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Capital Flows, Exchange Rate Regime, and Macroeconomic Performance in Mexico

CARLOS A. IBARRA*

INTRODUCTION

The resurgence of private capital flows to developing countries has been a key issue in the latest debates about the choice of exchange rate regime. This is perhaps most evident in the vast literature prompted by the currency crises of the 1990s. But there has also been a concern for the short-term stabilizing properties of alternative regimes, given the observed volatility of foreign investment even in non-crisis situations (see: *e.g.*, Gavin *et al.*, 1996; Galindo and Izquierdo, 2003).

Flexible exchange rates can be a useful tool to deal with the volatility of capital flows. They facilitate the necessary adjustment in relative prices and the current account balance after a change in the availability of foreign resources (see: *e.g.*, Hausmann *et al.*, 1995; or more recently Rodrik, 2001).

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* Departamento de Economía, Universidad de las Américas, Puebla, Cholula, Pue., México, <carlos.ibarra@udlap.mx>. Thanks to two anonymous referees for their detailed comments and suggestions on a previous version of this paper, and to seminar participants at WIDER, LACEA 2003 and the University of Westminster. Financial support from Conacyt, CESEP (UDLA, Puebla) and WIDER is gratefully acknowledged. This paper appeared previously as WIDER Research Paper 2004/27.

And they do so without the loss of credibility typically entailed by a government's decision to discretely devalue the currency within the rules of a fixed but adjustable peg system. In addition, flexible rates give domestic monetary authorities the possibility to actively engage in stabilization policies.

The recent wave of crises in developing countries has shown, however, that exchange rate fluctuations can be harmful for an economy with large amounts of uncovered debt (see: Calvo and Reinhart, 2002; Eichengreen and Hausmann, 1999). A (real) currency depreciation, in particular, tends to erode the balance sheet position of firms carrying debts denominated in a foreign currency; this reduces their ability to obtain credit and, if strong enough, may even result in widespread bankruptcy. Difficulties in the corporate sector can thus extend to banks. Since fixed rates also have obvious shortcomings as part of the adjustment process to fluctuations in foreign investment, skeptical views are beginning to emerge regarding the stabilizing properties of alternative exchange regimes by themselves (see: Calvo and Mishkin, 2003; Devereux and Lane, 2003).

Among developing countries, Mexico became a major destination for international capital flows in the early 1990s. As is well known, these flows can be a source of large macroeconomic shocks. In the case of Mexico, they have at times reached levels of more than 10% of Gross Domestic Product (GDP).[1] (See: Ros and Bouillon, 2002.) The composition of flows has changed over time. Initially, in the context of a system characterized by a semi-fixed exchange rate between the Mexican peso and the US dollar, foreign investment in the bond and stock markets was by far the most dynamic component.

The North American Free Trade Agreement (NAFTA) of 1994, and the shift to a floating exchange regime forced by a currency crisis in December

[1] Bosworth (2002, figure 1) shows, however, that, despite the recent boom, capital flows (as a proportion of GDP) to developing economies in Latin America and Asia have been at most of a magnitude similar to that of flows to OECD countries.

of that year, marked the beginning of a new period, in which foreign direct investment (FDI) became again the most significant source of foreign capital. Other types of flows have been comparatively small in cumulative terms, mirroring what appears to be a trend among developing countries (see: Levy-Yeyati *et al.*, 2002). However, they have been quite volatile, and on a given quarter they can be as large as FDI.

Given this background, the purpose of this paper is to study the short-term effects of capital flows on aggregate demand in Mexico, and to determine whether the sign or intensity of these effects has depended on the type of exchange rate regime in operation. In addition, we are interested in identifying some of the specific channels through which capital flows have affected domestic demand.

Early in the analysis, total capital flows were separated into two components: FDI and the rest. The presumption was that, given their different nature (in terms of degree of volatility and their specific transmission channels to the rest of the economy), their impact on aggregate demand would also be different. This presumption was later on validated, in the sense that it was not possible to find a significant short-run effect of FDI on aggregate demand.[2] For this reason, this paper focuses on the macroeconomic impact of non-FDI flows only.

Other aspects of the approach followed in the paper can be noted. First, on the demand side a distinction is made between consumption and investment. This decision was originally motivated by the well known fact that these two components of aggregate demand differ significantly in their degree of volatility. As will become clear throughout the paper, this separation yielded interesting results.

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[2] This result obtained even during the floating period, despite the concurrent rise of acquisitions (as opposed to greenfield investments) in total FDI pointed out by Ffrench-Davis and Ocampo (2001) for Latin America in general, and by Mattar *et al.* (2002) for Mexico. It could have been expected that acquisitions had a significant effect on aggregate demand to the extent that they are intermediated by domestic financial markets (see: *e.g.*, Trigueros' (1998) discussion of the Mexican case).

Second, the sample was divided into two basic periods: 1990Q1-1994Q3, when the country had a semi-fixed exchange rate system (initially a crawling peg, which was replaced in November of 1991 by an explicit band with a fixed floor, a crawling ceiling, and a very narrow intervention band); and 1995Q1-2002Q2, characterized by the existence of a floating regime. In the rest of the paper, these will be referred to simply as the band and floating periods.[3]

Finally, to focus on short-term effects, the series used in the analysis were de-trended, using a Hodrick-Prescott filter (lambda=1 600); after this, quarter effects were removed by means of a regression with a constant and quarterly dummies. Table 2 on volatility is the exception, where it was decided to use the original data to calculate the coefficients of variation.

The rest of the paper is organized as follows. Section 1 has two parts. The first describes the evolution of capital flows to Mexico, looking for potential breaks after the introduction of the floating system. The second part brings in aggregate demand. It shows that after the shift to float, there was a rise in the volatility of both non-FDI flows and demand. The link between these two variables in the new regime has evolved differently depending on the specific component of demand: the correlation of capital flows with consumption has persisted, and may have even become stronger in comparison with the band period; in contrast, the correlation with investment has tended to vanish, particularly as the crisis period and its aftermath are left behind.

Section 2 uses regression analysis to explore more formally the transmission of variations in capital flows to domestic demand. The analysis confirms that while the effect of capital flows on consumption has become stronger in the new regime, the effect on investment is no longer significant. It also identifies the real exchange rate and the stock market price index as

[3] The floating system was introduced in December of 1994, after the band regime collapsed under a series of speculative attacks against the peso. As explained below, the ensuing crisis period (1994Q4-1995Q4) is kept separated in much of the analysis.

important transmission channels for capital flows. Section 3 presents the conclusions. It is remarked that since the real exchange rate and stock market prices are major determinants of investment, the observed fall in their correlation with capital flows may explain, at least in part, the detachment of investment from capital flows during the floating period.

The Evolution of Capital Flows and Aggregate Demand

The precise delimitation of the regime periods used in this paper may require some explanation. The surge in non-FDI flows to Mexico started around the first quarter of 1990, which defines the first observation in our sample.[4] The actual shift to float took place in the final days of December of 1994, in the early stage of what would later become a full-blown macroeconomic crisis. There was strong financial instability both before and after the floatation of the currency, and for some time fiscal and monetary policies were oriented basically toward the goal of stabilizing the domestic financial markets. This, and in general the adjustment to the reversal of capital flows ended up causing a dramatic fall in aggregate demand precisely as the new exchange system was being implemented.

An assessment of the relative performance of the semi-fixed and floating regimes should probably leave the crisis observations aside, but there is the question of when exactly to mark the start and end of the crisis. It seems sensible to let the last quarter of 1994, when a very large decline in non-FDI flows took place, to mark the beginning of the crisis period.

Identifying the end is more problematic. After a strong currency depreciation following the abandonment of the band system, stability in the exchange market was restored toward the end of the first quarter of 1995. Other variables suggest a longer period of abnormally bad economic

[4] The late 1980s were a period of strong macroeconomic instability, with annualized inflation rates of more than 100% during most of 1987 and 1988.

performance: the nominal interest rate, for instance, reached a peak of 60.4% in the second semester (followed by a maximum level of 48.7% in the inflation rate two quarters later), while aggregate consumption and investment were still experiencing declines in absolute terms in the third quarter. Given these observations, it was decided to mark the end of the crisis period in the fourth quarter of 1995.

Another issue is the 2001 acquisition of Banamex, one of Mexico's largest banks, by Citigroup (see: CEPAL, 2002). As a result of this operation, FDI recorded an extremely large positive value (more than 10 standard deviations from the floating period mean) in the third quarter of that year; something similar happened to non-FDI flows, but with a negative sign. This single observation has a large influence on the estimated levels of volatility of capital flows (as shown below, in table 2, by the alternative coefficients of variation) and their correlation with other macroeconomic variables. For this reason, the correlation coefficients presented below were calculated for a sample ending in the second quarter of 2001, while the regression analysis of the next section, using a larger sample period, includes a dummy that takes a value of one in the third quarter of that year.

Capital flows

As explained before, in this paper capital flows to Mexico are split into two parts, namely, FDI and other types of investment. The latter category corresponds to the overall capital account balance net of direct investment (KANDI), and consists generally of bond and stock market investments, and bank loans (the precise definition of all variables used in the paper can be consulted in table 1).[5]

[5] Mexican balance of payments data, as reported by Banco de México, shows zero Mexican direct investment abroad, except for the second and third quarters of 2001. These two observations are included in the KANDI series.

Figure 1 presents the evolution of capital flows since 1985. It does so in terms of the average value of FDI and KANDI for different sub-periods: the second half of the 1980s, before the capital surge; and the periods of band (1990Q1-1994Q3), crisis (1994Q4-1995Q4), and floating (1996Q1-2002Q2). Table 2, on the other hand, presents basic descriptive statistics (mean, standard deviation, and coefficient of variation) for a set of macroeconomic variables used throughout the paper, distinguishing again between the band and floating periods.

A first characteristic of Mexico's recent experience is that the relative importance of the different types of foreign investment[6] has changed over time, with significant brakes in 1990 (when large amounts of private capital started flowing in), and again after the currency crisis of December 1994. As figure 1 shows, toward the end of the 1980s FDI was the only significant source of foreign capital for the country; in fact, KANDI was negative on average. This situation changed after 1990 when, despite a doubling in the size of average FDI, other types of investment became the most dynamic component of total inflows, by far. As a result, during the band period KANDI came to represent 69% of the overall capital account surplus; 52.2% of these inflows corresponded to bond market investments, 27.7% to stock purchases, and 20.7% to bank loans.[7]

This trend was interrupted by the crisis of late 1994 and 1995 when, in a context of steady FDI expansion, other types of investment practically came to a halt. Even after the crisis was overcome, non-FDI flows have remained a secondary source of foreign resources for the country. For instance, during the 1996Q1-2002Q2 period, KANDI registered a quarterly average value of only 0.8 billions of dollars, well below the 3.1 billions of FDI (see again: figure 1).

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[6] In this paper, the term foreign investment is used in a wide sense, including not only direct and portfolio investments but also bank loans.

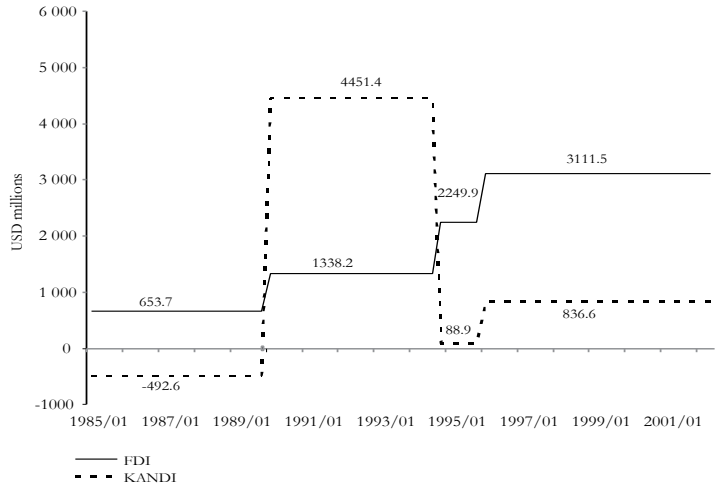
[7] These figures exclude the second quarter of 1992, when the total amount was negative because of large loan repayments.

TABLE **1**
Definition of Variables

KA	Capital account balance (central bank's definition), in USD billions[a]
FDI	Direct investments by foreign firms in Mexico, in USD billions[a]
KANDI	Capital account balance less FDI, in USD billions[a]
CONS	Total private consumption, in billions of pesos at 1993 prices[b]
INVEST	Total investment, in billions of pesos at 1993 prices[b]
GDP	Gross domestic product, in billions of pesos at 1993 prices[b]
NIR	Average nominal 28-day Treasury bill rate (Cete rate), in percent annual terms[a]
INF	4-quarter percentage variation in the consumer price index[a]
RIR	Real interest rate, calculated as NIR-INF
NER	Nominal spot exchange rate, pesos per dollar, for wholesale operations; average of daily quotations[a]
RER	Ratio between US and Mexican consumer price indexes, in a common currency[c]
RER2	Ratio between manufacturing and construction price indexes[b]
MB	Average of the end-of-month money base stock, divided by CPI and real GDP[d]
M1	Average of end-of-month money supply (coins outside banks plus deposits in checking and demand bank accounts), divided by average CPI and by real GDP[d]
SPI	Average of the minimum and maximum monthly values of the general price index for the Mexican Stock Exchange, divided by the CPI [e]
GOVD	Federal government total expenditure less total revenue, originally in millions of pesos, divided by GDP, in %[e]
FXRV	Variation in foreign exchange reserves, from the balance of payments, USD billions[a]
CA	Current account balance, in USD billions[a]

Source:
a/ Banco de México.
b/ Mexico's National Accounts System, National Institute of Statistics (INEGI).
c/ Source for US CPI: International Monetary Fund, IFS.
d/ Nominal monetary aggregates in millions of pesos, Banco de México.
e/ INEGI data bank.

FIGURE **1**
Foreign Capital Flows to Mexico, 1985Q1-2202Q2
(period averages)



Excludes 2001Q3.
Definition and source of variables, see table 1.

A second characteristic is that the volatility of capital flows has also changed over time, with an intensity and direction that depend on the type of flow (see: table 2). During the band period, the volatility of our two basic categories of foreign investment, measured by the coefficient of variation, was basically the same: 63.4% for FDI and 62.6% for KANDI. After the adoption of floating, the overall volatility of capital flows increased, as shown by the rise in the coefficient of variation of the capital account balance (KA), which changed from 49.7 to 64.3%. Actually, however, this upward shift is a summary of divergent tendencies between direct and the other types of investment: the coefficient of variation of FDI declined from 63.4 to 29.1%; meanwhile, the coefficient for KANDI rose from 62.6 to 288.4 percent.

These trends in volatility are an important part of Mexico's recent macroeconomic setting: although non-FDI flows have been relatively small on average, they can, on a given quarter, be as large as (or larger than) FDI. This is shown in figure 2, which presents the actual quarterly value of the FDI and KANDI flows since 1985 (as opposed to the period averages presented in figure 1).

Mexico's stylized facts can be put in an international context. A view widely held after the currency crises of the 1990s, is that systems with relatively fixed exchange rates tend to encourage excessive foreign portfolio investments because of an implicit government guarantee against currency risk. By removing such guarantee, floating regimes are expected to reduce the size of inflows.[8] In the light of the Mexican experience, it could be wondered whether the introduction of (greater) exchange rate flexibility has been a factor in making non-FDI flows not only smaller but also more volatile.

Table 3 summarizes the recent behavior of non-FDI flows to a group of large recipients of foreign capital in Latin America. It is apparent that the two basic characteristics of flows to Mexico, namely, a decline in average size and larger volatility, are shared by all countries. There is no simple connection with the exchange regime. Throughout our two reference periods, Argentina had a fixed exchange rate system, Brazil didn't shift from fixed to flexible until early 1999, Chile had a basically flexible rate –most of the time, within a crawling band–, and Peru a system of managed floating. In every case, though, there is a fall in the average size and an increase in the coefficient of variation as we move from the early to the late 1990s.

This evidence suggests that the currency uncertainty brought about by the introduction of a floating system is not a necessary condition for a reduction in the size or an increase in the volatility of capital flows.[9] But a

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[8] See: Furman and Stiglitz (1998) for an early discussion of this issue.

[9] Of course, this pattern is restricted to a small sample of countries during the recent period, and is only indicative of the possibility that the observed behavior of capital flows to Mexico, rather

basic question does remain, namely, to what extent has the floating system protected the real side of Mexico's economy from the observed fluctuations in capital flows?

TABLE **2**
Basic Macroeconomic Indicators

	Band period (90Q1-94Q3)			**Floating period (96Q1-02Q2)**		
	Mean	*SD*	*CV*	*Mean*	*SD*	*CV*
KA	5.7896	2.8793	49.73	3.9469	2.5358	64.25
KANDI	4.4514	2.7873	62.62	0.3887	3.2874	845.86
KANDI[a]				0.8366	2.4130	288.43
FDI	1.3382	0.8488	63.43	3.5494	2.4021	67.68
FDI[a]				3.1115	0.9046	29.07
CONS	874.71	54.92	6.28	1 020.30	106.95	0.48
INVEST	225.11	21.39	9.50	283.92	43.97	15.49
GDP	1 218.90	63.55	5.21	1 482.33	122.33	8.25
CONS[b]	4.3284	2.7426	63.36	4.7040	3.1854	67.72
INVEST[b]	8.1009	6.9464	85.75	9.4182	10.9631	116.40
GDP[b]	3.7962	1.5759	41.51	4.1672	3.1937	76.64
NIR	19.97	8.92	44.67	19.60	8.36	42.67
INF	16.83	7.76	46.10	16.44	10.30	2.66
RIR	3.1391	6.6522	211.91	3.1624	5.1962	164.31
NER	3.0560	0.1683	5.51	8.8699	0.8270	9.32
RER	12.6177	1.2063	9.56	13.0503	1.5544	11.91
RER2	10.9736	1.1872	10.82	9.0269	1.0883	12.06
SPI	369.00	122.62	33.23	399.51	46.62	11.67
MB	1.1776	0.0512	4.35	1.0827	0.1119	10.33
M1	3.2405	1.0083	31.11	3.3036	0.3125	9.46
FXRV	432.29	2 556.35	591.35	1 037.77	1 496.96	4.25
CA	–4 847.43	2 075.64	–42.82	–3181.64	1 713.43	–53.85

SD = Standard Deviation, CV = Coefficient of Variation, in %.
a/ Excluding the third quarter of 2001.
b/ In 4-quarter growth rates.
Definition of variables, see table 1.

than being a direct consequence of the choice of regime, is part of a broader international trend. To arrive at a more general result would require increasing the sample size and conducting a proper econometric analysis.

TABLE **3**

Non-FDI Flows to Latin American Countries [a]

	Mexico's band period				Mexico's floating period			
	Sample	*Mean*	*SD*	*CV*	*Sample*	*Mean*	*SD*	*CV*
Argentina	90Q1-94Q3	113.47	396.25	349.22	96Q1-01Q2	88.12	423.10	480.13
Brazil	90Q1-94Q3	46.74	495.66	1 060.58	96Q1-01Q4	–25.83	1 347.04	–5 215.89
Chile	91Q1-94Q3	145.63	170.17	116.85	96Q1-01Q3	61.37	338.71	551.90
Mexico	90Q1-94Q3	266.06	160.84	60.45	96Q1-01Q4	45.40	146.43	322.54
Peru	91Q4-94Q3	115.04	124.21	107.98	96Q1-00Q4	86.34	288.38	333.99

SD=Standard deviation, CV=Coefficient of variation, in %.

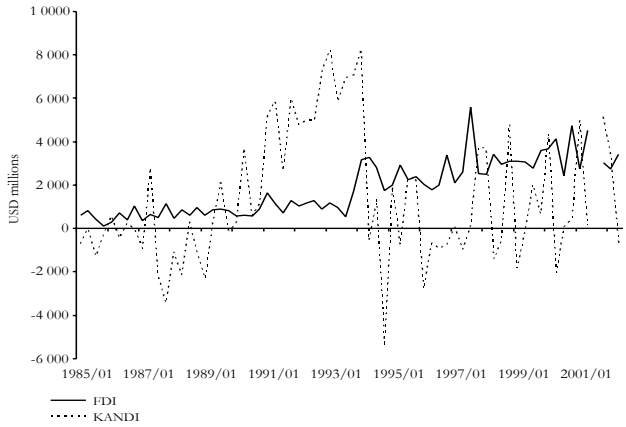
a/ Financial account balance less net foreign direct investment, IMF definitions.Original in USD millions. US CPI-deflated. Re-scaled such that the average for 1990Q1-2001Q4 (or available sample) equals 100.

Source: International Financial Statistics, IMF.

FIGURE **2**

Foreign Capital Flows to Mexico, 1985Q1-2202Q2

(quarterly observations)



Excludes 2001Q3.

Definition and source of variables, see table 1.

Aggregate Demand

There are important aspects of Mexico's macroeconomic performance that do not seem to depend on the particular choice of currency arrangements (see: table 2 for the following figures). Disinflation, for

instance, has been a constant across regimes. During the band period, the annual inflation rate descended gradually from above 25% in 1990 to less than 7% in 1994; in the same way, it declined from more than 30% in 1996 to below 5% in early 2002. The average inflation rate was also quite similar: 16.8 versus 16.4% per year.

The pace of economic growth does not change much between periods, either, once the crisis observations are excluded. In particular, the mean annual GDP growth rate (measured as the four-quarter variation in output) increased only slightly, from 3.8% to 4.2%, after the shift to float. Perhaps as a reflection of these similarities, the real interest rate showed the same level, of about 3.1%, across periods.

But besides these similarities, there are also important changes in macroeconomic performance as we move from band to floating. In particular, there is an increase in the volatility of (both the levels and the growth rates of) consumption and investment; unsurprisingly, the same pattern is shown by the GDP. The rise in aggregate demand volatility can be large. For instance, the coefficient of variation of consumption (in levels) increased from 6.28 to 10.48, or by 67 percent.

Table 4 presents the estimated correlation coefficients between (current and lagged) KANDI and a set of macroeconomic variables, again by sub-period. Only those coefficients that were statistically significant are included. As the table shows, there is a significant, positive correlation between aggregate consumption and non-FDI flows, which basically does not change in intensity (or sign) with the choice of exchange regime. In particular, the correlation coefficient between these two variables reached a level of 0.48 during the band period and a slightly higher of 0.51 in the float, in both cases involving the first lag of KANDI.

Although correlation does not imply causality, the fact that consumption is linked to past values of the capital flows suggests the existence of a causal relationship going from capital flows to consumption.[10] This implies

[10] An alternative explanation would be that *all* of the observed correlation arises because foreign investors correctly foresee, say, a reduction in consumption, and react to that expectation by

that the greater volatility of non-FDI flows would be transmitted to domestic consumption.[11] In contrast, the correlation between capital flows and investment demand has tended to vanish during the floating period.[12] This set of results motivates the regression analysis of the next section.

THE DETERMINANTS OF AGGREGATE DEMAND

The regression analysis in this section has two basic purposes: first, to confirm the existence of a significant effect of capital flows on domestic demand and a possible break after the shift to float, as suggested by the evidence provided by the correlation coefficients; and second, to identify some of the possible channels for the transmission of capital flows to aggregate demand.

The sample period is 1990Q1-2002Q2, and the sequence of analysis is as follows: the starting point is the estimation of a regression equation that includes as right-hand-side variables only the lagged value of the dependent variable (consumption or investment), a crisis dummy for 1994Q4-1995Q4, the capital flow variable (KANDI), and an interaction between the latter and a dummy for the floating period (1995Q1-2002Q2). The equation also includes BNX, a dummy that equals one in the third quarter of 2001 to isolate the spike in KANDI associated to the acquisition of Banamex by Citigroup.

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reducing in advance their positions in the country. However, the fact that the effect of capital flows on consumption tends to disappear after controlling for the influence of variables that presumably act as transmission channels, such as the exchange rate (see next section), lends support to the presumption that there is indeed a causal link running from foreign investment to domestic demand.

[11] This finding contradicts the possibility that capital flows stabilize consumption by acting as a bumper against fluctuations in domestic income, in line with the conclusions reached in previous studies (see: Prasad *et al.,* 2003 for references).

[12] More specifically, although table 4 shows that the correlation coefficient between these variables fell from 0.57 to 0.50 after the regime change, but remained significant, actually some exploration revealed that the correlation during the floating period is not robust; for instance, it is lost if the start of the sample is moved forward only one or two quarters.

TABLE 4
Correlation coefficients for KANDI

KANDI on:	BAND (90Q1-94Q3)				FLOAT (96Q1-01Q2)			
	t	t–1	t–2	t–3	t	t–1	t–2	t–3
CONS	–	0.4790 **	0.4361 *	–	0.3899 *	0.5132 **	0.3695 *	–
INVEST	–	–	0.3898 *	0.5703 ***[a]	0.5004 **	–	–	–
NIR	–0.4298 *	–0.5013 **	–0.4317 ***	–0.4263 *	–	–	–	–
INF	–	–0.4732 **	–0.7464 ***	–0.7496 ***	–0.6098 ***	–	–	–
RIR	–	–	0.4763 **	0.4845 **	0.5292 **	–	–	–
NER	–	–0.4072 *	–0.7394 ***	–0.7370 ***	–0.3699 **	–	–	–
RER	–0.4895 **	–0.5584 **	–0.7077 ***	–0.7430 ***	–0.4790 **	–	–	–
RER2	–	–0.4064 *	–0.7025 ***	–0.6501 ***	–0.5034 **	–	–	–
MB	–	–	0.5102 **	0.3914 **	–	–	–	–
M1	0.4293 *	0.4266 *	0.6765 ***	0.6691 ***	0.4950 **	–	–	–
SPI	–	–	0.5477 **	0.4703 **	0.3377[b]	–	–	–
FXRV[1]	0.4332 *	–	–	–	0.6899 ***	–	–	–
CA	–	–	–0.5501 **	–0.6448 ***	–0.5195 **	–0.4688 **	–	–
GOVD	–	–	–	–	–	0.4295 **	–	–

*** (**) [*] = significant at 1% (5%) [10%].
a/ p-value is 0.0108.
b/ p-value is 0.1242.
Sample period is defined by observations for the variables in the first column.
1/ Without trend or quarter effects removed.
Definition of variables in table 1.

The second stage involves the estimation of a series of regression equations, each one including as an additional regressor a variable that presumably can act as a transmission channel from capital flows to consumption or investment. The idea is that, if the variable is indeed a significant channel, this should be reflected in a change in the size and statistical significance of the capital flow coefficient (see: Greene, 2002, for a recent application of this approach). The underlying assumption is that the effect of non-FDI flows on consumption or investment is not direct, but operates through third variables.

To deal with the possible endogeneity of regressors, 2SLS estimation is carried out when current values of the right-hand-side variables are used (otherwise, OLS is used). Lags (usually two) of the regressor(s) were included as instruments. Each regression equation is accompanied by tests for serial correlation, ARCH errors, Ramsey's specification error, and normally distributed residuals. In most cases, diagnostic results are fine; any failure is noted in the text.

The Effects of Capital Flows

Initial exploration confirmed two characteristics of the relationship between consumption and investment on one side, and non-FDI flows on the other (see: tables 5 and 6). The first is that there is no significant effect of capital flows on domestic demand on a contemporaneous basis, but only when lags are allowed for. It turns out that the best fit is obtained using different lag structures for the two reference periods. In the case of consumption, the most significant results are obtained when KANDI is lagged one quarter in the band period, but two quarters in the floating period (see: equations 1 and 2, table 5). In the investment equation, KANDI is lagged three quarters in the band period, while all the first three lags are used for the floating period (see: equations 1 and 2, table 6).

A second characteristic of the relationship is that it intensifies as we move from the band to the floating period. Using the estimated coefficients for the interactions of KANDI with the float dummy, it can be calculated

that eventually (*i.e.*, taking into account all significant lags) the capital flow coefficient increased by more than 170% after the shift to float (from 2.50 to 6.96) in the consumption equation, and by nearly 40% (from 2.72 to 3.76) in the investment equation (see: equation 2 in tables 5 and 6). These results support the idea that the increased variability of demand observed in the recent period was partly driven by the fluctuations in foreign investment.[13, 14]

To better interpret the size of the coefficients, we may consider the following: during the band period, the average level of consumption was 874.7 billions of pesos (at 1993 prices); thus, a one standard deviation in KANDI (2.787 billions of dollars) tended to produce a variation of 0.8% in consumption. Using the data in table 2, it can be calculated that a similar KANDI shock tended to cause a variation twice as large in aggregate consumption during the floating period.

There is, however, the possibility that the observed increase in the size of the KANDI coefficients is being driven by observations corresponding to the crisis period. The equations estimated so far have included a crisis *intercept* dummy; in a crisis context, though, domestic spending may be atypically sensitive to variations in capital flows (for instance, because of their impact on private expectations, or because firms and households are in a fragile situation in the aftermath of a strong currency depreciation). This would lead to *slope* shifts in the regression equations. To explore this possibility, a new variable, defined as the product of KANDI and the crisis

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13 There is some previous evidence pointing in this direction. Iwata and Tanner (2003) analyze the macroeconomic effects of capital account shocks (within a VAR model) in Mexico, among other countries. During 1988-1994, the adjustment to such shocks involved mainly variations in international reserves; during the floating period, in contrast, it has taken place through a combination of changes in reserves, the interest rate and the exchange rate. They conclude that while in the former period capital account shocks had no statistically significant effect on output growth, such an effect can in fact be detected in the latter period.

14 It is worth noting that although this first econometric specification is very limited, purposefully leaving aside a number of potentially significant macroeconomic determinants of aggregate demand (in order to gain later on some insight into the transmission channels), it does however amply pass all diagnostic tests.

dummy, was included, with corresponding lags, in the original equations (see: equations 3 and 4 in tables 5 and 6).

It can be seen that the interaction of KANDI with the crisis dummy is statistically significant (at various lags) in both the consumption and investment equations. But the implications are different in each case. For consumption, the introduction of the new variable does not invalidate the previous conclusion of a rise in the KANDI coefficient in the floating period. In fact, the sum of coefficients for the interactions of current KANDI and KANDI(–2) with the crisis dummy is not significantly different from zero (see the result of the Wald test).

For investment, though, the initial conclusions do change. In particular, after a shift in the KANDI slopes is allowed for during the crisis quarters, only the third lag of KANDI remains statistically significant; the result is that the KANDI coefficient changes from positive to zero in the floating period.

The effect of capital flows on investment demand was initially significant, in economic terms: it can be easily calculated (from equation 2 in table 6 and the data in table 2) that a one standard deviation in KANDI during the band period tended to produce a 3.4% change in investment. This is, as can be recalled, larger than the corresponding effect on consumption. After the adoption of floating, this effect was at first larger; however, once the crisis period was left behind, the connection between investment and capital flows essentially disappeared.

In the remainder of this section, we will use the original specification, without the KANDI*CRISIS interactions, as benchmark, to allow for a richer analysis of the transmission channels for capital flows.[15] This corresponds to equation [2] in both the consumption and investment tables. But then it must be kept in mind that conclusions about the transmission to investment during the float are, in fact, valid mainly for the initial part of that period.

[15] Note also that the results from Ramsey's specification test do not support the inclusion of the KANDI*CRISIS interactions in the investment equation.

TABLE **5**

Consumption Analysis

(Dependent: CONS; sample period: 1990Q1-2002Q2; 50 observations)

(Equation) method	*[1] OLS*	*[2] OLS*	*[3] OLS*	*[4] OLS*	*[5] 2SLS*	*[6)] 2SLS*	*[7] 2SLS*	*[8] OLS*	*[9] 2SLS*	*[10] 2SLS*
INTERCEPT	4.8303 *	4.3469 *	3.8394	3.6869 *	–0.3831	0.8348	2.9252	4.2999 *	6.0557 **	2.1452
BNX	–44.9770 **	–44.0528 **	–38.5872 **	–39.0450 **	–29.8626	–35.3649 **	–30.6613 *	–41.5741 **	–44.9729 ***	–24.5087
CRISIS	–10.515	–9.9814	–5.5861		26.0936 *	13.2968	–5.2799	–11.6941	–22.1677 **	–1.3595
CONS(-1)	0.6600 ***	0.6466 ***	0.5896 ***	0.5915 ***	0.3974 ***	0.5530 ***	0.4984 ***	0.6015 ***	0.3630 ***	0.4370 ***
KANDI(-1)	2.3215[a]	2.5052 ***	2.3758[b]	2.7280 ***	0.0312	1.5583 *	1.2215	2.5828 ***	2.4178 ***	1.8734 **
KANDI(-2)	–0.7538		0.6956							
KANDI(-1)*FLOAT	0.3262		–0.1184							
KANDI(-2)*FLOAT	5.2173 ***	4.4606 ***	2.8371[c]	3.6236 ***	3.9679 ***	3.5286 ***	3.2793 ***	4.8928 ***	4.7698 ***	2.6741 **
KANDI*CRISIS			–5.8703 **	–5.2035 **						
KANDI(-1)*CRISIS			1.4078							
KANDI(-2)*CRISIS			5.1445 *	5.9278 ***						
RER					–17.571 ***					
NIR						–1.5383 **				
SPI							0.2662 ***			
GOVD(-1)								–17.0346 *		
MB									229.1468 **	
GDP										0.3354 **
Adj R-sq	0.7202	0.7311	0.7561	0.7708	0.6494	0.7510	0.7351	0.7448	0.7628	0.8205
BG 4	0.8986	0.8878	0.3904	0.3925	0.5228	0.9442	0.4939	0.8893	0.8296	0.7205
ARCH	0.2092	0.2138	0.5692	0.3470	0.5454	0.7374	0.2026	0.3282	0.4321	0.2218
RESET	0.4848	0.3671	0.8233	0.7085	0.6155	0.9768	0.9210	0.1521	0.7420	0.7341
JB	0.9920	0.9999	0.6718	0.9530	0.9644	0.4110	0.1751	0.9987	0.4154	0.7031
Wald				0.7287						

*** (**) [*]: significant at 1% (5%) [10%] level.

a/ p-value is 0.1621; b/ p-value is 0.1290; c/ p-value is 0.1555.

BG 4 is the Breusch-Godrey LM test for the absence of up to 4th-order serial correlation. ARCH is Engle's LM test for the absence of 1st-order ARCH errors. RESET is an F-test for the absence of Ramsey's specification error. JB is the Jarque-Bera test for normally distributed errors. The null in the Wald test is that the sum of coefficients of KANDI*CRISIS and KANDI(–2)*CRISIS is zero. In all cases the p-value for the test is reported.

TABLE **6**

Investment Analysis

(Dependent: INVEST; sample period: 1990Q1-2002Q2; 50 observations)

(Equation) method	*[1] OLS*	*[2] OLS*	*[3] OLS*	*[4] OLS*	*[5] 2SLS*	*[6] 2SLS*	*[7] 2SLS*	*[8] OLS*	*[9] 2SLS*
INTERCEPT	2.9940 *	2.6891 *	2.1961	1.8980	1.7220	0.6472	3.1692 **	2.8067 **	1.0934
BNX	–18.4461 *	–18.4043 *	–12.5564	–12.5795	–18.9594 *	–9.3574	–13.1986 **	–19.6483 ***	–12.9674 ***
CRISIS	–19.0764 ***	–17.8232 ***	–3.1407	–2.2176	6.3007	–12.9864	–17.0700 *	–18.1910 **	–6.3503
INVEST(-1)	0.6375 ***	0.6294 ***	0.8065 ***	0.7937 ***	0.4584 ***	0.7778 ***	0.5152 ***	0.5853 ***	0.1972
KANDI(-1)	–0.3651		–0.6551						
KANDI(-2)	–0.6676		–0.4195						
KANDI(-3)	3.0415 ***	2.7154 ***	2.3333 **	2.0530 **	–1.6003	2.8453 ***	0.5832	2.6688 ***	1.4103 *
KANDI(-1)*FLOAT	2.0079 *	1.6845 ***	0.9491	0.3486	0.7851	1.1850 **[c]	1.3521 **	1.7816 ***	0.6644
KANDI(-2)*FLOAT	2.2347 **[a]	1.6308 **	0.9116	0.5629	1.8286 **	1.0044[d]	1.4779 **	1.9702 ***	–0.2961
KANDI(-3)*FLOAT	–2.6576 **	–2.2650 **[b]	–2.9437 **	–2.5844 **	2.1911	–2.5033 **	0.4061	–2.2836 **	–1.4313 *
KANDI(-1)*CRISIS			5.4524 ***	5.3827 ***					
KANDI(-2)*CRISIS			2.6487 *	2.6423 *					
RER					–10.4784 *				
RIR						–0.7686 **			
SPI							0.1332 **		
GOVD(-1)								–11.8540 **	
GDP									0.4333 ***
Adj R-sq	0.8366	0.841	0.8680	0.8707	0.8221	0.8451	0.8586	0.8556	0.9378
BG 4	0.9321	0.965	0.2639	0.2155	0.7576	0.6142	0.8315	0.8882	0.8377
ARCH	0.3982	0.5076	0.8689	0.6400	0.577	0.2926	0.2739	0.5983	0.6161
RESET	0.7517	0.4927	0.1169	0.0873	0.513	0.9906	0.3663	0.4821	0.4798
JB	0.7129	0.874	0.8963	0.8499	0.1725	0.9947	0.8332	0.1795	0.0596
Wald				0.8128					

*** (**) [*]: significant at 1% (5%) [10%] level.

a/ p-value is 0.0531; b/ p-value is 0.0514; c/ p-value is 0.0560; d/ p-value is 0.1584.

2SLS estimation uses two lags of the current-value regressor as additional instruments, except equation [9] which uses three lags of GDP.

For test descriptions, see table 5. The null in the Wald test is that the sum of the KANDI coefficients (except the interactions with CRISIS) is zero.

Transmission Channels

As mentioned before, non-fdi flows are expected to affect aggregate demand levels, not directly, but through third variables. In particular, a rise in capital inflows, implying a greater world demand for local assets, is likely to bring about an increase in asset prices (*i.e.*, an appreciation of the currency, lower domestic interest rates, and higher share prices), an expansion of monetary aggregates, and probably a looser stance in fiscal policy. These changes, in turn, are likely to affect domestic consumption and investment demand.[16]

The variables considered in the following analysis are: the real exchange rate (RER or RER2),[17] the real and nominal interest rates (RIR and NIR, respectively), the output-adjusted real money base (MB) and money supply (M1), the stock market price index, in real terms (SPI), and the federal government's budget deficit (GOVD) (again, the definition of these variables can be consulted in table 1).

Exchange Rate

A rise in capital inflows that appreciates the currency in nominal terms will also result, under some price rigidity, in an appreciation of the real exchange rate. A real currency appreciation can have a positive effect on consumption and investment demand through several channels: for example, by an increase in the purchasing power of workers, a reduction in the cost of imported capital goods,[18] or a fall in the domestic value of debts denominated in foreign currency (see: Ito and Krueger, 2001).

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[16] See Gavin *et al.* (1996); Ocampo (2000); and Montiel and Reinhart (2001), for a discussion of transmission channels, and Jansen (2003) for an empirical examination.

[17] RER is the ratio between US and Mexican overall consumer prices, while RER2 corresponds to the price ratio between tradable (manufacturing) and non-tradable (construction) goods in Mexico.

[18] See: Agosin (1998) for a formal model and an application to Chile, and Ocampo and Tovar (1998) for the Colombian case.

Table 4 shows that indeed there has been a negative correlation between the (nominal and real) exchange rate and non-FDI flows in Mexico since 1990. A somewhat unexpected finding is that the correlation of capital flows with the exchange rate has fallen during the floating period, a result that could be explained by the use of international reserves as a sort of macroeconomic bumper against short-run fluctuations in capital flows (see: Griffith-Jones *et al.*, 2001, for a general discussion of this point). This possibility is supported by the observation of a fall in the intensity of the correlation between capital flows and the current account deficit under the float (from 0.64 to 0.52), and by a rise in the correlation between capital flows and foreign exchange reserves (from 0.43 to 0.69; see: table 4).

As expected, the real exchange rate in our consumption and investment equations presents a statistically significant, negatively signed coefficient (see: equation 5, tables 5 and 6).[19] From the estimated coefficients and the data in table 2, it can be calculated that a change of one standard deviation in the real exchange rate during the band period tended to reduce consumption in 2.4%. The negative effect on investment is much stronger, at 5.6 percent.

The inclusion of RER as a regressor produces a decline in the size of the KANDI coefficient in both equations. There is some differentiation between periods. The KANDI coefficient stops being statistically different from zero during the band period, but the shift coefficient for the floating period remains significant. The interpretation is that the real exchange rate has been a key transmission channel for capital flows during the entire sample, but was particularly important in its early part; in fact, no significant effect of capital flows on either consumption or investment demand can be detected, once the influence of the real exchange rate is controlled for, during the band period. The coefficient for the floating period falls in more than 40% in both the consumption and investment equations, but remains statistically significant.

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[19] Qualitatively similar results obtain if RER2 is used instead of RER, although RER2 is not statistically significant in the investment equation.

Interest Rate

An exogenous rise in the world demand for local bonds is likely to produce a decline in local interest rates, although this may be conditioned by the type of exchange regime. Table 4 shows that (current and lagged) KANDI and NIR were negatively correlated in the early 1990s, but that the association has vanished during the floating period. In a sense, this is an expected result: as is well known, monetary autonomy under conditions of international mobility of capital is enhanced by a shift to a more flexible exchange rate regime. To the extent that aggregate demand depends (inversely) on the interest rate, the negative correlation between KANDI and NIR during the band period can be a channel for the transmission of capital flows. This will be the case in particular if changes in the nominal interest rate are transmitted to the real interest rate (RIR).

However, an unexpected result is that the association between non-FDI flows and the real interest rate has been highly significant and remained basically unchanged across periods (instead of becoming weaker after the shift to float). Moreover, the correlation coefficient is positive. This, of course, is explained by a persistent, negatively signed, significant correlation between non-FDI flows and inflation.[20] The positive correlation between non-FDI flows and the real interest rate means that, regardless of the specific exchange rate regime in operation, the real interest rate will behave in counter-cyclical fashion in relation to capital flows, tempering their effect on economic activity.

The inclusion of the real interest rate in the investment equation yields the expected results, in the sense that the RIR coefficient is statistically

[20] The causality between inflation and capital flows can run both ways; it seems unlikely, though, that capital flows would respond to merely short-term variations in the inflation rate (recall that variables in table 4 have been de-trended). Lower inflation may signal macroeconomic stability and thus attract capital flows, but larger capital flows may increase the inflation rate by its effect on the money supply and generally on domestic aggregate demand. However, they can have a disinflationary effect by increasing the real wage (through a real currency appreciation), and moderating the demands for a rise in nominal wages; see Ibarra (2003) for an empirical examination.

significant and negatively signed (see equation 6 in table 6). It can be seen that the new specification has very little effect on the KANDI coefficient: for the band period, it in fact increases slightly –as should be, given the positive correlation between RIR and KANDI–, from 2.7 to 2.8 (compare equations 2 and 6 in table 6), while its size and significance during the floating period are somewhat reduced.

Initial results for the consumption equation were surprising because the real interest rate was not statistically significant. If the nominal interest rate is instead used, then the expected negative coefficient is obtained (see equation 6 in table 5). The inclusion of NIR results in a reduction in the size of the KANDI coefficients, of about one third, across periods (compare equations 2 and 6); this is consistent with the observed negative correlation between KANDI and NIR. In contrast to the equation with the real exchange rate, though, the coefficients remain statistically significant.

Overall, the evidence supports the conclusion that the interest rate has had a relatively minor role in the transmission of capital flow fluctuations to aggregate demand, particularly so in the case of investment demand.

Stock Market Prices

Share prices are expected to be an important determinant of domestic expenditure. Higher prices increase household wealth and thus may raise private consumption. And, naturally, they represent an incentive for corporate investment. To the extent that they respond to variations in capital flows, share prices can therefore perform the role of transmission channel. Table 4 shows that, in effect, there is a positive correlation between KANDI and the stock market price index (SPI). During the band period, the link was strong and highly significant; after the shift to float, however, there is a reduction in its size and statistical significance. The implication is that the role of SPI as transmission channel may have lost intensity during the floating period.

The introduction of SPI as an additional regressor in the consumption and investment equations yields results that are basically in accordance with what could be expected (see: equation 7 in tables 5 and 6). Firstly, SPI is a highly significant (in a statistical sense) determinant of consumption and investment. The effect is also meaningful in economic terms: it can be calculated that, during the band period, a one standard deviation in SPI tended to increase consumption in 3.7% and investment in 7.3%. Note again that the effect is stronger on investment than on consumption, as was the case with the real exchange rate.

Secondly, share prices have been an important transmission channel for capital flows. Again, the evidence here follows the pattern detected before for the real exchange rate, in the sense that such role appears to have been stronger in the band than in the floating period. In particular, during the band period the KANDI coefficient becomes insignificantly different from zero for both consumption and investment; during the floating period, in contrast, the coefficient falls to about a half in the consumption equation, but does not change much in the investment equation (compare equations 2 and 7 in tables 5 and 6). This result, which is consistent with the observed fall in the correlation coefficient between KANDI and SPI, implies that share prices had ceased to be a significant channel from capital flows to investment already in the initial stage of the floating regime.

Other Transmission Channels

It has often been argued that fiscal policy in developing countries tends to be pro-cyclical: the budget deficit expands with capital inflows and economic activity, taking advantage of relatively abundant sources of funds, and goes down in tandem with capital flows to minimize the impact on the government's credibility among investors (see: Eatwell and Taylor, 2002). Table 4 shows that the fiscal deficit in Mexico (GOVD) has been positively correlated with (lagged) capital flows in the recent period.

The coefficient on the (lagged) fiscal deficit is statistically significant, but negatively signed, in both the consumption and investment equations

(see: equation 8 in tables 5 and 6).[21, 22] This implies the deficit has a contractionary effect on these two components of aggregate demand. In consequence, if a rise in capital flows is followed by a greater fiscal deficit, this will actually tend to curb the capital flows' positive effect on demand.[23] More important for our present purposes, though, is the fact that the inclusion of GOVD as an additional regressor does not have an important influence on either the size or the statistical significance of the KANDI coefficients (even during the floating period, contrary to our initial expectation). This evidence is consistent with the idea that fiscal policy is too slow to react to quarterly variations in capital flows, in order to make any substantial difference for the latter's macroeconomic impact.

Generally speaking, capital flows can be expected to affect domestic monetary aggregates, as mentioned at the beginning of this sub-section, although the effect may depend on the choice of exchange rate regime. In the present case, table 4 shows that both the money base and M1 have been positively correlated with non-FDI flows throughout our two reference periods.[24, 25] Again, this provides the basis for a possible role of monetary aggregates as transmission channels.

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21 Note the result for the test of normal residuals is not entirely satisfactory in the investment equation.

22 In a related result, Gupta *et al.* (2001) found that output growth in a large sample of countries tended to be stronger in the two years following a currency crisis, if the adjustment program included a tightening of fiscal policy.

23 It is beyond the scope of this paper to investigate the possible reasons for the observed contractionary effect of the budget deficit on private demand. We may note, however, that if both the nominal interest rate (lagged or contemporaneous) and the lagged government deficit are included in the consumption equation, then the deficit coefficient (but not the interest rate's) becomes statistically insignificant. In contrast, if the interest rate is included twice lagged (*i.e.*, predetermined in relation to the fiscal deficit), then both variables remain significant. These results indicate that the contractionary effect of the budget deficit may be linked to its effect on domestic interest rates. Note, however, that a similar effect cannot be found in the investment equation including the real interest rate and the budget deficit.

24 The correlation with M1 fell after the adoption of the floating regime, possibly as a reflection of the greater monetary autonomy associated to the regime switch. In contrast, the correlation with the money base has remained largely unchanged.

25 Unexpectedly, it was not possible to find a significant link with a broader aggregate, such as M2.

The inclusion of the money base in the consumption equation yields mixed results (see: equation 9 in table 5). As expected, the new variable presents a statistically significant, positively signed coefficient. However, its inclusion has no noticeable impact on the KANDI coefficients, in either economic or statistical terms. In other words, the money supply does not seem to have performed a role as transmission channel for capital flows in any of the periods.[26]

Finally, GDP is included as a regressor in the initial consumption and investment equations, as a summary of all possible influences from capital flows as they are captured in overall economic activity levels (see: equation 10 in table 5 and equation 9 in table 6). As expected, the inclusion of GDP induces a fall in the size of the KANDI coefficients. In the case of consumption, the reduction is of about 24% for the band period and 34% under the float; despite this fall, the coefficient remains statistically significant in both periods. In the case of investment, the reduction is larger during the band (about a half), while the coefficient stops being statistically significant in the floating period.

Conclusions

After the economic crisis of 1994-1995 and the adoption of a floating exchange rate regime, foreign capital flows to Mexico, other than FDI, have been relatively small (on a cumulative basis) but very volatile. In fact, on a given quarter they can be as large as FDI. In consequence, although they have not been a significant source of permanent external resources for the country, non-FDI flows are a potential factor of macroeconomic instability. This raises the issue of their possible transmission to the real side of the economy, and thus represents a clear test for the operation of the floating system. Is there any evidence of insulation brought about by the new regime?

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[26] Similar results obtain with the inclusion of M1 (twice lagged). None of the monetary aggregates was a significant regressor in the investment equation.

The volatility of aggregate consumption and investment has risen together with that of capital flows. In parallel, the effect of (lagged) changes in non-FDI flows on consumption has intensified during the floating period. This supports the idea that the volatility of capital flows is a significant factor behind the observed behavior of consumption. In contrast, the effect of capital flows on domestic investment has tended to disappear.

By their nature, non-FDI flows do not affect aggregate demand directly but rather through the intermediation of domestic financial markets. This may lead to the emergence of different types of channels for the transmission of capital flows to domestic demand. In the case of Mexico, some of the expected channels, such as the real exchange rate and stock prices, have been important; others, like the interest rate, the budget deficit and different monetary aggregates, have not.

The real exchange rate and stock prices have been very significant (in economic terms) determinants of consumption and investment demand. The correlation of those two variables with non-FDI flows declined after the peso was allowed to float; this implies that their role as transmission channels has become weaker. Together, these two observations help to explain the observed tendency of domestic investment to become detached from short-run fluctuations in capital flows.

Although this offers a plausible interpretation for the behavior of investment, it's worth keeping in mind that the weak correlation of these two variables with foreign capital flows in the recent period is not likely to be explained by the introduction of the floating regime itself. This is particularly clear in the case of the real exchange rate, which probably has been less correlated with capital flows, not because of the flexibility of the nominal rate, but rather due to the high contemporaneous correlation between capital flows and the variation in the stock of international reserves at the central bank; in other words, despite the flexibility of the exchange rate, the stock of international reserves has performed as a sort of macroeconomic bumper. In fact, given the strong effect of the real

exchange rate on domestic demand, the floatation itself probably tends to increase aggregate demand volatility.[27]

In the case of stock prices, the recently observed disconnection with lagged changes in capital flows may have to do with the much smaller size of foreign investment in the stock market after the adoption of floating. During the period characterized by a semi-fixed exchange rate system, foreign investment in the stock market had a quarterly mean value of 1.489 billions of dollars, with a maximum value of 6.257 billions and a standard deviation of 1.452 billions. In contrast, during the floating period (not considering 1995) the average level of investment was only 0.423 billions, with a maximum of 2.238 and standard deviation of 0.823.

There is the further question of why only investment, but not consumption, has become increasingly detached from foreign capital flows. Part of the answer may be that investment is much more sensitive than consumption to variations in the real exchange rate and stock prices, thus receiving a larger benefit from the weaker response of these two variables to capital flow fluctuations in the recent period. But clearly this cannot explain why consumption has become *more* sensitive to variations in capital flows.[28] This is a question that is left open for future research.

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[27] This is a topic of current debate. Gosh *et al.* (2003), Ffrench-Davis and Larraín (2002), and Levy-Yeyati and Sturzenegger (2001) present cross country evidence that the volatility of output (levels or growth rates) tends to be relatively high among countries with a system of fixed exchange rate. Other studies, such as Baxter and Stockman (1989), and Flood and Rose (1995) have failed to uncover a robust connection between exchange regime and macroeconomic performance. See: Duarte (2003) for a discussion.

[28] Even after controlling for the effect of GDP on consumption.

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