period: 1998 – 2002						
Nominal Flows	Average	5.073	8.128	3.055		4.456
	Variance	1.081	0.383	0.985		0.924
Idiosyncratic Flows	Average	-0.206	4.103	4.309	8.412	
	Variance	4.596	0.458	0.828	0.402	
Sub-Period: 2003 – 2014						
Nominal Flows	Average	3.840	4.629	0.789		1.478
	Variance	0.742	0.503	0.835		0.730
Idiosyncratic Flows	Average	0.253	2.016	1.763	3.778	
	Variance	2.615	0.893	0.654	0.401	

Notes: Coefficients of variance are standard deviation over average, except for idiosyncratic net flows, whose coefficients of variance are standard deviation.

TABLE 2

Domestic and Foreign Currency Loan Flows

		Domestic Currency Loans					Foreign Currency Loans				
		NET	POS	NEG	SUM	EXC	NET	POS	NEG	SUM	EXC
Total Period: 1984 to 2014											
Nominal Flows	Average	6.339	7.335	0.995		1.869	3.887	8.316	4.429		2.270
	Variance	0.744	0.584	1.742		1.538	3.376	1.020	1.537		1.066
Idiosyncratic Flows	Average	0.019	2.925	2.906	5.832		-2.479	4.506	6.985	11.491	
	Variance	4.529	0.929	1.215	0.745		4.678	1.296	1.158	0.700	
Sub-Period: 1984 to 1996											
Nominal Flows	Average	8.056	9.099	1.043		2.059	9.125	11.327	2.202		2.463
	Variance	0.623	0.498	1.340		1.314	1.191	0.796	1.403		1.165
Idiosyncratic Flows	Average	0.460	3.227	2.768	5.995		-0.274	4.403	4.678	9.081	
	Variance	4.479	0.899	0.888	0.497		33.042	1.163	1.189	0.624	
Sub-Period: 1998 to 2002											
Nominal Flows	Average	6.857	9.192	2.334		6.857	-4.675	4.908	9.584		1.507
	Variance	0.893	0.437	1.282		0.639	3.385	2.226	0.730		1.164
Idiosyncratic Flows	Average	-1.194	5.110	6.303	11.413		-9.043	5.396	14.439	19.835	
	Variance	7.749	0.622	0.897	0.430		1.700	1.812	0.503	0.391	
Sub-Period: 2003 to 2014											
Nominal Flows	Average	4.221	4.495	0.274		0.548	3.298	6.538	3.240		2.313
	Variance	0.558	0.490	1.043		1.043	2.842	1.031	1.104		0.917
Idiosyncratic Flows	Average	0.148	1.506	1.358	2.864		-0.881	4.252	5.132	9.384	
	Variance	1.923	0.632	1.203	0.647		9.602	1.269	0.885	0.564	

Notes: Coefficients of variance are standard deviation over average, except for idiosyncratic net flows, whose coefficients of variance are standard deviation.

TABLE 3

Commercial and Individual Loan Flows

		Commercial Loans					Individual Loans				
		NET	POS	NEG	SUM	EXC	NET	POS	NEG	SUM	EXC
Total Period: 1984 to 2014											
Nominal Flows	Average	5.367	6.901	1.533		2.769	7.968	8.232	0.991		1.790
	Variance	0.829	0.512	1.395		1.052	0.982	0.875	1.318		1.186
Idiosyncratic Flows	Average	-0.505	3.336	3.840	7.176		0.908	3.391	2.483	5.874	
	Variance	4.767	0.779	0.962	0.593		4.538	1.082	1.037	0.754	
Sub-Period: 1984 to 1996											
Nominal Flows	Average	6.970	8.074	1.104		2.208	12.138	9.998	1.860		3.720
	Variance	0.590	0.435	0.941		0.941	0.562	0.494	1.011		1.011
Idiosyncratic Flows	Average	0.117	3.762	3.645	7.408		3.558	7.267	3.709	10.975	
	Variance	4.950	0.840	0.770	0.451		6.009	0.694	0.785	0.513	
Sub-Period: 1998 to 2002											
Nominal Flows	Average	3.473	7.346	3.873		6.400	13.848	15.252	1.405		2.107
	Variance	1.568	0.415	0.984		0.636	0.760	0.614	1.197		0.840
Idiosyncratic Flows	Average	-3.239	4.223	7.461	11.684		1.361	4.741	3.380	8.121	
	Variance	6.494	0.547	0.750	0.477		6.640	0.768	1.121	0.411	
Sub-Period: 2003 to 2014											
Nominal Flows	Average	4.578	5.407	0.829		1.562	3.639	4.133	0.494		0.988
	Variance	0.832	0.619	0.801		0.686	0.531	0.441	0.783		0.783
Idiosyncratic Flows	Average	0.188	2.430	2.241	4.671		-0.202	1.424	1.626	3.050	
	Variance	2.911	0.718	0.784	0.414		1.599	0.656	0.683	0.422	

Notes: Coefficients of variance are standard deviation over average, except for idiosyncratic net flows, whose coefficients of variance are standard deviation. Individual loan flows start from 1994:H1.

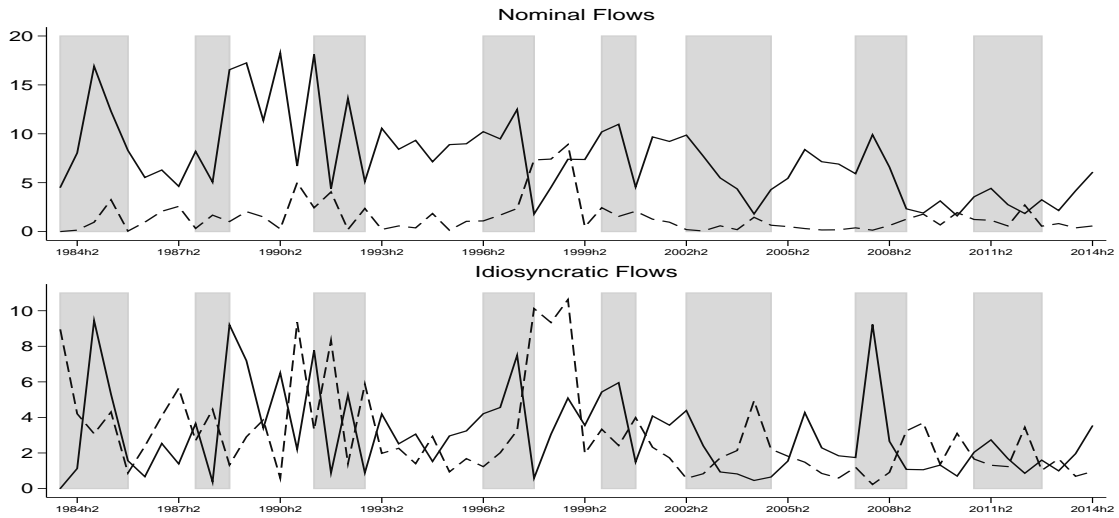
TABLE 4

Coefficients of Correlation

	Coefficients of Correlation																	
	Total Period:1984-2014						Sub-Period: 1984-1996						Sub-Period: 2003-2014					
	Variance	X(-2)	X(-1)	X	X(+1)	X(+2)	Variance	X(-2)	X(-1)	X	X(+1)	X(+2)	Variance	X(-2)	X(-1)	X	X(+1)	X(+2)
Total Loans																		
Aggregate	34.203	0.284*	0.338*	0.168	-0.127	-0.214	39.011	-0.188	0.041	0.190	0.208	0.149	13.949	0.438*	0.219	-0.262	-0.519*	-0.374
POS	22.739	0.096	0.342*	0.399*	0.097	-0.076	31.996	-0.024	-0.015	0.023	0.145	0.090	-20.620	0.291	0.499*	0.314	-0.101	-0.195
NEG	-36.741	-0.053	-0.193	-0.225	-0.092	-0.033	-29.792	-0.126	-0.112	-0.135	-0.046	-0.067	-29.393	-0.198	-0.549*	-0.420*	-0.023	0.081
EXC	-54.038	-0.067	-0.176	-0.169	-0.057	-0.021	-38.081	-0.120	-0.102	-0.124	-0.032	-0.053	-17.752	-0.207	-0.573*	-0.429*	-0.028	0.076
Domestic Currency Loans																		
Aggregate	16.823	0.273*	0.383*	0.253*	-0.007	-0.185	28.874	-0.275	-0.034	0.169	0.245	0.222	10.410	0.529*	0.255	0.149	-0.399	-0.456*
POS	28.853	0.090	0.234	0.328*	0.171	-0.078	51.418	-0.0761	-0.133	0.105	0.061	0.047	-15.665	0.452*	0.448*	0.328	-0.058	-0.216
NEG	89.748	-0.210	-0.250*	-0.132	-0.073	0.174	40.008	-0.040	0.057	-0.177	0.083	-0.022	-9.316	-0.303	-0.377	-0.097	-0.048	0.001
EXC	78.309	-0.206	-0.245	-0.127	-0.071	0.175	37.622	-0.039	0.059	0.181	0.087	-0.016	-9.308	-0.300	-0.375	-0.094	-0.049	-0.001
Foreign Currency Loans																		
Aggregate	-9.022	0.232	0.047	-0.229	-0.408*	-0.300*	-15.156	0.007	0.157	0.176	0.075	-0.047	-202.006	0.429*	0.073	-0.417*	-0.483*	-0.213
POS	95.369	0.311*	0.283*	0.130	-0.108	-0.075	14.238	0.205	0.347	0.367	0.347	0.281	200.202	0.362	0.3796	0.133	-0.167	-0.118
NEG	-291.694	-0.395*	-0.431*	-0.024	0.369*	0.199	-56.535	-0.200	-0.307	-0.227	-0.232	-0.177	-57.466	-0.518*	-0.470*	0.341	0.590*	0.255
EXC	60.171	-0.087	-0.126	0.115	0.260*	0.120	52.372	-0.139	-0.236	-0.166	-0.182	-0.121	1096.788	-0.019	0.037	0.408*	0.285	0.071
Commercial Loans																		
Aggregate	26.882	0.241	0.314*	0.149	-0.117	-0.258*	49.005	-0.168	0.092	0.188	0.148	0.048	30.030	0.376	0.168	-0.203	-0.443*	-0.482*
POS	284.875	0.104	0.248	0.266*	0.072	-0.192	14.366	-0.046	0.057	0.041	0.090	-0.023	-194.351	0.420*	0.482*	0.309	-0.019	-0.273
NEG	-16.554	-0.097	-0.192	-0.188	-0.197	-0.046	-11.657	-0.312	-0.351	-0.259	-0.240	0.109	-10.177	-0.430*	-0.510*	-0.177	0.002	0.062
EXC	-16.869	-0.088	-0.184	-0.183	-0.197	-0.050	-11.662	-0.315	-0.352	-0.262	-0.238	0.112	-9.504	-0.448*	-0.531*	-0.158	0.026	0.067
Individual Loans																		
Aggregate	5.061	0.269	0.592*	0.557*	0.266	-0.066	2.109	0.357	0.692	0.786*	0.795*	0.509	8.128	0.373	0.248	0.054	-0.012	-0.114
POS	6.194	-0.194	0.134	0.497*	0.416*	0.232	3.703	-0.066	0.144	0.212	0.167	0.089	-8.165	-0.010	-0.114	0.043	-0.079	0.074
NEG	51.033	0.193	-0.042	-0.249	-0.297	-0.114	-8.012	-0.319	-0.386	-0.413	-0.382	-0.277	-29.592	-0.001	-0.220	-0.082	0.022	-0.022
EXC	41.464	0.187	-0.042	-0.227	-0.282	-0.109	-8.390	-0.313	-0.378	-0.404	-0.373	-0.272	-27.448	0.001	-0.219	-0.082	0.022	-0.023

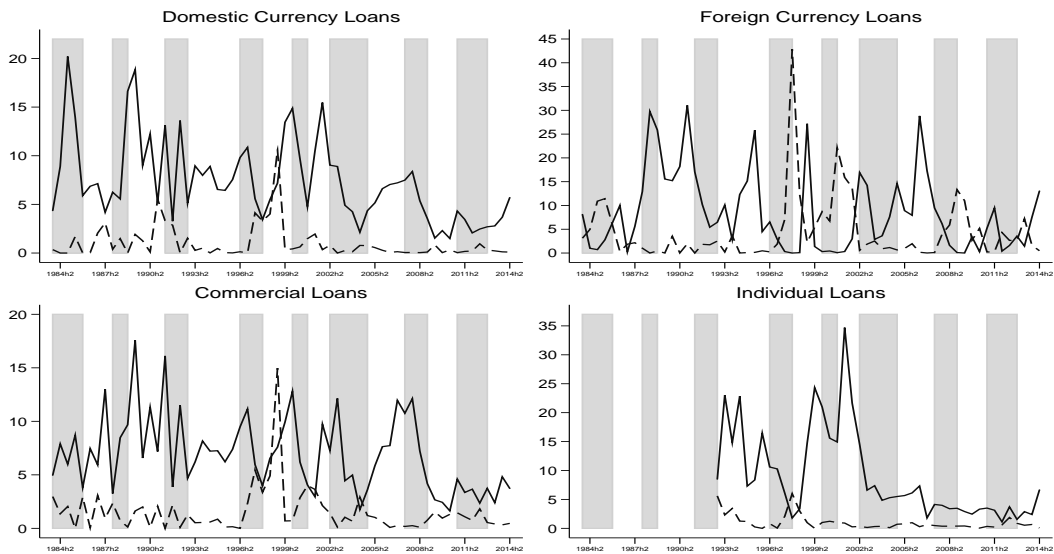
Notes: Coefficients of variance are calculated using cyclical components of series. * indicates significance at the 5% level.

FIGURE 1
Gross Loan Flows



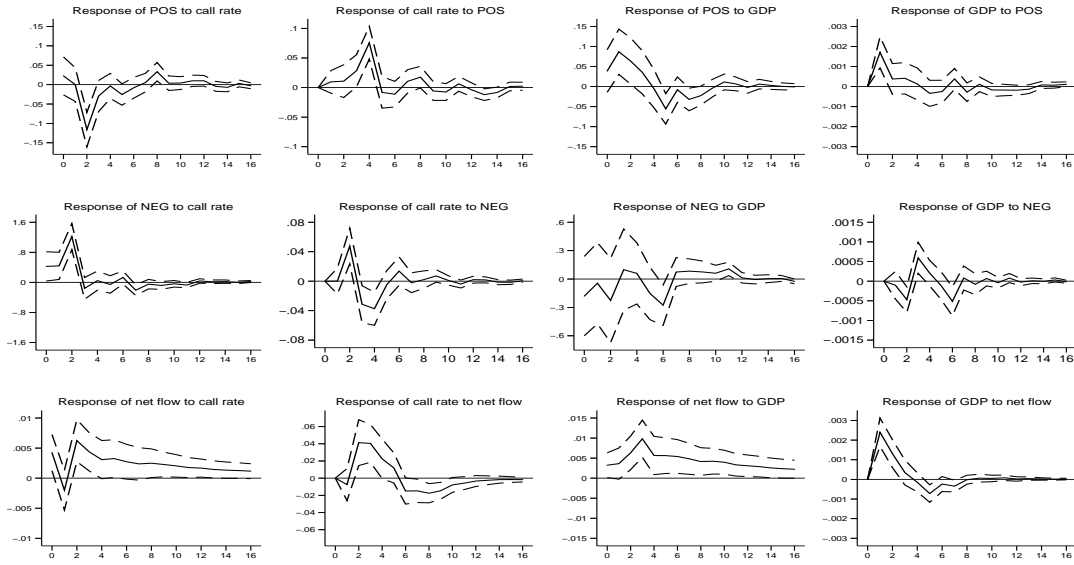
Notes: Loan expansion and contraction are presented as solid and dashed lines, respectively. Vertical shaded areas represent recessions.

FIGURE 2
Nominal Gross Loan Flows by Loan Category



Notes: Loan expansion and contraction are presented as solid and dashed lines, respectively. Vertical shaded areas represent recessions.

FIGURE 3
Impulse Responses



Notes: Dashed lines represent 95% and 5% confidence levels.