Catalytic IMF? A Gross Flows Approach

This paper argues that the strongest channel through which the IMF stabilises a borrowing country's financial flows is via its effect on the domestic banking system

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Keywords: IMF, Catalysis, residence, capital flows
JEL codes: F32, F33, F36, G01, G15

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Catalytic IMF? A Gross Flows Approach*

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Abstract

The financial assistance the International Monetary Fund provides is expected to catalyze private capital flows. Such a catalytic effect has, however, proven empirically elusive. This paper deviates from the standard approach based on the net capital inflow to study instead the Fund's catalytic role in the context of gross capital flows. Using fixed-effects regressions, instrumental variables and local projection methods, we document dynamics that are absent from existing models on the catalytic effect of IMF loans. Our results show significant differences in how resident and foreign investors react to IMF programs. While IMF lending does not catalyze foreign capital, it does affect the behavior of resident investors, who are both less likely to place their savings abroad and more likely to repatriate their foreign assets. As domestic banks' flows drive this effect, we conclude that IMF catalysis is "a banking story". In comparing the effects across crises, we find that the effect of the IMF on resident investors is strongest during sovereign defaults, and that it exerts the least effect on foreign investors during banking crises. Across program types, only loans with longer maturities seem to generate catalytic effects.

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Introduction

Many crises feature, as part of the resolution strategy, the involvement of the International Monetary Fund (IMF). In such cases, the Fund takes on the role of an international lender of last resort and provides crisis-hit economies with subsidized funding, provided those countries implement a macroeconomic adjustment program. The financial assistance is designed to give the economies breathing space in which to solve their temporary financing problems. This approach has both critics and supporters. The Fund itself defends this strategy by arguing that it reassures private creditors that the exit from the crisis will be orderly, reducing the potential for a drastic reaction (Cottarelli and Giannini, 2002). An extensive literature has assessed the importance of this, so-called, catalytic effect of official financing by looking at the net flow of capital entering/exiting countries under an IMF program. On the theoretical front, Corsetti et al., (2006) and others show that IMF lending has the potential to catalyze foreign capital inflows. Disconcertingly, from an empirical perspective, many studies cast doubt on the existence of any such positive effect. Critics have seized upon this lack of empirical evidence to argue that Fund policies are too restrictive and generate moral hazard on both debtors and creditors (Birds and Rowlands, 2002).[1]

In parallel, the literature on capital flows has recently turned its focus to the gross components of the financial account. According to this literature, the gross flows composing a country's net capital inflow react dissimilarly to different factors. Along these lines, Forbes and Warnock (2012) and Broner et al. (2013) show that resident and foreign investors' reaction functions are distinct.[2] These papers demonstrate that gross capital flows are very large and volatile, especially relative to net capital flows. They also shed light on the sources of fluctuations driving capital flows by proving that crises can affect domestic and foreign agents asymmetrically. Remarkably, to the best our knowledge, the role of the official sector in shaping the dynamics of gross capital flows remains an unexplored area.[3]

In this paper, we bridge these two literature strands by looking at the catalytic effect of IMF lending through the lenses of the gross flows composing the current account. We distinguish varieties of capital flows entering and exiting an economy

[1] IMF (2013) argues that the provision of official financing can crowd out private financing, potentially creating an anti-catalytic effect.

[2] This is also the case for inward and outward flows (see Janus and Riera-Crichton, 2015).

[3] Forbes and Warnock (2012) and Ghosh et al. (2014), two of the benchmark analyses on the determinants of sudden shifts in capital flows, control for a remarkable amount of domestic and external factors. Their regressions do not include, however, controls for IMF lending.

and study how they react to the signing of an IMF program. We follow Broner et al. (2013) and Forbes and Warnock (2012), and separate flows according to the investors' residence. The contrasting experiences of Uruguay (2002) and Turkey (2005) after their respective IMF programs were signed exemplify the relevance of our approach. As shown in Figure 1, resident and foreign investors reacted markedly differently in these two instances. In Turkey, after the IMF agreement was signed, the foreign inflow continued unabated and residents retrenched only briefly. In contrast, in Uruguay, after the signing, significant foreign capital took flight. Fortunately, residents' investment pattern also changed, cushioning the effects of the flight; after the program signing, residents started to repatriate a significant amount of their savings abroad.

To obtain more systematic and robust evidence regarding the role of IMF lending on gross capital flows, we have compiled a detailed dataset of IMF interventions and quarterly gross capital flows for over 50 economies. We use this dataset to analyze whether IMF program signings have distinct effects on gross flows. Non-random selection into official support obscures the interpretation of the relation between official credit and gross capital flows. We tackle this concern by employing an instrumental variables approach. In choosing our instruments, we follow Barro and Lee (2005) and a large literature on the political and geo-strategic determinants of IMF lending. This literature provides us with an easy and powerful way of instrumenting official support programs. Additionally, we use local projection methods (Jorda, 2005) to gauge the dynamic reaction of the various types of capital flows to different types of crises and IMF programs.

We see our contribution as two-fold. First, we document the contrasting effect of IMF loans on resident and foreign investors, and notice that is a feature absent from standard models of IMF catalysis. While the IMF appears unable to catalyze foreign capital, our evidence shows that it does affect the behavior of resident investors. Remarkably, the strength of the effect of IMF loans on residents' behavior is such that we find evidence of both more muted domestic capital flight and an increased repatriation of residents' savings placed abroad. When we look at the reaction by types of flows, we find that most of the catalytic effect relates to domestic banking flows, making us conjecture that IMF catalysis is "a banking story". We also observe that these positive effects are specially strong during global, sovereign debt and banking crises, further reinforcing our conclusion that IMF effects are tightly linked to the fate of the domestic financial system.

Second, by conducting a granular assessment that crosses types of crises and IMF programs, we obtain quite stark policy conclusions, as we document significant heterogeneity across IMF lending modalities. We use a non-linear approach

in our local projection estimates (as in Jorda and Taylor 2015) and show that both the type of crisis and the type of IMF program deployed affect the extent to which resident and foreign investors react. We document a stronger ability to catalyze domestic savings and a milder negative reaction by foreigners for those programs with a longer maturity (Extended Fund Facilities). In contrast, our results point to the other main lending program used by the IMF (the shorter maturity Stand-By Agreements) as being associated with significant foreign capital flight and a relatively minor catalysis of domestic savings abroad.

Next section frames our findings within the existing literature. Then, after describing our dataset, we discuss the empirical approach and present our results. We conclude with a reflection on the potential drivers of our findings and their implications for the theoretical work on this area.

Catalytic IMF: A review of the literature

Defenders of the catalytic effect argue that, by reassuring private creditors about the existence of an ordered exit from a crisis, these interventions can stimulate private flows when most needed. A number of theoretical contributions support this positive view. Corsetti et al. (2006) and Morris and Shin (2006) contend that IMF lending is able to reduce the incidence of panic-driven liquidity crises. Similarly, Peñalver (2004) shows that subsidized lending can induce the borrowing country to exert effort to avoid default. By raising future rates of return on investment, official lending encourages larger private capital flows. De Resende (2007) shows that if conditionality forces countries to save more, the resulting lower probability of default can encourage private lenders to relax their borrowing constraints. On the other hand, opponents argue that such policies generate moral hazard both for debtors and creditors, and that the Fund's seniority status is detrimental to the debtor-creditor relationship as it might dilute private obligations (Saravia, 2013). In a framework of panic-driven liquidity runs, Zwart (2007) qualifies the results in Corsetti et al. (2006) by showing that catalysis may not materialize given that, through its signaling effect, IMF support can trigger capital flight.[4]

An extensive literature has studied empirically the significance of the IMF's catalytic effect, delivering at best mixed evidence. Critics have seized upon this lack of empirical evidence to argue that an overestimation of its catalytic role has led the Fund to impose excessively contractionary policies (Birds and Rowlands,

[4]Interestingly, none of these contributions distinguishes resident and foreign investors.

2002). So far, the literature has focused on the current account and specific categories of net capital flows. A majority of studies, either regression analyses or case studies, cast doubt on the existence of any such positive effect (Ghosh et al, 2002), although a catalytic effect has been found in some circumstances. Various papers have tested whether access to capital markets response to IMF lending differs with the program design. Mody and Saravia (2006) find that Fund programmes do not provide a uniformly favorable signaling effect. Instead, the evidence is most consistent with a positive effect of IMF programmes when they are viewed as likely to lead to policy reform . Mina and Martinez-Vazquez (2002), using aggregate country data, find that IMF lending reduces the countries' reliance on short-term debt flows. Eichengreen and Mody (2003) find a stronger catalytic effect for intermediate economic fundamentals. Edwards (2003) finds no catalytic effect on bond issuance. The opposite is true for Mody and Saravia (2003), who find that larger programs are associated with stronger catalysis and that a continued IMF presence in a country reinforces this effect. However, an excessively lengthy presence can be perceived as a sign of failure, discouraging capital flows. Eichengreen et al. (2005), who argue that the Fund's role as a vigilante is more likely to manifest in bond markets, find that, in high-debt countries, it is the size of assistance that attracts private capital. Focusing on the volatility of net capital flows, Broto et al. (2011) show that the larger availability of Fund resources lowers net flows' volatility. Saravia (2013) presents evidence on the relation between IMF lending and countries' private and public debt maturity choices. Saravia finds that IMF loans reduce the maturity of new debt. He argues that this is due to its senior status.

Data

Information on IMF interventions was collected from the IMF's web-page and various program reviews. While information is available from the 1950s, the data used in this paper is restricted in two dimensions. First, we do not go back beyond 1990 due to the scarcity of information on a sufficiently granular (quarterly) basis and we stop in 2008, given that the IMF changed both its Balance of Payments methodology and portfolio of crisis resolution tools in 2009. Second, we only focus on the IMF's two traditional credit lines of crisis resolution which are funded through its general resources: the IMF Stand-By Arrangement (SBA) and the IMF Extended Fund Facility (EFF). The SBA, established in 1952, is the IMF's workhorse lending instrument for emerging and advanced market countries. The

SBA aims to help member countries address their short-term balance of payments problems, emerge from crisis and restore sustainable growth. The Extended Fund Facility (EFF) focuses on helping countries overcome their medium/longer-terms balance of payments problems. This implies a longer program engagement (up to 4 years instead of 3 under the SBA) and a longer repayment period (up to 10 years instead of the 5 allowed for the SBA). After this selection, we finish with a sample of over 140 programs. The data set includes the date of the arrangement, the actual date at which the program finished (end of the arrangement), the type and size of the program.[5]

The capital flows data comes from the analytic presentation of the IMF's Balance of Payments Statistics Yearbooks (BOP). The IMF's BOP dataset provides detailed disaggregated country-level data, on a quarterly basis since 1970. This dataset allows us to construct various measures of Gross Capital Flows, including by type of Flow. To understand the true catalytic effect of assistance programs into capital flows we have to be careful in defining what is being "catalyzed". In this sense, just looking at a typical measure of Net Capital Flows (i.e. changes of all liabilities – changes of all assets) could be misleading. The negative economic effects of sudden net inflow reversals are well documented. [6] To see this, simply imagine that the impact of international assistance programs has an asymmetric effect on the behavior of domestic resident investors and foreign investors; aggregating these, potentially opposite, effects could hide the true nature of these programs' catalyzing role. Thus, our net residence decomposition of the net inflow is defined as:

$$Net\ Inflow_{it} = \triangle Liabilities_{it} - \triangle Assets_{it}.$$

This decomposition allows us to distinguish capital outflows by domestic agents (COD), marked by changes in foreign assets held by domestic residents, from capital inflows by foreigners (CIF), which are measured as changes in liabilities of the reporting country's residents held by foreign nationals (see Broner et al. 2013).

Finally, our dataset includes additional variables that are used as controls, either in the panel regressions and linear projections, or as instruments when implementing our instrumental variables strategy. The controls include the High Yield

[5]The data set also includes the original (programmed) expiration date. Actual and programmed end dates may differ either due to a program extension or an early cancellation. Using these dates one could compute both the program duration on approval and actual duration. Additional information includes the volume of funds finally drawn under the program, size and date of any program augmentation and information about its precautionary character.

[6]See Calvo (2003) or Hutchinton and Noy (2006).

Index, the VIX index and the Federal Funds Rate obtained from DataStream, and the Chinn-Ito Index of capital account liberalization and nominal GDP growth from the World Economic Outlook database.

Empirical Analysis

In this section, we showcase the results of our empirical analysis on the effects of IMF financial assistance on the components of the net capital inflow. First, we report some important stylized facts from our main variables. Then, we turn to the regression analysis. We start with a simple least squares dummy variable (LSDV) estimation approach with lagged independent variables. While the lagged structure imposes some degree of causal direction in our regressions, we are well aware of the potential feedback effects and, therefore, potential endogeneity bias in our main coefficients. To address these concerns, we collect a series of instruments documented in the political science literature and use them in a panel instrumental variable (IV) approach. While a good first step to examining the effects of Fund programs on capital flows, our LSDV and panel IV estimations are unable to capture the potentially rich dynamics between these variables. To understand these dynamics better, we use the Local Projections methodology introduced by Jorda (2005) and Stock and Watson (2006) to estimate a set of efficient impulse response functions. As a final robustness check, in order to assess whether the effects depend on the type of crisis being faced and the type IMF program signed, we combine our IV analysis with the local projections methodology.

Stylized Facts on IMF Lending and Gross Capital Flows

Table 1 shows the summary statistics for IMF programs. As mentioned above, we have a large number of programs (147 program onsets) but, perhaps even more remarkable, approximately 23 percent of our observations correspond to an ongoing IMF program. Countries in our sample underwent, on average, three IMF programs during our sample period. There is a large variation in the size of the programs both in absolute terms and relative to the countries quota with an average of 1.3 billion SDR or 121 percent of the country's quota at the Fund. To complete the dynamic view of our Fund Program data, Table 2 presents a transition probability matrix. This matrix shows that those countries without an ongoing program have around a 3 percent chance of an onset, while those undertaking a program face around a 90 percent probability of continuation.

In the last part of the paper, we study the interaction between IMF assistance programs and different crisis types. While, by design, an IMF presence is closely related to balance of payment problems, many of the episodes studied are not associated with the standard crisis indicators (currency, banking or debt crises). This may be because the country avoided a deeper deterioration of its macroeconomic situation or because the Fund was present in a (successful) preventive role. In those cases in which the countries do descend into macroeconomic turmoil, the reaction of capital flows to a Fund program could differ significantly across the varying types of underlying crisis. In this paper, we focus on four types of crisis: currency, banking and sovereign debt from both a domestic and a foreign perspective. Our data on economic crises is based on Carmen Reinhart's variety of crises dataset. As her dataset does not cover all of our sample countries, we have also used information from S&P, Laeven and Valencia (2013) and Broner et al. (2013). Table 3 gives us an idea of the number and distribution of assistance program onsets across our sample as well as the interaction between program onsets and economic turmoil. From this table, we observe that around 56 percent of Fund program onsets are in crisis-hit countries, with the programs beginning in the midst of a currency, banking, external sovereign debt and domestic sovereign debt crisis in 61, 50, 43 and 18 percent of the times, respectively.[7] The table also provides information on the average number of IMF programs per country and the total number of countries with at least one onset. We have 39 countries with at least one program onset, among these, each country has an average of 3.7 onsets during the sample period.

Table 4 shows the summary statistics for the different measures of Capital Flows and explanatory variables used in the paper. We observe that Total Gross Flows (sum of the two components of equation 1) hover at around 28 percent of GDP. Most of these flows originate from the private sector (23 percent). If we split the sample purely by the direction of the flow, we observe that, in our sample, total private flows are divided into 12 percent inflows and 10 percent outflows. If we split the flows by residence of origination, we discover that the volume of CIF revolves at around 7 percent of GDP and COD at around 4.5 percent. Splitting the sample by type of flow, we observe that most of the recorded flows correspond to the category of "Other Investment" (14 percent of GDP), which is dominated by international banking transactions. Foreign Direct Investment (FDI) with 5.5 percent and Portfolio Investment with 3.6 percent follow.

Figure 2 shows the evolution of gross flows against the backdrop of the num-

[7]Nothing precludes an IMF program from being put in place against the backdrop of a twin or triple crisis.

ber of programs in effect. Decomposing Total Gross flows into Private and Public Gross Flows, we identify two distinct waves of financial integration. The first wave runs from the end of the EMS crisis in 1993 to the beginning of the Asian Crises in 1997. After the Asian and Russian Crises (1997-98), private gross flows slowly declined until the end of the Argentinean crisis in 2002. The second wave arrives in the latter part of the so-called "Great Moderation" (2004-08). During this period, total private gross flows in our sample averaged 30 percent of GDP. At the same time, the number of ongoing programs declined from an average of around 12 to 2. The series of Official Gross Flows shows an interesting break in its volatility around the time of the Asian crises. Before the crises, high levels of volatility, reaching peaks above 10 percent of GDP, characterized the official flows. After 1997, the series remained subdued at around 3 percent of GDP. Another interesting decomposition of Gross Flows, shown in figure 2, focuses on gross flows by residence. Looking at the inflow/outflow decomposition by residence, we observe the collapse of both measures, but especially inflows, during episodes of external turmoil. This, of course, follows on the footsteps of the sudden stops literature (Forbes and Warnock, 2012).

Least Squares Dummy Variables Estimation

In our basic specification, we use the following simple LSDV estimation:

$$Y_{it} = \alpha_i + \delta_t + \sum_{n=1}^{4} \theta_n \, IMF_{it-n} + \beta X_{it-1} + \mu_{it},$$

where Y_{it} represents the different components of the net inflow of country it at time t, IMF_{it} is a dummy indicator signaling whether country i signed an IMF program at time t, and X_{it} is a vector of controls that include four lags of GDP growth, the HY Index, the Fed Funds rate, the Chinn-Ito Index of capital openness, the VIX index, and a crisis indicator taking value one whenever the country is in a crisis. Our regressions also include country and time fixed-effects and a time trend.

Results from this simple specification are displayed in Table 5. In terms of the coefficients of the controls, there are no surprises. As in Alberola et al. (2015), economic growth helps increase foreign inflows but is not so clearly related to outflows. Good High-Yield performance promotes both inflows and outflows, increasing total gross flows. Instead, financial turmoil slows foreign inflows significantly. Capital openness seems to encourage total gross flows and financial

volatility (VIX) deters domestic outflows.

Regarding the effect of IMF programs, to help our analysis, we report the sum of all lagged coefficients of the IMF onset dummy. We measure significance with a Wald Test of the null of the sum of the four coefficients being zero. From the table, we can observe that, related to the previous literature, program onsets seem to have no catalytic effect on net inflows, pushing countries into larger current account surplus and having no effect on total private gross flows. A more complete story surfaces when looking at the decomposition of the net inflow by origination of those flows. The last two columns of Table 5 show the reaction to the onset of a Fund program by foreign inflows and resident outflows. From these two columns it becomes clear that the "no effect" on total private flows results from a weighted average of two important and opposite forces. On the one hand, the program onset seems to have an "anti-catalytic" effect on inflows from foreigners, prompting a relatively large decrease of those inflows in the year following the onset. On the other, it seems to exercise a catalytic effect of similar size on outflows from residents. In other words, the Fund program onset prevents to some degree domestic capital flight. The size and timing of these effects, however, differ. While after four quarters the accumulated decrease in inflows from foreigners and outflows from residents are similar at around 5% of GDP, the bulk of the inflow effect occurs in the first quarter following the program's establishment and the bulk of the outflow effect with a lag of two quarters. We explore these interesting dynamics in the sections below.

Panel Instrumental Variables Estimation

Eichengreen and Mody (2003) argue that, when trying to understand the effect of IMF programs on macroeconomic outcomes, it is necessary to control for the fact that selection into such programs is non-random, as this could bias the estimated coefficients. In this section, we apply an instrumental variables approach to tackle this problem. As described below, our choice of instruments is guided by a significant body of research that has focused on understanding the political and geo-strategic determinants of IMF lending. As noted by Edwards and Santaella (1993), Barro and Lee (2005) and Saravia (2013), the literature has uncovered a set of geo-political and institutional determinants of IMF lending, which can be used to address endogeneity concerns. More specifically, we base our identification on four different sets of political factors: internal IMF politics, borrowing country's politics, geo-politics and official sector politics.

As regards the role of internal IMF politics, Barro and Lee (2005) and Saravia

(2011) argue that a country's quota at the IMF is also a significant determinant of IMF financial support.[8] Country quotas can serve as an instrument to the extent that they indicate the country's political power within the institution. Additionally, we model the borrowing country's political factors as follows. Vreeland (2006) observes that countries where the political system has more veto power are more likely to have IMF programs and that countries are less likely to sign IMF programs when elections are coming up soon. Relatedly, Dreher (2002) shows that IMF programs are more likely to go off-track ahead of elections. In turn, Edwards and Santaella (1993) find that dictatorial regimes are less likely to engage with the IMF. They rationalize such results as follows. An important role of international organizations is to do national governments' "dirty work." By involving multinational bodies in the decision-making process, local politicians can shield themselves from the political fallout associated with unpopular policies. This implies that governments with a more unstable political base, and thus likely to suffer more severely from unpopular policies, will recur more frequently to the IMF. A second implication of this public choice view is that, other things being equal, countries with dictatorial regimes will have a smaller incentive to request IMF assistance. This is because dictatorial regimes, in general, can withstand unpopular adjustment programs without suffering serious political consequences. In turn, Tacker (2000), Barro and Lee (2005) and Dreher and Sturm (2006) provide us with geo-political instruments. They argue that political proximity, as measured by the various countries' voting alignment with the US (and other advanced economies) at the United Nations and other international fora, helps explain IMF lending.[9] Finally, we use two variables associated with the politics of the official sector. First, we use the signing of an agreement with the Paris Club, which automatically requires the signing in turn of an IMF program. Papi et al.'s (2014) analysis of the effect of IMF lending on banking crises successfully uses flows of development assistance (ODA flows) into the economy as an instrument for IMF lending. We follow them and include that variable in our estimations.

With this identification strategy in mind, we estimate the following model of the effects of IMF programs on gross capital flows:

[8] Relatedly, Dreher and Vaubel (2004) and Copelovich (2004) include the total amount of resources available to the Fund as a determinant of IMF lending. Also overall resources and fresh injections of resources can be used as instruments as they may reflect IMF-bureaucrats incentives to lend (Dreher and Sturm, 2006).

[9] http://www.uni-heidelberg.de/fakultaeten/wiso/awi/professuren/intwipol/datasets.html.

$$IMF_{it} = \alpha_i + \delta_t + \varphi X_{it-1} + \gamma Z_{it-1} + \varepsilon_{it}, \quad (1)$$

$$Y_{it} = \alpha_i + \delta_t + \sum_{n=1}^{4} \theta_n IMF^{IV}_{it-n} + \beta X_{it-1} + \mu_{it}. \quad (2)$$

Equation (1) models the presence of the International Monetary Fund. Equation (2) models the determinants of gross flows. Equation (2) is estimated using a lineal panel data model. Y_{it} represents the different types of capital flows used in the analysis. X_{it-1} covers a set of lagged controls including, as before, output growth, foreign interest rates, capital control measures, crisis dummies and foreign financial volatility measures. In turn, Z_{it-1} contains the political and geostrategic factors used to instrument the IMF's presence. The variable IMF^{IV}_{it-n} defines the estimated likelihood of signing a program with the Fund obtained from equation (2). Our regressions include country fixed effects, time effects and a time trend in an effort to capture the increases in global financial integration. Finally, we use HEC errors clustered by country.

We include in Z_{it-1} all of the instruments discussed above. The first-step results are presented in Table 6a. Most of our instruments are highly significant and display the expected signs. Thus, countries with more influence (via IMF quota, their presence on the UN Security Council or their alignment with the US at UN voting) are more likely to be granted assistance. Also as expected, dictatorial regimes are less likely to receive IMF support than democracies, and democracies are less likely to obtain assistance during and prior to election periods. Finally, higher levels of developmental assistance (ODA) and negotiations with the Paris Club also function as robust predictors of countries accessing IMF resources.

In the second step, we regress our various gross capital flows measures against the instrumented lag of the IMF indicator and the set of exogenous determinants of the gross flows used in the previous specification.[10] Table 6b shows the results for the gross flows equation (second step). As before, we provide the sum of the coefficients of the four lags on every IMF lending agreement. Our IV analysis corroborates the main set of results found in the LSDV specification. From a residence perspective (last two columns), we again obtain very stark and interesting results. While the IMF is able to catalyze domestic capital flows (reducing the domestic capital drain), it does not seem to be able to reduce the capital flight by foreigners. In fact, if anything, IMF programs apparently trigger further foreign capital flight.

[10]Since the results from our exogenous controls are very similar those found in Table 5, we decided not to include them in table 6. A complete set of results can be obtained by request.

Table 7 presents our estimates of domestic and foreign flows broken down by the categorization of the capital flows. Thus, we distinguish flows of entry and exit for FDI, portfolio investment and other investment. Although we also find a significant negative effect on the inflow of foreign FDI, the results show that a program's effects are stronger on other investment categories. As this indicates that the results obtained when looking at broader gross flows measures are largely driven by domestic banks' flows, we conclude that IMF catalysis appears to work best vis-à-vis domestic banks.

Dynamic effects

So far, we have not focused on the dynamic responses of capital flows to the inception of an assistance program. In this section, we study such dynamics by presenting a set of representative cumulative impulse response functions using the local projections methodology.

In our cumulative impulse response function estimation strategy, we follow Jorda (2005), Stock and Watson (2007), and others in the use of linear "local projections" (LP) for the construction of our impulse response functions (IRFs). This methodology allows us to directly project the behavioral reaction of gross private capital flows to the signing of an IMF financial assistance program by computing estimates of the h-step ahead cumulative average treatment effect on the gross flows variables.[11] This methodology provides a flexible alternative to VAR approaches. As described by Jorda (2005), linear projections can be estimated by simple single regression techniques (LSDV in our case) and they are more robust to misspecification errors. While widely used in the literature, as explained in Ramey (2014), this method does not consistently dominate the standard Structural VAR method for calculating impulse responses of endogenous variables with contemporaneous effects. Since local projections do not impose any restrictions linking the impulse responses at h and h+1, estimates can display erratic behavior due to the loss of efficiency. Additionally, as the horizon increases, one loses observations from the end of the sample. Finally, the impulse responses sometimes display oscillations at longer horizons. Comparing Jorda to a standard SVAR and a dynamic simulation, Ramey (2012) finds that the results are qualitatively similar for the first 16 quarters. For longer horizons, however, the Jorda method tends to produce statistically significant oscillations not observed in the other two meth-

[11] Local projections are, in practice, regression-adjusted difference-in-difference estimates that collapse the time series information in a pre and a post period for each step ahead.

ods. Since, in this study, we are interested in the short- and medium-horizon effects of fund programs we can safely disregard these drawbacks.

In our basic linear specification, each response of changes in capital flows to contemporaneous onset of financial assistance programs at horizon h is obtained from the following equation:

$$\triangle Y_{i,t+h} = \alpha_{i,h} + \beta_h IMF_{i,t} + \Psi_h(L) IMF_{i,t-1} + \Phi_h(L) \triangle Y_{i,t-1} + \\ + \Upsilon_h \triangle X_{i,t-1} + \sigma_{t,h} + \mu_{i,t,h}$$

where $\triangle Y_{i,t+h} = Y_{i,t+h} - Y_{i,t+h-1}$ for $h \geq 0$, and $\triangle Y_{i,t+h}$ represents the accumulated capital flow measure over GDP at time $t+h$. The lag polynomials $\Psi_h(L)$ and $\Phi_h(L)$ represent four lags. $IMF_{i,t}$ represents the dummy for the signing of an IMF program and $X_{i,t-1}$ covers the same set of lagged controls used in the previous sections. Finally, we include a full set of country and year dummies. Every equation, for each h, is estimated using a standard LSDV approach. We use robust Driscoll and Kraay (1998) standard errors to correct for potential heteroskedasticity, autocorrelation in the lags and error correlation across panels.

Figures 3 to 7 give us the projected reaction of different flows to the onset of an IMF program. Looking at Figure 3, we observe a steady increase in total gross flows over time after the onset of a program. This increase is driven entirely by official gross flows since the aggregated private flows stay flat and even start decreasing after a year (although the coefficient remains statistically insignificant.) As before, interesting results appear after decomposing the gross private flows into inflows and outflows. As we can see from Figures 4, the first asymmetry between foreign inflow (CIF) and domestic outflow (COD) responses is represented by CIF's faster reaction to the program's onset; we observe a significant drop in COD, up to four percent of GDP after one quarter. Meanwhile, CIF only reacts negatively on impact, with a two quarters after the program signing. A second asymmetry is observed on the size and standard deviation. CIF displays larger standard errors while COD displays tighter errors. This lends credence to our previous narrative in a dynamic setting: we observe that the presence of the fund has a significant catalyzing effect on domestic outflows in the medium run while it also seems unable to encourage foreign inflows in the short run.

Figures 5 to 7 look at the IRFs for each type of flow. Interestingly, the pattern described for aggregate flows seems to be driven mostly by the "other investment" component. With cross-country bank loans representing the bulk of this type of flows, we seem to be looking at a "banking story". Figure 5 shows the

reaction of FDI, CIF and COD to the onset of an IMF program. Given the long-term nature of these flows, it is not surprising that the point estimates of the IRFs remain relatively stable after the shock. In any case, we do observe a mild increase in outflows in the medium run peaking at almost 1 percent of GDP after 6 quarters, and no statistically significant effect on FDI inflows.

Figure 6 turns to the reaction of Portfolio (debt and equity) flows. Not surprisingly given the short-term nature of these flows, we observe significant variation among the point estimates of these IRFs. Remarkably, the IMF seems to be successful at reducing significantly the amount of portfolio outflows by residents in the first 4 quarters, with an accumulated reduction peaking close to 1.5 percent of GDP. Again, the IMF presence seemed ineffective in promoting portfolio CIF, although we do observe an increase in these flows after two years. Finally, Figure 7 shows the reaction of "Other Investment Flows" (OI). "Other Investment" flows are composed of international loans, trade credits, currency and other flows. The bulk of these flows lay accumulated in the international loans category. Figure 7 shows that the reaction of both OI CIF and OI COD is a larger magnitude than what we observed with FDI and PI. In this case, the pattern of both IRFs mimics the general pattern described in the beginning of this section. CIF decreases around 2 percent of GDP on impact and, while it peaks after five quarters at around 4 percent of GDP, this effect is insignificant. In turn, resident outflows of other investment take 3 quarters to react but then, after six quarters, peak at an accumulated decrease of around 4 percent of GDP. As before, error bands are smaller for COD than for CIF.

Next, as a robustness check given the potential endogeneity issue described in the previous section, we follow Jorda et al. (2014) and use an instrumental variables approach in our local projection regressions:

$$\triangle Y_{i,t+h} = \alpha_{i,h} + \beta_h IMF^{IV}_{i,t} + \Psi_h(L) IMF^{IV}_{i,t-1} + \\ + \Phi_h(L) \triangle Y_{i,t-1} + \Upsilon_h \triangle X_{i,t-1} + \sigma_{t,h} + \mu_{i,t,h}$$

where $IMF^{IV}_{i,t}$ represents the signing of an IMF program, instrumented using the variables introduced in the previous section.

Figure 8 shows the results of these Instrumented Local Projections. In Figure 8, we report the IRFs for foreign inflows (CIF) and resident outflows (COD) to a one standard deviation increase in the estimated probability of a signing a program with the IMF. The results are even stronger than those using the IMF program dummy directly. To assess the validity of out instrumental variables approach, we

performed a battery of tests, including the Kleibergen-Paapunder identification and weak identification tests and the Hansen's over-identification test, to assess the validity of our instruments. As reported in Table 8, all of them supported our identification strategy.[12]

Dynamic effects: program design and underlying vulnerabilities

As discussed in the literature (Edwards, 2003), an IMF program could lead to different effects depending both on the underlying macroeconomic circumstances of the country, and on the type of financial assistance it receives from the IMF. In this section, we study this possibility by crossing features of the IMF programs and of the type of crisis the country is facing. This provides us with a very granular and interesting picture of the dynamics of gross capital flows during IMF interventions.

We begin by looking at the effect of program design. We do so by separating our sample of IMF programs according to whether they are Stand-By Agreements (SBA) or Extended Fund Facilities (EFF).

$$\triangle Y_{i,t+h} = \alpha_{i,h} + \beta_{1,h} SBA_{i,t} + \beta_{2,h} EFF_{i,t} + \Psi_1, h(L) SBA_{i,t-1} + \Psi_{2,h}(L) EFF_{i,t-1} + \\ + \Phi_h(L) \triangle Y_{i,t-1} + \Upsilon_h \triangle X_{i,t-1} + \sigma_{t,h} + \mu_{i,t,h}$$

where $SBA_{i,t}$ is a dummy taking value one when the country signed a SBA program with the IMF, and $EFF_{i,t}$ ris a dummy taking value one when the country has signed an EFF program.

In Figures 9 and 10 we depict the impact on gross outflows (COD) and inflows (CIF) of having different program types. In Figure 9 we observe that COD reacts significantly to both types of programs. Regardless of whether the IMF lends using a SBA or EFF program type, there is a significant retrenchment of domestic capital associated with it. While the point estimates show quite different peak effects, almost 8 percent of GDP during EFF and almost 4 percent during SBA, the difference is never significant. In turn, Figure 10 depicts the dynamics of CIF. According to our IRFs, and in line with previous results, there is a short lived but

[12]Given that expectations seem an important driver of capital flows, to make sure that our previous results are not biased by reactions to expectations, in unreported results, we upgraded our previous local projection specification including a lagged term of our instrumented measure of IMF program onset. Comfortingly, the results showed no significant changes in our original results.

significant negative effect on CIF by both types of programs. During the first two quarters, CIF flows are almost 2.5 percent of GDP lower. Again, as indicated by the lack of yellowed triangles, we do not observe a significant difference in the respective coefficients.

Next, we look at what happens during crises with and without the IMF. In so doing, we upgrade our original local projection estimation to include an interaction term with our crisis indicators, and compare the effects to a baseline IRF under no crisis. Thus, our new estimation strategy is based on the following equation:

$$\triangle Y_{i,t+h} = \alpha_{i,h} + \beta_{1,h} D_{i,t} + \beta_{2,h}(IMF_{i,t} \cdot D_{i,t}) + \Psi_h(L) IMF_{i,t-1} + \\ + \Phi_h(L) \triangle Y_{i,t-1} + \Upsilon_h \triangle X_{i,t-1} + \sigma_{t,h} + \mu_{i,t,h}$$

where $D_{i,t}$ is a dummy taking the value of one in case the country is facing any type of crisis and $IMF_{i,t}$ represents the IMF dummy. We build the baseline IRF from the coefficients $\beta_{1,h}$ (where we assume $IMF_{i,t} = 0$) and we compare these results to the sum of $\beta_{1,h} + \beta_{2,h}$ (equivalent to assuming $IMF_{i,t} = 1$).[13] Finally, we test the statistical significance of the differences between the effects under crisis and without crisis. This test is equivalent to test for $\beta_{2,h} = 0$. We include a yellow marker in the y-axis if the difference is significant at a 90% confidence level.

Following the above non-linear specification, figure 11 shows the reaction of COD to a crisis, with or without the IMF. As in the baseline specification, the effects on domestic outflows of an IMF program during a crisis do not appear until the second quarter after the shock. Interestingly, while the long-run accumulated response is similar during crises and no-crises episodes, the medium-run response is not. During crises, the reduction in COD is much sharper after only 2 quarters, dropping beyond an accumulated 5 percent of GDP by the third quarter and peaking at 6 percent in the fifth quarter. As shown in Figure 12, the IRF of CIFs draw a very interesting set of results as well. We observe that the response of CIF to IMF programs during crises is larger than the baseline estimates during the first four quarters. Once the program is in place, CIF drops by 3 percent of GDP on impact and the response peaks after 8 quarters at around 12 percent of GDP. In contrast, the baseline estimates are very close to zero in the short run and peak around 8 percent of GDP in the long run.

Next, we further increase the degree of granularity of the effects by using subcategories of both crisis and program types. First, for the subcategories of crises,

[13] In other words, we analyze the effect of IMF lending under the baseline of turmoil.

we divide these episodes among local crises and global crises. We do so following the approach in Alberola et al. (2015), and define as global those crises that occur during years in which the VIX jumps more than two standard deviations. Any crisis not occurring in such periods, we consider it a domestic crisis. Additionally, we also separate our set of crises indicators into the following types: currency crises, banking crises and sovereign debt crises. As before, we divide our set of IMF programs into SBA and EFF programs types.

For all the pairs within these two breakdowns, we study the heterogeneous effects of having signed an EFF or SBA agreement with the IMF, and compare the effects to the benchmark of facing that type of crisis without IMF lending. For the sake of comprehensiveness, instead of providing full IRFs for each of these scenarios, Figures 13 and 14 present a summary of the results by selectively plotting three points for each IRFs: after one quarter, after one year and after two years.

The results in Figure 13 show that there are important differences on the dynamics of gross flows depending on whether the shock is local or global and whether it is tackled using a SBA or an EFF program. The three panels on the left hand side present the dynamics of COD. The upper one contains the dynamics for all crises, the middle one depicts the effects during local crises and the lower panel contains the results during global crises. The panels on the right present analogous information for our measure of foreign inflows (CIF). Our results show that in the face of local crises, SBA programs are associated to significantly larger foreign capital flight, starting as soon as one quarter after the signing of the program and reaching up to 12 percent of GDP after 4 quarters. On the other hand, EFF programs appear to have no significant effects on foreign capital flows in the face of a local crisis.

Another striking divergence appears under IMF lending during global crises. Here, similar to what we obtained so far, we find that EFF programs consistently reduce the outflows from residents. Instead, SBA programs seem closer to generating a domestic capital flight. On the other hand, looking a foreign inflows during global crises, it seems that SBA programs only generate significantly more damaging effects after 8 quarters.

Finally, Figure 14 presents the results when crises are broken down according to whether they are banking, currency or sovereign debt related. Our main findings are summarized as follows: First, as shown in the middle and upper-right panels, we observe that SBA programs are accompanied by a larger foreign capital flight than EFF programs, whenever the country is facing either a banking crisis or a currency crisis. Second, we find no differences if gross foreign inflows when the

programs are signed in the middle of a sovereign debt crisis. Third, SBAs seem to have no significant effect on domestic outflows, no matter the type of crisis. Fourth, only EFF programs appear capable of reducing residents' outflows.

To sum up, we find that, in average, IMF programs produce heavily asymmetric effects on inflows from foreigners and outflows from residents. When looking at the different types of flows, we observe that these differences are most striking among the "other investment" categories which lead us to believe that IMF programs affect international banking flows the most. Additionally, we find that EFF programs are most effective in catalyzing resident flows. Instead, we only find no evidence supporting a catalytic effect of SBA programs. On average, we find no evidence of catalysis on inflows for either type of program.

During times of crises, both the catalytic effect on outflows and the anti-catalytic effect on inflows by IMF programs are enhanced. When considering the global or local nature of crisis, we find that differences between EFF and SBA programs are largest during global crises. During these events, EFF programs catalyze both gross inflows and outflows in the short and medium run. In turn, when we cross program and crises types, we find that, while EFF programs lead to catalysis in outflows during currency and banking crises, the strongest effects by EFF programs are found after four quarters during episodes' sovereign defaults.

Implications

The findings in this paper have implications for the theoretical work that studies the macroeconomic effects of IMF lending. Remarkably, the theoretical literature in this field has no yet modeled the response of resident investors to the signing of an IMF program by their domestic authorities. Instead, to date, work in this area has focused on understanding the effect of IMF lending on the dynamics of foreign capital flows.[14]

Given the need to rationalize diverging responses by residents and foreigners, we posit that models would need to incorporate asymmetries (or frictions). In their absence, we see no reason for official lending to affect foreign and domestic agents in different ways. For example, our findings are consistent with IMF lending generating (or operating under the presence of) asymmetric information. This could happen because, as in Dvorak (2003) or Evans and Hnatkovska (2005), domestic and foreign investors may have different information sets that the IMF can

[14]See Morris and Shin (2006), De Resende (2007) and references therein.

influence.Alternatively, residents and foreigners might react differently to new "information" from the IMF.[15]

Relatedly, our results can be thought of as the result of the existence of pay-off complementarities between the IMF and domestic investors. Under this mechanism, the key IMF contribution would not be information, but the funding it provides. We note that such an argument has already been used in the theoretical literature, but with a focus on foreign investors.[16] To the extent thatIMF loans enhance the authorities' capacity to handle the crisis, they also affect the investors' pay-off from holding domestic assets. Candidate explanations for this complementarity are numerous. Our preferred one is that, as argued by Reinhart and Sbrancia (2011), resident investors are more willing to repatriate assets when they are confident about the strength of their currency or about the ability of the monetary authorities to manage financial instability. This could happen if the Central Bank is seen to be building an adequate volume of international liquidity when using an IMF loan.[17] Another source of asymmetry between domestic and foreign investors could be sovereign risk or, more generally, shocks associated with a relative deterioration of foreign investors' property rights. For example, Broner et al. (2008, 2010) show that if sovereign default is more likely to be detrimental to foreigners than to residents then, during crises, the former have an incentive to sell domestics assets to the latter, potentially leading to gross flows dynamics like the ones we document and discuss in this paper.

Our findings regarding the differential effects of EFF and SBA loans also inform a growing literature interested on the effects of debt maturity on fiscal and economic performance. In line with Hatchondo et al. (2016) and Chatterjee and Eyigungor (2012), our results show that the longer the maturity of the official sector loans (EFF versus SBA), the more benign is the reaction of private creditors.[18] According to this literature strand, the reason for the different effects would be that EFF-style loans, by back loading debt repayment, reduce the extent of credi-

[15]In modeling gross capital flows (although not the IMF), Dvorak (2003) emphasizes the role of information asymmetries both between and within countries. Similarly, Brennan and Cao (1997) and Tille and van Wincoop (2008) argue that a domestic retrenchment can occur if foreign investors are less informed than resident ones about the return of domestic assets and crises increase this asymmetry.

[16]See Corsetti et al. (2007) or Morris and Shin (2006).

[17]Cheng (2015) shows that countries can use foreign reserves to enhance their domestic economies' resilience to potential risks from balance sheet effects.

[18]Hatchondo et al. (2016) finds that eliminating dilution increases the optimal duration of sovereign debt by almost 2 years. In turn, Chatterjee and Eyigungor (2012) show that in the presence of roll-over risk, long maturity sovereign borrowing is superior to short term borrowing.

tor dilution, facilitating the flow of private capital.[19]

Conclusions

In this paper, we have studied the catalytic effect of IMF lending from a gross flows perspective. Our results show the existence of an asymmetric reaction of resident and foreign investors to IMF programs. While IMF programs, in average, do not appear able to catalyze foreign capital, there is substantial evidence that they affect the behavior of resident investors. Remarkably,the change comes from both a more muted domestic capital flight and an increased repatriation of residents' savings abroad. Moreover, the relevance of banking flows for understanding such dynamics makes us posit that IMF catalysis is a banking story.

When we study the potential for heterogeneous effects across program and crises types, we find that EFF programs, designed to address longer term external imbalances, are markedly more effective catalyzing gross flows. This is specially true during episodes of global turmoil, where EFF programs are able to decrease outflows by 20 percent and increase inflows by almost 10 percent of GDP after just one year.

The findings in this paper have implications for the theoretical work that studies the macroeconomic effects of IMF lending, which has no yet modeled the response of resident investors to the signing of an IMF program by their domestic authorities.

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Appendix: Figures and Tables

FIGURE 1. Gross Flows and the IMF: Uruguay 2002 and Turkey 2005

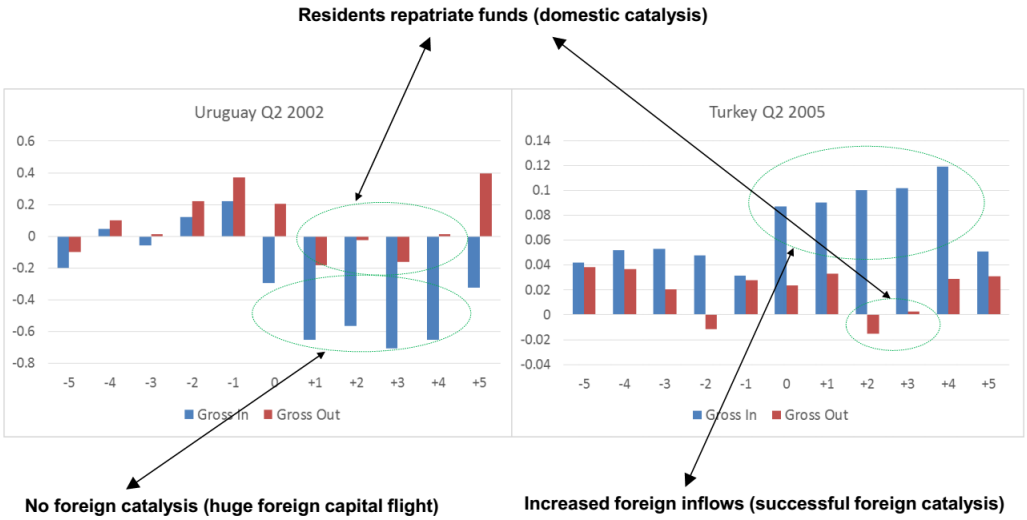

FIGURE 2. Gross Flows and IMF programs

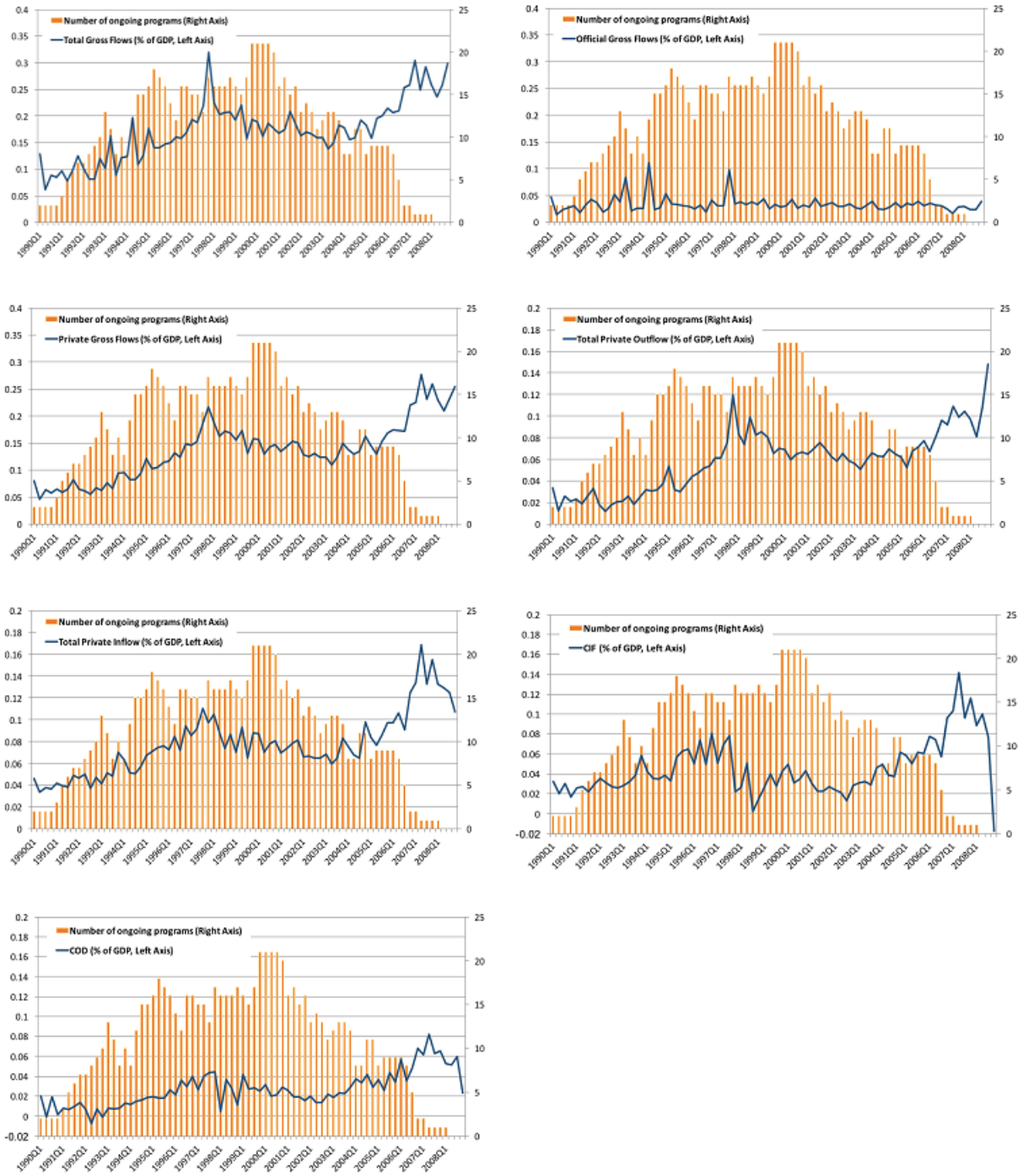

FIGURE 3. Total and Private Gross Flows: IRFs to an IMF program

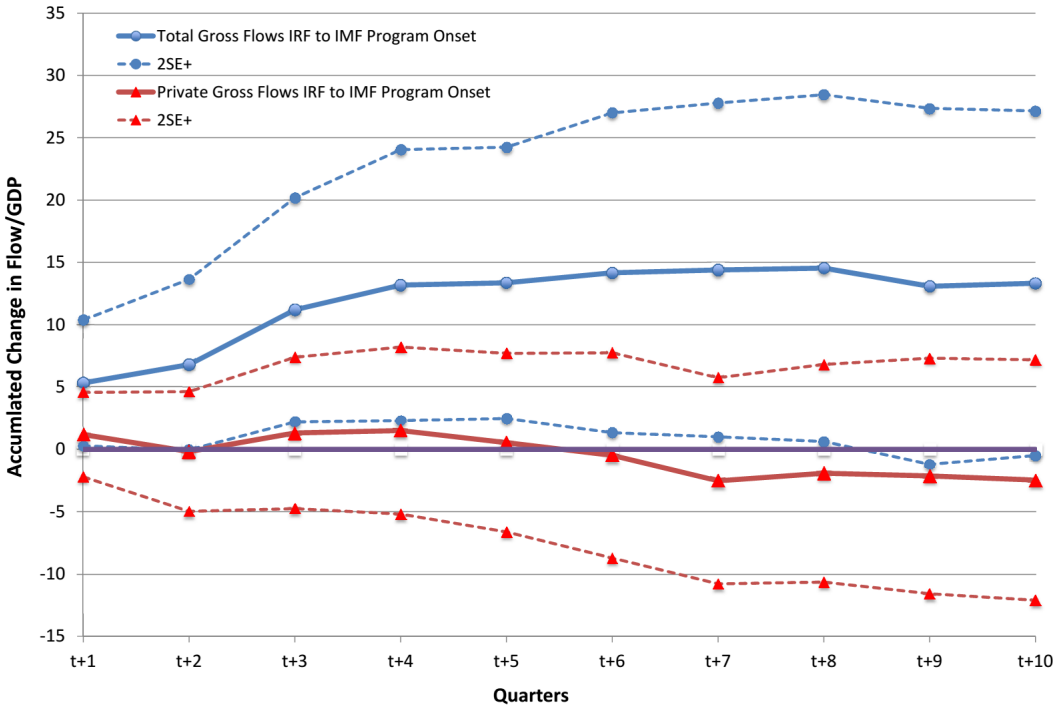

FIGURE 4. CIF and COD: IRFs to an IMF program

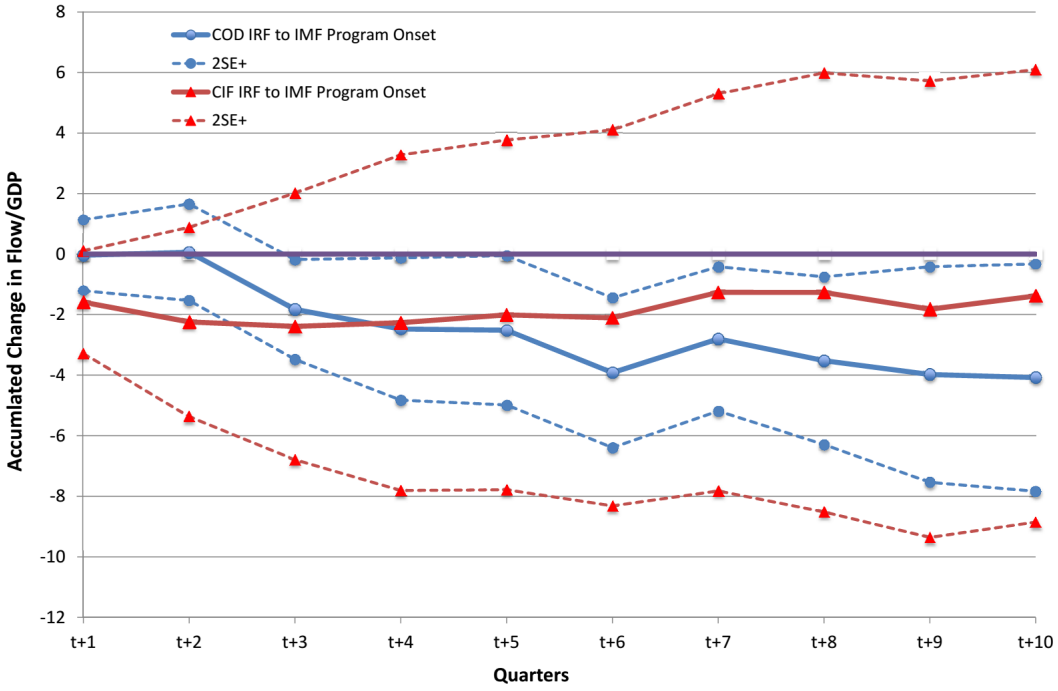

FIGURE 5. FDI-related CIF and COD: IRFs to an IMF program

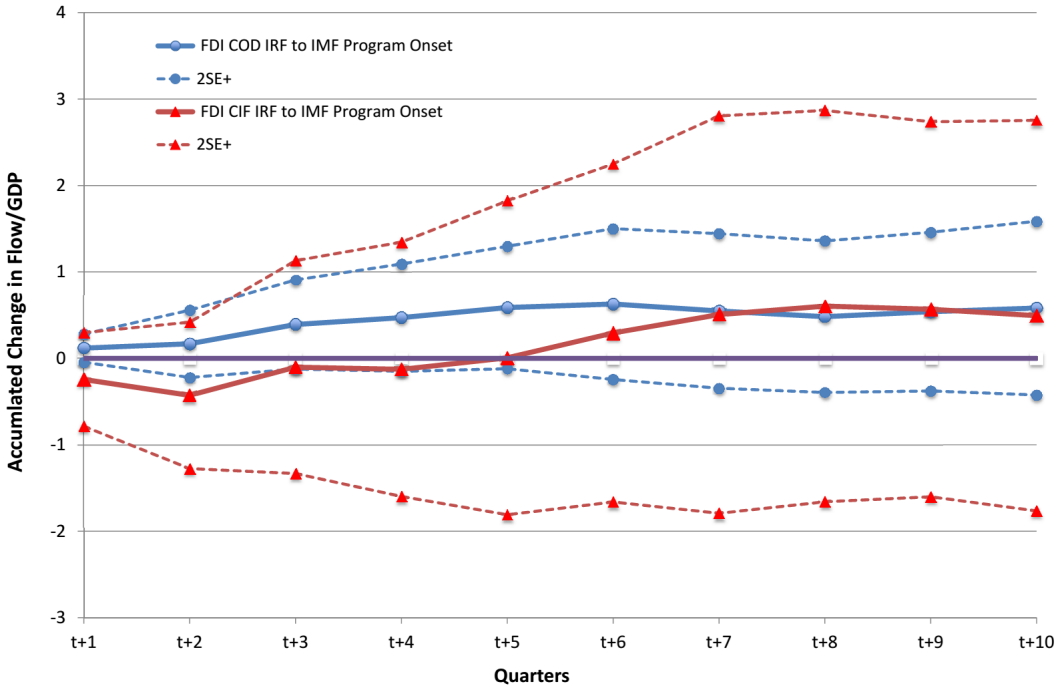

FIGURE 6. Portfolio investment-related CIF and COD: IRFs to an IMF program

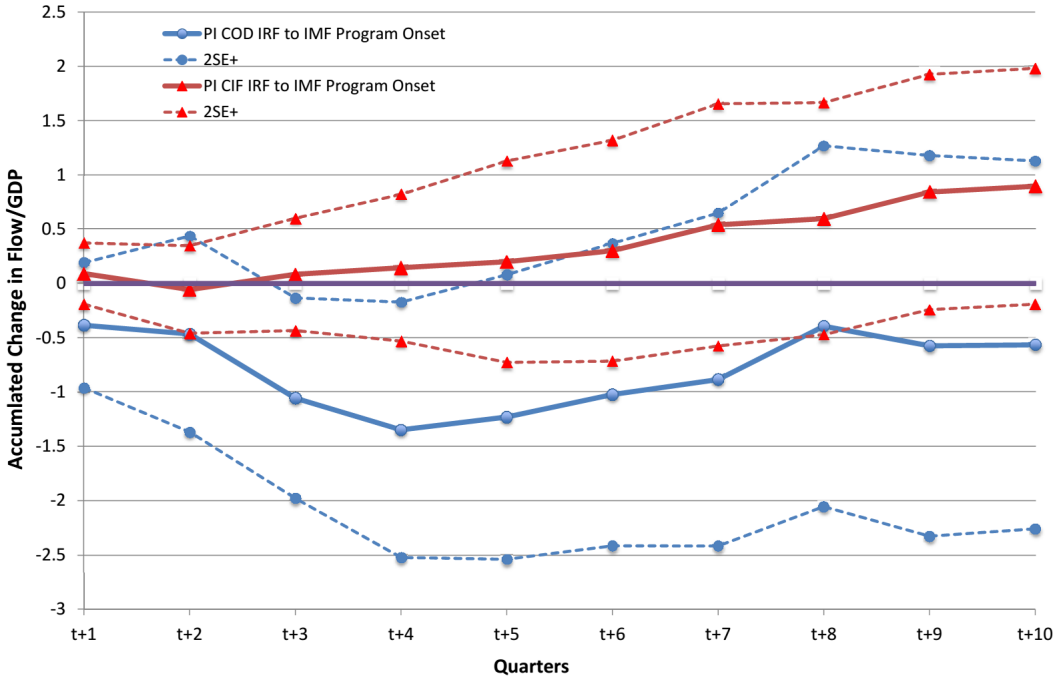

FIGURE 7. Other investment-related CIF and COD: IRFs to an IMF program

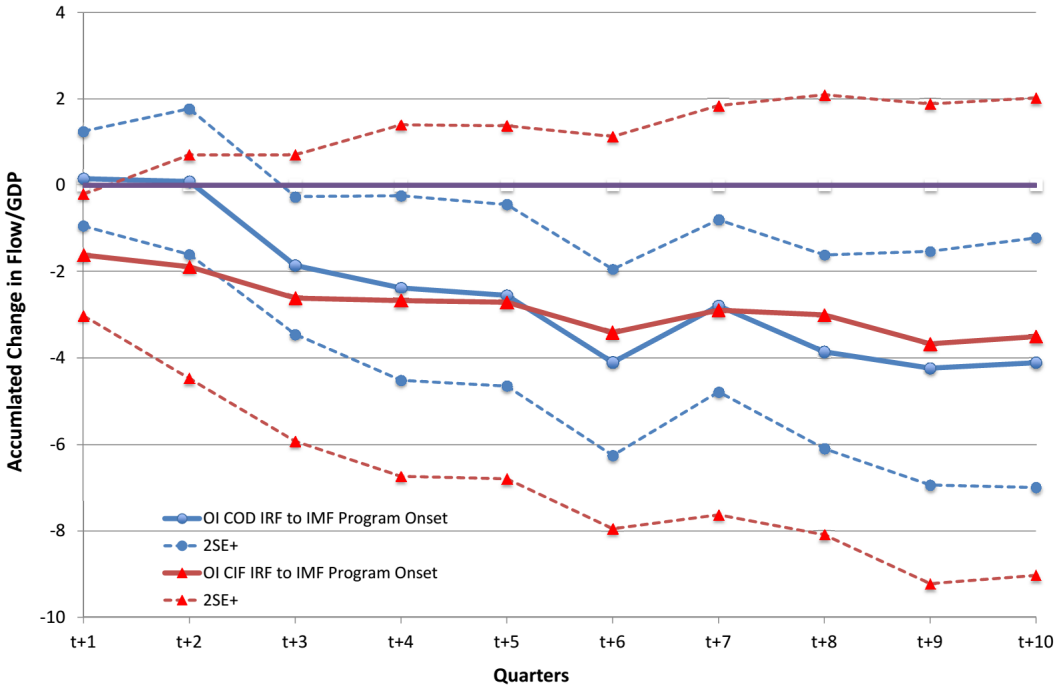

FIGURE 8. CIF and COD: IRFs to an IMF program. Instrumental Variables

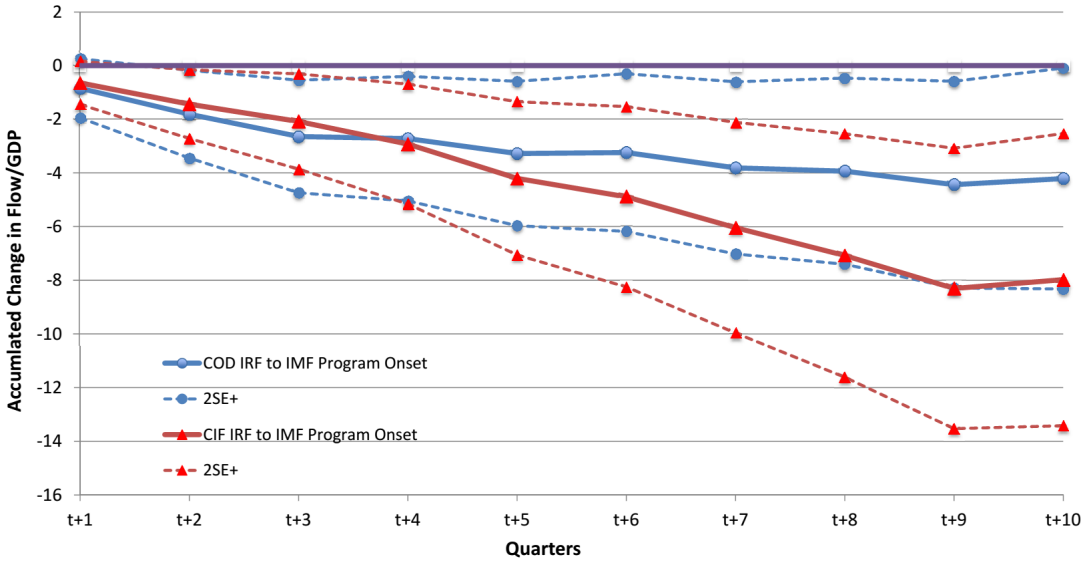

FIGURE 9. COD IRFs by type of IMF program.

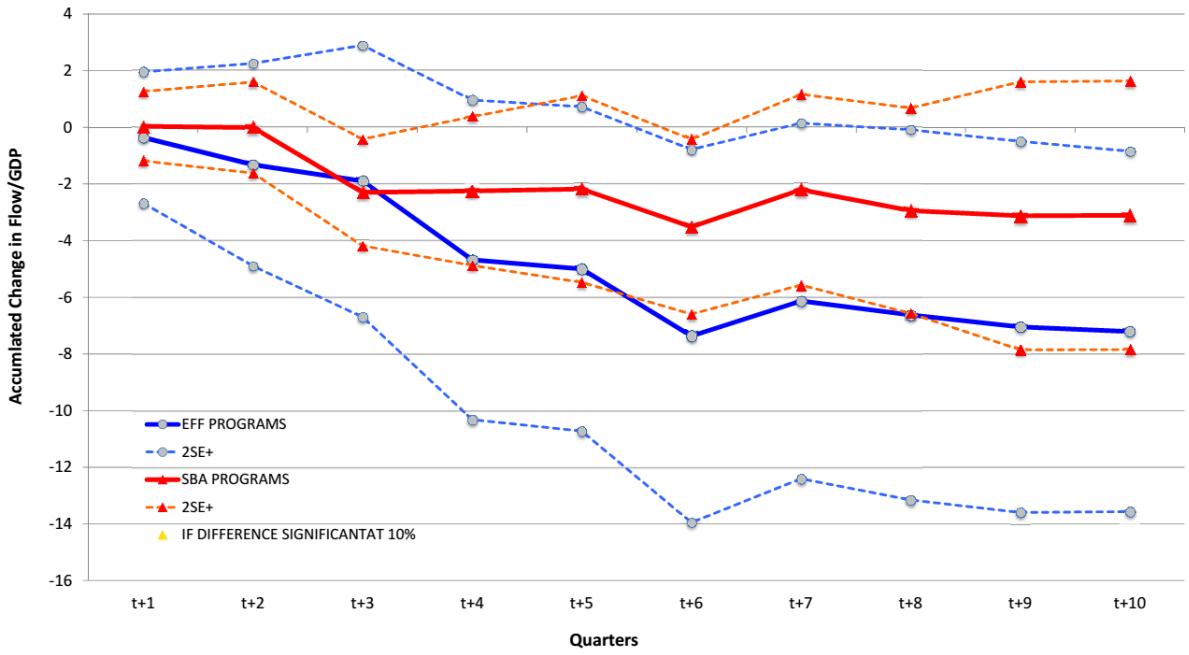

FIGURE 10. CIF IRFs by type of IMF program.

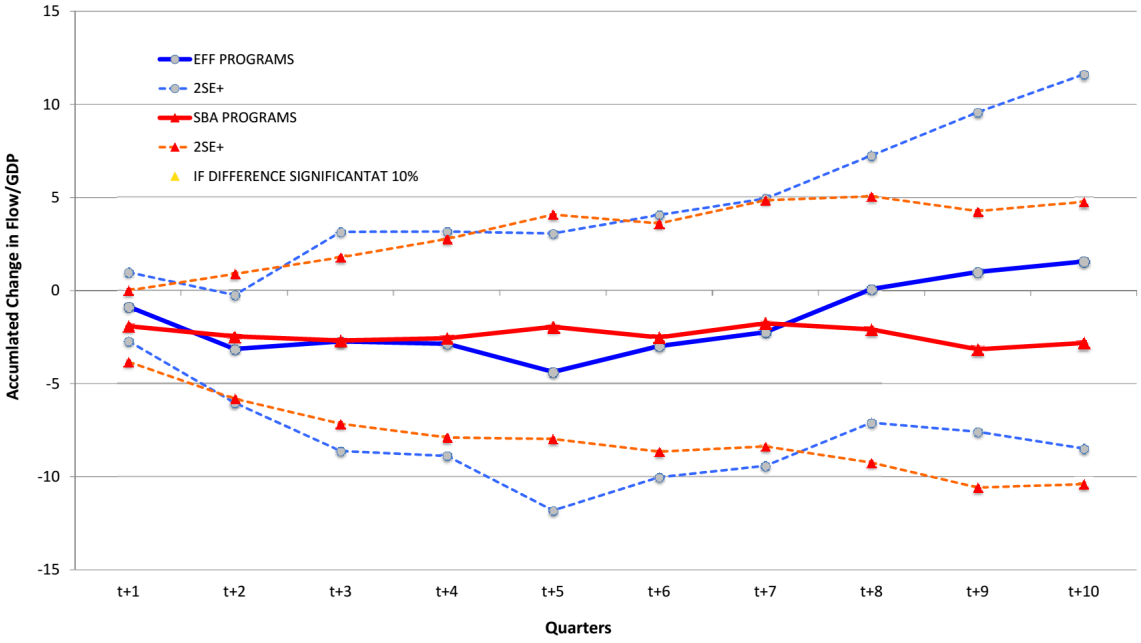

FIGURE 11. COD IRFs during crises.

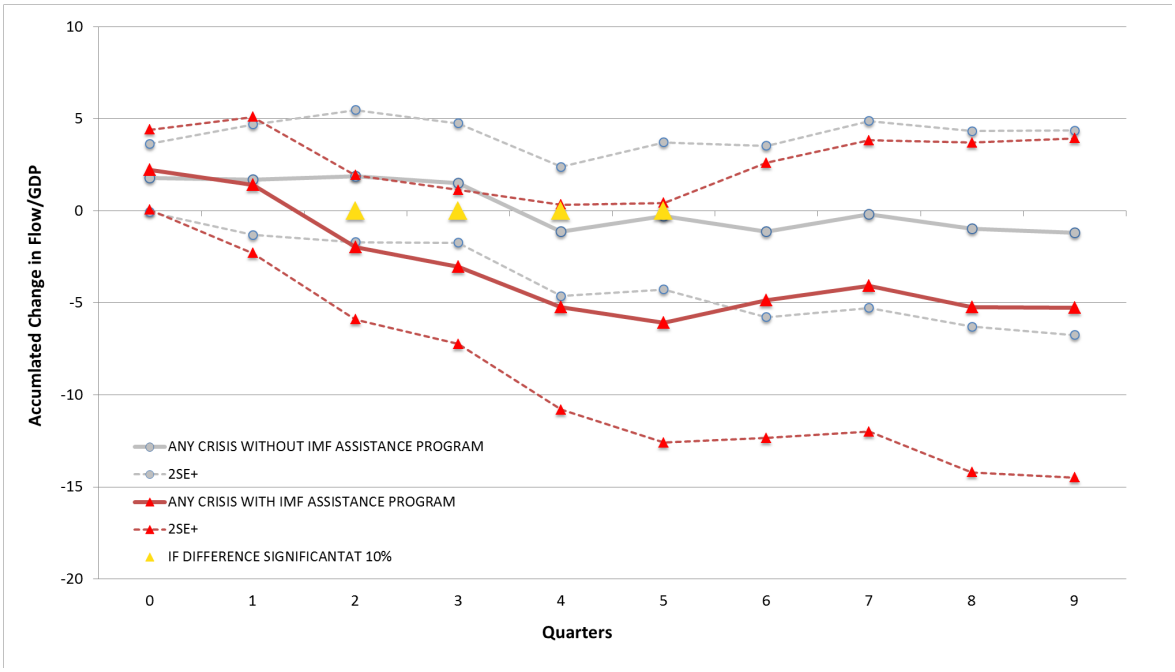

FIGURE 12. CIF IRFs during crises.

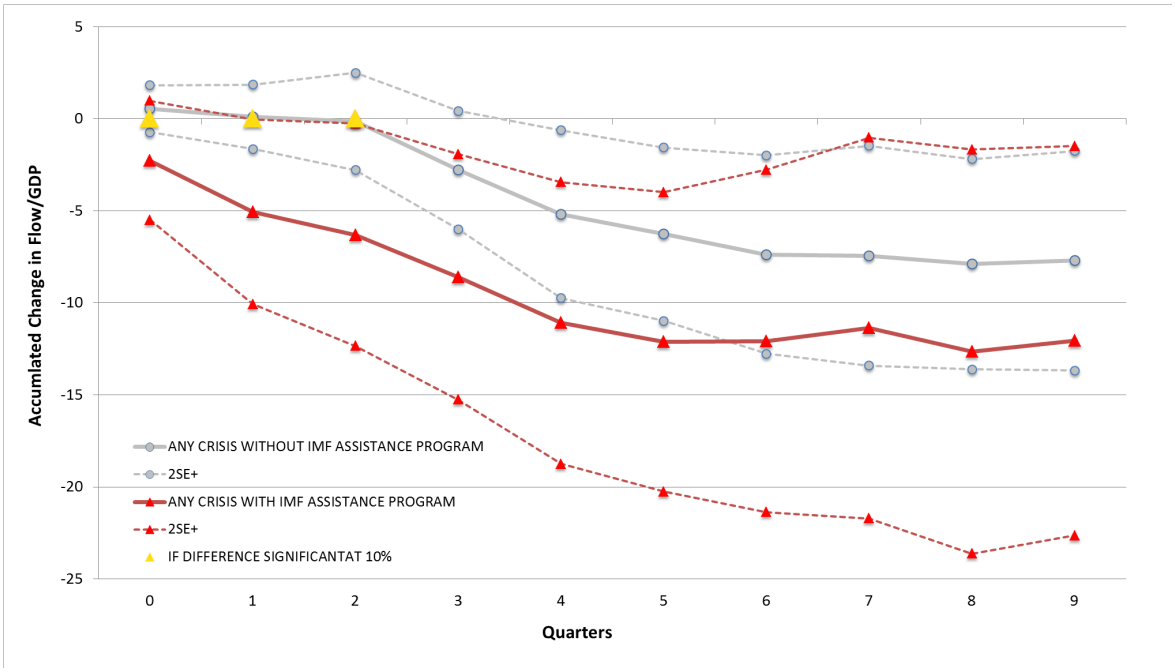

FIGURE 13. CIF and COD IRFs during all, global and local crises. Candles

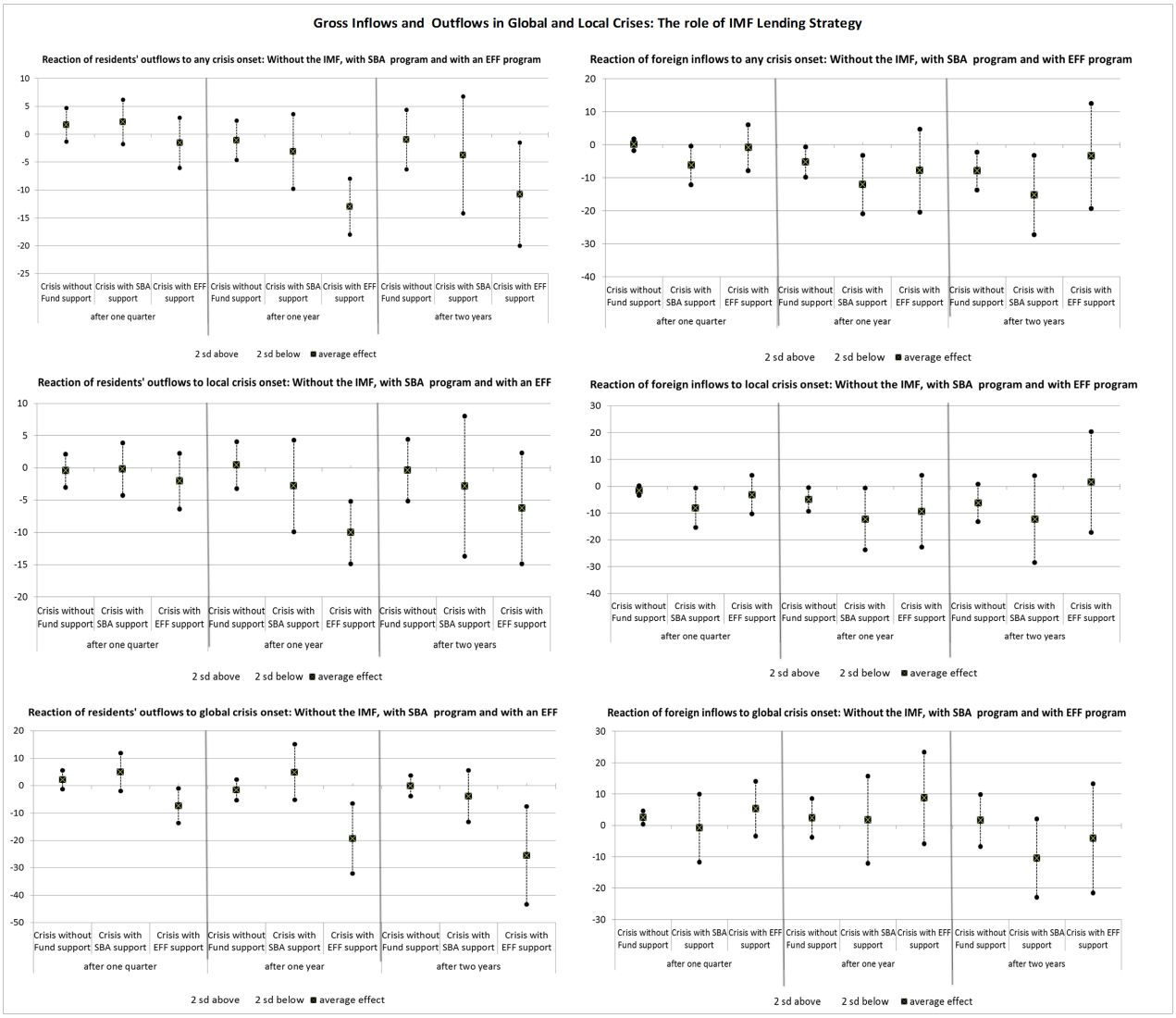

FIGURE 14. CIF COD IRFs during currency, banking and sovereign debt crises. Candles.

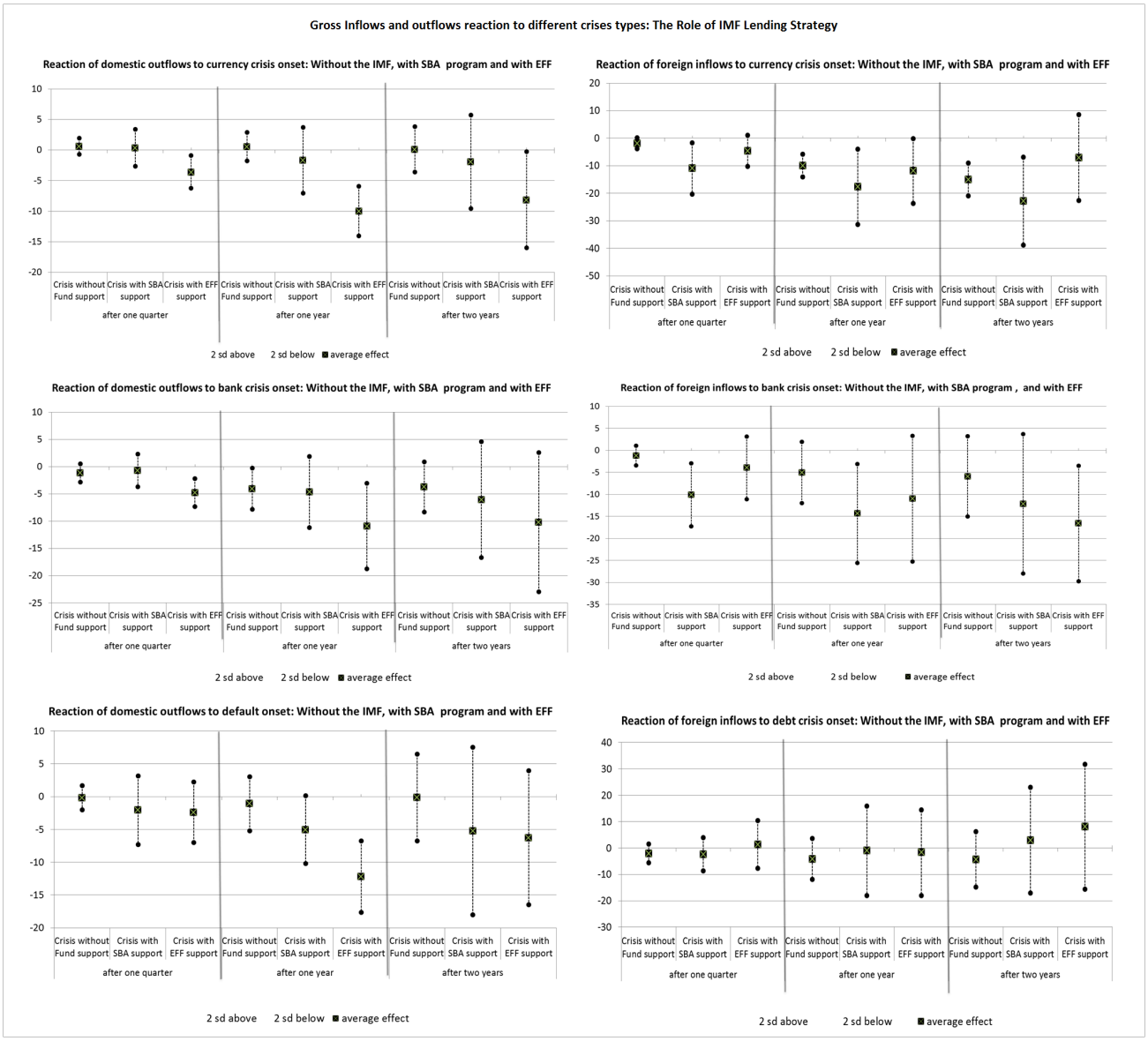

Table 1: IMF Programs. Summary Statistics.

Variable	Observations	Mean	Std. Dev	Min	Max
IMF Dummy	4332	0.231	0.421	0	1
IMF Program Size (SDR Mill)	147	1318.1	3229.9	11.6	22821.1
IMF Program Size (Relative to Quota)	147	121.7	223.8	15	1938.5
IMF Program Duration (Months)	147	20.6	10.2	5	49

Table 2: Transition probability Matrix for Ongoing Fund Programs

Origin/End	0	1	Total
0	96.79	3.21	100
1	10.71	89.29	100
Total	76.68	23.32	100

Table 3: IMF programs and economic crises.

	Total Programs	Programs per Country	Countries with Programs
IMF program Total	147	3.77	39
IMF program during Any Crisis	83	2.59	32
IMF program during Currency Crisis	51	1.89	27
IMF program during Banking Crisis	41	1.78	23
IMF program during Sovereign Dom. Crisis	15	1.67	9
IMF program during Sovereign External Crisis	36	2.25	16

Table 4: Gross capital flows and control variables. Summary Statistics.

Variable	Observations	Mean	Std. Dev.	Min	Max
Total Gross Flows	2574	0.28	0.28	0.013	2.795
Private Gross Flows over GDP	2574	0.231	0.261	0	2.54
Official Gross Flows over GDP	2574	0.047	0.093	0	2.661
Inflows from Foreigners (CIF)	2574	0.069	0.107	-0.534	0.954
Outflows from Residents (COD)	2574	0.045	0.171	-2.038	2.537
FDI flows over GDP	2574	0.054	0.085	0	1.787
Portfolio Investment flows over GDP	2574	0.036	0.076	0	1.606
Other Investment flows over GDP	2574	0.139	0.178	0	1.969
Private Outflows from Liabilities	2574	0.028	0.048	0	0.626
Private Inflows from Liabilities	2574	0.098	0.103	0	1.056
Private Outflows from Assets	2574	0.075	0.164	0	2.537
Private Inflows from Assets	2574	0.029	0.078	0	2.064
Federal Reserve Funds Rate	2574	4.105	1.951	0.14	8.32
Real Output Growth (Quarter to Quarter)	2514	0.076	0.121	-1.633	0.34
High Yield Index	2574	446.932	153.475	131.58	705.29
Capital Openness Index	2574	0.506	0.336	0	1
VIX	2574	20.236	7.297	11.19	51.723

Table 5: Effect of IMF programs on Gross Capital Flows. LSDV Estimation.

VARIABLES	CU	TGF	PGF	FOREIGNERS INFLOWS	RESIDENTS OUTFLOWS
IMF (t-1)	2.02	-0.27	-2.61	-1.85	-0.62
	(0.78)***	(1.83)	(1.05)**	(0.92)**	(0.89)
IMF (t-2)	1.77	3.03	1.26	-0.76	-2.34
	(0.8)**	(1.92)	(1.69)	(1.01)	(1.03)**
IMF (t-3)	0.91	1.42	0.11	-1.16	-0.92
	(0.73)	(2.59)	(1.75)	(1.19)	(1.08)
IMF (t-4)	0.99	-0.43	-1.07	-1.92	-0.95
	(0.71)	(1.84)	(1.42)	(1.2)	(0.8)
Total IMF Effect	5.69**	3.74	-2.31	-5.7*	-4.82**
Real GDP growth (t-1)	8.65	-39.06	-33.2	17.17	-6.99
	(4.32)**	(8.76)***	(7.42)***	(4.01)***	(4.37)
Real GDP growth (t-2)	-9.56	19.42	23.11	-2.74	3.31
	(3.42)***	(14.27)	(9.22)**	(4.47)	(6.92)
Real GDP growth (t-3)	3.64	9.09	2.83	-8.15	1.29
	(3.16)	(16.12)	(11.45)	(4.45)*	(5.95)
Real GDP growth (t-4)	-9.06	-12.62	-4.5	15.04	-4.63
	(2.95)***	(10.41)	(9.11)	(3.91)***	(4.19)
High Yield Index	-0.03	-0.04	-0.01	0.1	0.08
	(0.01)***	(0.04)	(0.03)	(0.03)***	(0.03)***
FED Funds Rate (t-1)	-2.25	-0.62	-0.37	3.05	3.49
	(1.08)**	(3.0)	(2.72)	(1.9)	(3.15)
Any crisis dummy (t-1)	1.58	4.16	1.52	-1.85	-0.17
	(0.84)*	(1.55)***	(1.61)	(0.94)**	(0.91)
KA Openness (t-1)	-3.72	9.95	9.61	5.02	1.88
	(2.62)	(4.21)**	(4.16)**	(3.1)	(1.68)
VIX Index (t-1)	-0.39	0.83	0.44	0.09	0.1
	(0.17)**	(0.45)*	(0.41)	(0.33)	(0.42)
TIME TREND	YES	YES	YES	YES	YES
YEAR EFFECTS	YES	YES	YES	YES	YES
Observations	2,374	2,430	2,430	2,430	2,430
Number of Countries	43	44	44	44	44
Adjusted R-squared	0.138	0.155	0.214	0.235	0.102

Robust standard errors in brackets. *** p<0.01, ** p<0.05, * p<0.1. CU stand for the current account, TGF for total gross flows and PGF for private gross flows. Gross inflows and outflows refer to the flows by direction. CIF stands for foreigner inflows and COD for residents' outflows. Finally, KA Openness refers to the Chin-Ito Index.

Table 6a: IV Estimation (first stage): Determinants of IMF lending.

Variables		IMF presence	IMF presence	IMF presence	IMF presence
Domestic politics	**Dictatorship dummy**	-0.1216	-0.1162	-0.1071	-0.1082
		[0.025]***	[0.026]***	[0.026]***	[0.026]***
	Elections dummy	-0.0118	-0.0121	-0.0112	-0.0115
		[0.006]**	[0.006]**	[0.006]**	[0.006]**
Geo-politics	**Presence in UN Security Council**		0.0185	0.0205	0.0199
			[0.011]*	[0.011]*	[0.011]*
	Alignment with the US at UN voting		0.5029	0.5351	0.539
			[0.266]*	[0.260]**	[0.268]**
Official sector politics	**Paris Club deal dummy**			0.3092	0.3108
				[0.053]***	[0.053]***
	ODA provided by the US			14,348	16,639
				[0.427]***	[0.368]***
IMF internal politics	**Quota at the IMF**				0.0096
					[0.033]
Observations		3,849	3,777	3,767	3,767
Number of countries		57	56	56	56

Standard errors in brackets. *** p<0.01, ** p<0.05, * p<0.1. All regressions also include also four lags of real GDP growth, the high yield index, Federal funds rate, Chinn-Ito Index and a crisis dummy.

Table 6b: IV Estimation: Second Stage.

VARIABLES	CU	TGF	PGF	FOREIGNERS INFLOWS	RESIDENTS OUTFLOWS
IMF IV (t-1)	4.57	-1.09	-7.6	-5.08	-0.75
	(1.83)**	(4.51)	(2.71)***	(1.93)***	(2.24)
IMF IV (t-2)	4.22	-0.86	-1.59	-4.19	-6.15
	(2.12)**	(3.87)	(3.66)	(2.37)*	(2.31)***
IMF IV (t-3)	2.54	-1.21	-2.01	-3.93	-3.19
	(1.68)	(5.48)	(3.92)	(2.53)	(2.1)
IMF IV (t-4)	1.56	-0.32	-2.93	-6.99	-1.58
	(1.72)	(4.92)	(3.29)	(2.65)***	(2.17)
Total IMF Effect	12.89**	-3.47	-14.13	-20.2***	-11.67**
Controls	YES	YES	YES	YES	YES
Time trend	YES	YES	YES	YES	YES
Year effects	YES	YES	YES	YES	YES
Observations	2,302	2,354	2,354	2,354	2,354
Number of Countries	43	44	44	44	44
Adjusted R-squared	0.138	0.152	0.213	0.247	0.105

Robust standard errors in brackets. *** p<0.01, ** p<0.05, * p<0.1. CU stand for the current account, TGF for total gross flows and PGF for private gross flows. Gross inflows and outflows refer to the flows by direction. Finally, foreigner inflows is CIF and residents' outflows is COD. Controls included are the same as in table 4.

Table 7: Disaggregating by type of flow.

VARIABLES	FDI INFLOW	FDI OUTFLOW	PI INFLOW	PI OUTFLOW	OI INFLOW	OI OUTFLOW
LSDV ESTIMATION						
Total IMF Effect after 4 quarters	-1.28	1.25	-0.3	-1.2	-5.08*	-5.43**
Observations	2,374	2,322	2,386	2,366	2,374	2,430
Number of Countries	43	42	43	43	43	44
Adjusted R-squared	0.108	0.138	0.0881	0.0431	0.207	0.0443
IV ESTIMATION (SECOND STAGE)						
Total IMF Effect after 4 quarters	-7.88*	2.34	-2.3	-1.65	-15.32***	-12.1**
Observations	2,302	2,254	2,314	2,294	2,302	2,354
Number of Countries	43	42	43	43	43	44
Adjusted R-squared	0.119	0.134	0.0897	0.0414	0.214	0.0478
Controls	YES	YES	YES	YES	YES	YES
Time trend	YES	YES	YES	YES	YES	YES
Year effects	YES	YES	YES	YES	YES	YES

Robust standard errors in brackets. *** p<0.01, ** p<0.05, * p<0.1. Controls included are the same as in table 4.

Table 8: Validity of the Instrumental Variables approach.

COD/Period	t	t+1	t+2	t+3	t+4	t+5	t+6	t+7	t+8
Underidentification test [1]	28.4	28.12	28.33	28.72	29.03	29.3	29.62	29.82	30.09
P-Value	0	0	0	0	0	0	0	0	0
Weak identification test [2]	9	8.88	8.89	8.85	8.85	8.83	8.82	8.77	8.72
Overidentification test [3]	5.02	6.69	12.18	11.55	11.09	14.13	17.41	21.72	24.35
P-Value	0.29	0.15	0.02	0.02	0.03	0.01	0	0	0
AR [4] test P-Value	0.23	0.02	0	0	0	0	0	0	0

CIF/Period	t	t+1	t+2	t+3	t+4	t+5	t+6	t+7	t+8
Underidentification test [1]	28.1	28.01	28.18	28.64	29	29.56	30.16	30.71	30.86
P-Value	0	0	0	0	0	0	0	0	0
Weak identification test [2]	9.1	8.99	8.99	8.96	8.96	9.01	9.07	9.09	9.01
Overidentification test [3]	23	30.48	31.59	35.28	36.11	36.05	32.83	26.92	16.82
P-Value	0	0	0	0	0	0	0	0	0
AR [4] test P-Value	0.02	0	0	0	0	0	0	0	0

[1] Kleibergen-Paap rk LM statistic, [2] Kleibergen-Paap rk Wald F statistic, [3] Hansen J statistic (all instruments), [4] Anderson-Rubin Test.

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