

Financial liability adjustment of firms with FDI: the Mexican case before and after the 1994 crisis*

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Abstract

The literature on the volatility of capital flows generally finds that flows of foreign direct investment tend to be more stable than other types of capital flows. However, it has been argued that official FDI statistics might not give a complete picture of the flows associated with firms that have FDI. As firms with higher FDI tend to have more foreign liabilities, liability adjustments by these firms may imply larger capital outflows without this being reflected in the FDI statistics. This paper finds that the opposite occurs, so an additional advantage of FDI is that firms with significant FDI have less incentives to change their liability structure in response to a higher probability of an exchange rate crisis. A model of financial decisions of firms shows that the optimal portfolio adjustment of firms with higher FDI is smaller than that of firms with less FDI, as the foreign owners of firms with considerable FDI have more diversified portfolios.

The model is tested for Mexico in the period 1990-1995 using a database of financial balances of firms. At any moment in time, it is found that with firms that produce tradable goods and have more FDI have a larger relative proportion of foreign liabilities. In addition, it is found that, previous to the 1994 crisis, firms with larger FDI increased their dollar liabilities relative to firms with smaller amounts of FDI.

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I. Introduction

It is generally considered that foreign direct investment (FDI) is desirable for a country. Technological transfers, more resources available for financing of investment, and greater stability of FDI flows compared to portfolio flows are some of the benefits associated with this type of capital flows². The last issue of higher stability is a particularly relevant question for Mexico and other developing countries, as the importance of FDI flows has increased in the last few years. In the case of Mexico, these have financed more than 60 percent of the current account deficit in every year since 1994.

Nevertheless, it has been argued that official FDI statistics may not give a complete picture of the financial transactions of firms with FDI. To the extent that these have more foreign liabilities than domestic firms, adjustments in the liability structure by firms with FDI can represent larger resource outflows.

A model of portfolio choice by the firm's owner was developed to analyze a firm's financial composition and how this changes. The model is based on the portfolio decisions of the owner, where she is to choose between investing (or borrowing) on national currency, foreign currency, and in a fixed asset which is costly to adjust. It is found that firms with more FDI have fewer incentives to modify their liabilities in response to an increase in the probability of devaluation, since they are less exposed to variations in the exchange rate. Likewise, it is found that the existence of a fixed asset, like the fixed investments of a firm, leads all firms to over adjust their liabilities in domestic and foreign currency in response to interest rate and expected exchange rate changes, in order to compensate for the slower adjustment of the fixed asset.

The model was tested for the Mexican case during the 1990-1995 period, finding that firms with greater FDI have more access to foreign resources, and that they actually increased their foreign liabilities during 1994. This implies that an additional advantage of enterprises with FDI is that they have fewer incentives to change their liabilities' structure in response to an increase in the probability of an exchange rate crisis in such a way that puts pressures on the foreign accounts.

A revision of the literature concerning stability of FDI flows is presented in the next section, as well as the growing importance of FDI in terms of the magnitude of these flows and the proportion of the current account it represents in the Mexican case. This illustrates the relevance of verifying if the flows associated with FDI have really been more stable than other types of flows.

A theoretical model about the firm's financial composition decisions and determinants is shown in the third section. The fourth section presents an empirical analysis regarding the evolution of FDI in Mexico, the firms' liability structure, as well as econometric tests of the model. It is found that firms with higher FDI have a greater proportion of liabilities in foreign currency, but adjust them by a smaller proportion than firms with less FDI.

II. Literature on the relative stability of FDI and the recent evolution of Mexican capital flows

² Caves (1996) presents an extensive revision of the determinants and implications of FDI at the firm level. In Feldstein (1999, chap.6) a recent discussion about the role of FDI in capital international flows is presented.

II.1. Revision of the literature

Regardless of other FDI benefits, such as technology transfers and organizational techniques, it has been argued that it has two advantages in the aspect of investment financing. First, the money that enters as FDI, unlike portfolio flows, buys goods and services in contrast to portfolio flows which are used to acquire financial assets. Flows that come in as FDI are more stable since, given the greater difficulty to sell fixed assets, it is more difficult to observe a reversion in comparison with portfolio flows. The second benefit resides on the fact that it is easier for firms with FDI to obtain foreign financing given that the information about the foreign owner as well as his reputation make it easier to get foreign resources on better terms. Also, foreign goods can be used as collateral for such credits.³

Turner (1991), Fry (1993) and Lipsey (1999) have carried out time series analysis regarding the stability of FDI. In particular, the FDI flows' variance is evaluated relative to the variance of other types of flows. Also, the possibility of abrupt reversions is identified studying the correlation coefficients and the predictability of the FDI series. It is found that FDI flows are more stable, as measured by a smaller coefficient of variation, a higher correlation coefficient between the value of FDI flows and its lagged values, and a greater ability to predict the value of the FDI flows.⁴

Nevertheless, it has been argued that flows associated to FDI may not be as stable once all the firm's flows are considered (Krugman 1994). To carefully understand the problem, it is useful to see an example. A foreign investor acquires fixed assets in Mexico using his own capital and foreign liabilities. The latter appear as debts in the capital account, and his own capital appears as FDI. As the probability of currency devaluation increases, the investor could ask for credit on national currency to reduce his liabilities on foreign currency, using his fixed assets as collateral. This represents an outflow of capital that does not appear in the FDI statistics but that would not have come about with a domestic firm originally leveraged in domestic currency.⁵ In a slight variation of the example, the firm with FDI would go short in domestic currency, buy foreign currency (which appears as a capital account outflow) and make a profit the moment the currency revaluates. This would appear as an increase in FDI even though it implied a resource outflow. The present study attempts to evaluate the occurrence of such events prior to the 1994 peso devaluation.

II.2. Capital flows into Mexico. Relative stability of different types of flows

³Dooley (1996) has an extensive revision of the recent literature on capital flows.

⁴ Claessens, Dooley and Warner (1995) have made a similar study in which they argue that there is not a significant difference between FDI and portfolio flows. Nevertheless, this is due to the fact that, instead of using half-yearly or annual data, they use quarterly data. Their results present FDI flows as unstable in short periods of time. Fixed investment probably require a larger amount of resources in a given period, yet this does not imply that flows are substantially unstable from a larger time perspective.

⁵ For a detailed exposition of the methodology used to measure FDI see Banco de México (undated).

These considerations about the stability of flows associated with FDI are particularly important for Mexico and other developing countries, as FDI has become one of the most important components of the capital account in terms of their magnitude and the proportion they represent of total flows to these countries.

The period 1989-1999 saw considerable capital flows, in both gross and net terms, between Mexico and the rest of the world. Table 2.1 presents the annual level of the current account, the capital account and the change in gross international reserves. Capital flows increase during the period 1989-1993, but diminish to levels similar to those of the beginning of the period during 1994-1996. They recover slightly to an intermediate level in 1997-1999.

The largest part of the flows during the period are flows between private sector individuals and institutions. Table 2.2 shows that the flows to the private sector represent more than 55% of the capital account in all the years of this period, with an average proportion of 121.5%. The structure of the flows to the private sector has changed as portfolio investment increased by a large amount during 1989-1993, while FDI increased by a smaller amount. This proportion is reversed in 1994-1995, as there was considerable FDI while portfolio flows were considerably reduced (see table 2.3 for the magnitudes of the flows). During 1996-1999, portfolio flows stabilize at an intermediate level, while FDI flows remain at a high level.

Table 2.1. Current account, capital account and change in gross international reserves. Billion dollars.

	Current account	Capital account	Errors	Change Gross reserve
1989	-5.82	3.18	3.04	0.27
1990	-7.45	8.30	2.52	3.55
1991	-14.65	24.51	-2.17	7.38
1992	-24.44	26.42	-0.96	1.01
1993	-23.40	32.48	-3.14	5.98
1994	-29.66	14.58	-3.31	-18.39
1995	-1.58	15.41	-4.24	9.59
1996	-2.33	4.07	0.03	1.77
1997	-7.45	15.76	2.20	10.49
1998	-15.73	17.46	0.40	2.14
1999	-14.01	14.14	0.46	0.59

Source: Banco de México

Table 2.2. Flows to the private sector as a proportion of the capital account.

	Loans & deps Com. Banks	Loans & dep. Private Sector	FDI	Stock Market	Assets D.C. Private Sector	Assets F.C. Private Sector	Total Private
1989	30.857	-36.427	99.987	15.534	0.00	0.220	110.171
1990	52.837	4.785	31.737	24.038	0.00	13.245	126.642
1991	23.470	9.715	19.429	25.837	0.00	5.468	83.919
1992	1.116	8.057	16.628	18.105	0.00	13.471	57.377
1993	10.246	8.719	13.511	32.992	1.210	18.241	84.919
1994	10.084	8.180	75.235	28.001	-1.940	16.072	135.632
1995	-32.339	20.441	61.837	3.370	-0.448	4.102	56.963
1996	-42.268	48.363	225.729	68.824	-1.008	19.684	319.323
1997	-12.551	17.142	81.392	20.398	0.601	18.372	125.354
1998	-0.818	34.390	64.764	-3.811	-0.436	-1.867	92.223
1999	-9.677	30.190	81.801	26.653	0.177	15.302	144.445

Source: Banco de México

Table 2.3. Flows to the private sector. Billion dollars.

	Loans & dep. Banks	Loans & dep. Private Sector	FDI	Stock Market	Assets D.C. Private Sector	Assets F.C. Private Sector	Total Private
1989	0.980	-1.157	3.176	0.493	0.000	0.007	3.499
1990	4.384	0.397	2.633	1.994	0.000	1.099	10.508
1991	5.752	2.381	4.761	6.332	0.000	1.340	20.566
1992	0.295	2.129	4.393	4.783	0.000	3.559	15.158
1993	3.328	2.832	4.389	10.717	0.393	5.925	27.584
1994	1.471	1.193	10.973	4.084	-0.283	2.344	19.781
1995	-4.982	3.149	9.526	0.519	-0.069	0.632	8.776
1996	-1.720	1.968	9.185	2.801	-0.041	0.801	12.994
1997	-1.978	2.702	12.830	3.215	0.095	2.896	19.759
1998	-0.143	6.006	11.311	-0.666	-0.076	-0.326	16.106
1999	-1.369	4.269	11.568	3.769	0.025	2.164	20.427

Source: Banco de México

As can be seen in table 2.4, the standard deviation of quarterly FDI flows is smaller than that of flows to the stock market, and is similar to that of flows associated with deposits and loans to commercial banks. It is larger than that of other flows, but this is due to the fact that FDI is larger than any other type of flow. Controlling for this, it is found that FDI has the smallest coefficient of variation, which indicates that, even though there is a high variation in FDI flows, this is proportionately smaller. At the level of annual flows, the coefficient of variation is smaller for all the different types, but the results are similar.

Table 2.4. Standard deviation (thousands) and standard deviation / mean of flows to the private sector. Period 1989-1999. Calculated on the basis of quarterly and annual flows. Source: Banco de Mexico.

	Quarterly (million dollars)			Annual (billion dollars)		
	Mean	St. Dev.	Coef of Var	Mean	St. Dev.	Coef of Var
Total Private	3980.86	2359.26	0.59	15.92	6.72	0.42
Loans & dep. Com. Banks	136.77	1069.48	7.82	0.55	3.11	5.69
Loans & dep. Private Sector	587.93	671.28	1.14	2.35	1.89	0.80
FDI	1926.01	1095.81	0.57	7.70	3.84	0.50
Stock Market	864.59	1200.94	1.39	3.46	3.17	0.92
Assets D.C. Private Sector	0.99	57.37	57.89	0.00	0.16	40.38
Assets F.C. Private Sector	464.57	797.46	1.72	1.86	1.80	0.97

The above results coincide with those from other studies. Eventhough there is considerable variation of FDI in absolute terms, they are the most stable in relative terms. However, these results might not incorporate other financial flows determined by firms with FDI that lead to larger fluctuations in the capital account but that are not identified by FDI statistics, so they are not a complete measure of the real flows inside a firm nor of the pressures that these can generate on the external accounts.

III. Model of portfolio choice with a fixed asset

III.1. Base Model

To analyze the determinants of a firm's financial composition, the firm will be taken as a collection of assets, whose levels are determined by an investor's (owner or manager) decision to optimize the return on her portfolio. The financial composition of a firm is defined as the composition of the firm's assets. The assets on which the investor has a long position are accounting assets, and those on which she has a short position are accounting liabilities.

The asset choice model assumes that the investor can buy or sell with no cost all the assets she desires, except for the asset that characterizes the firm. The possession of an asset that can only be adjusted by paying a cost differentiates a firm from a simple portfolio investor, i.e. the firm has a fixed asset which can be modified only by paying an additional cost that increases in a non-linear fashion as the quantity of the asset changes. I assume that the assets' returns are independent of any decision taken by the owner.

The owner's problem is the following:

$$\begin{aligned}
& \text{Max}_{\mathbf{a}_t} \Sigma_t \mathbf{r}^t E_t U(\mathbf{a}_t W_t r_t - c_t^f) \\
& \text{s.t.} \\
(1) \quad & c_t^f = \mathbf{g}(\mathbf{a}_t^f - \mathbf{a}_{t-1}^f)^2, \\
& \Sigma_i \mathbf{a}_t^i = 1 \\
& \text{where : } \mathbf{a}_t = (\mathbf{a}_t^1, \dots, \mathbf{a}_t^f, \dots, \mathbf{a}_t^n), \\
& r_t = (r_t^1, \dots, r_t^f, \dots, r_t^n)
\end{aligned}$$

where W_t is the investors wealth at moment t , r_t is a vector of the different assets' returns, \mathbf{a}_t is a vector of the proportions of wealth invested on each type of asset, \mathbf{r} is the discount factor, c_t^f gives us the cost of adjusting the proportion of the fixed asset, and \mathbf{g} is an adjustment cost factor.⁶

To solve this problem, I assume that the investor's utility function is exponential and that the assets' returns are log-normally distributed. It follows that the objective function can be restated as:

$$(2) \quad \text{Max}_{\mathbf{a}_t} \Sigma_t \mathbf{r}^t \left\{ \beta \bar{r}_t W_t - \frac{1}{2} \beta^2 W_t^2 \left\{ \Sigma_i \Sigma_j \mathbf{a}_t^i \mathbf{a}_t^j \text{Cov}(r_t^i, r_t^j) \right\} - \beta c_t^f \right\}$$

where β is the coefficient of relative risk aversion.

The general form of the solution for the fixed asset is:

$$(3) \quad \mathbf{a}_t^f = \mathbf{a}_{t-1}^{f*} + \mathbf{h}(\mathbf{a}_{t-1}^f - \mathbf{a}_t^{f*}), \quad \mathbf{h} = f(\mathbf{g}, \beta, \mathbf{r}, \bar{r}, \Sigma)$$

Once the level of the fixed asset is determined, the proportions of the other assets can be obtained using the first order conditions for a conventional asset choice problem. These are:

F.O.C.

$$(4) \quad \mathbf{a}_t^i, i \neq f: \bar{r}_t - \beta W_t \mathbf{a}_t^i \text{Var}(r_t^i) - \beta W_t \Sigma_{j \neq i} \mathbf{a}_t^j \text{Cov}(r_t^i, r_t^j) - \mathbf{I}_t = 0$$

$$(5) \quad \mathbf{I}_t: 1 - \Sigma_i \mathbf{a}_t^i = 0$$

⁶ The adjustment cost function could be stated in terms of the fixed asset amount adjusted, and not in terms of its proportion: $c_t^f = \gamma(q_t^f - q_{t-1}^f)^2 = \gamma \{ (\alpha_t^f W_t / p_t^f) - (\alpha_{t-1}^f W_{t-1} / p_{t-1}^f) \}^2$. If there are no changes on the investors' wealth or the fixed asset price level, the constraints are equivalent. Given that there is no information regarding any of these variables, I decided to work with the proportions' version. In both cases, the solution method is identical.

III.2. The two assets case

The two assets solution to the previous problem is the following:

$$(6) \quad \mathbf{a}_t^f = \mathbf{a}_t^{f*} + \mathbf{h}(\mathbf{a}_{t-1}^f - \mathbf{a}_t^{f*})$$

$$\text{where } \mathbf{h} = \frac{1 + 4\mathbf{e} - \sqrt{1 + 8\mathbf{e}}}{4\mathbf{e}}, \quad \mathbf{e} = \frac{\mathbf{g}}{\mathbf{b}W_t^2(\mathbf{s}_1^2 + \mathbf{s}_f^2 - 2\mathbf{s}_{1f})}$$

$$(7) \quad \mathbf{a}_{1t} = \mathbf{a}_{1t}^* - \mathbf{h}(\mathbf{a}_{t-1}^f - \mathbf{a}_t^{f*})$$

In this case, the proportion of the fixed asset adjusts gradually to its optimal value depending on the adjustment cost as a proportion of wealth, risk aversion, and both assets returns' variance and covariance. As wealth increases, the adjustment cost becomes less important. The more risk aversion, the greater is the cost of being far from the optimum, in utility terms. The higher the variance, it is also more costly to be far from the optimum, for a given risk aversion. Since there are only two assets, the excess of the fixed asset's proportion with respect to the optimum will be equal to the shortage in the other asset's proportion with respect to the optimum.

An increase in the return of one of the assets increases the optimal proportion of this asset in the portfolio, and decreases the proportion of the other asset. Increases in the variance of one of the assets causes the optimal proportion of that asset to tend to zero, while the proportion of the other asset tends to 1. An increase in the correlation between assets results in higher positions in absolute value of both assets. As was mentioned, the adjustment speed falls as the cost of adjusting the proportion of the fixed asset increases.

III.2. The three assets case

In the case of three assets, the solution for the proportion of the fixed asset has the same structure as in the previous case. It is equal to the optimal value plus a deviation that depends on the adjustment cost and on the difference between the fixed asset's last value and the optimal value. However, there is an important change in the portfolios' optimal value and in the \mathbf{e} term, on which the adjustment speed depends negatively. In this three assets case (assets f, 1 and 2), the solution has the following shape:

$$\mathbf{a}_t^f = \mathbf{a}_t^{f*} + \mathbf{h}(\mathbf{a}_{t-1}^f - \mathbf{a}_t^{f*})$$

$$\text{donde } \mathbf{h} = \frac{1 + 4\mathbf{e} - \sqrt{1 + 8\mathbf{e}}}{4\mathbf{e}},$$

$$\mathbf{e} = \frac{\mathbf{g}(\mathbf{s}_1^2 + \mathbf{s}_2^2 - 2\mathbf{s}_{12})}{\mathbf{b}W_t^2(\mathbf{s}_1^2\mathbf{s}_2^2 + \mathbf{s}_1^2\mathbf{s}_f^2 + \mathbf{s}_2^2\mathbf{s}_f^2 - 2(\mathbf{s}_1^2\mathbf{s}_{2f} + \mathbf{s}_2^2\mathbf{s}_{1f} + \mathbf{s}_f^2\mathbf{s}_{12}) - (\mathbf{s}_{12}^2 + \mathbf{s}_{1f}^2 + \mathbf{s}_{2f}^2) + 2(\mathbf{s}_{12}\mathbf{s}_{1f} + \mathbf{s}_{12}\mathbf{s}_{2f} + \mathbf{s}_{1f}\mathbf{s}_{2f}))}$$

$$(8) \quad \begin{aligned} \mathbf{a}_{1t} &= \mathbf{a}_{1t}^* + \mathbf{h}(\mathbf{a}_{t-1}^f - \mathbf{a}_t^{f*}) \left(\frac{\mathbf{s}_{2f} + \mathbf{s}_{12} - \mathbf{s}_{1f} - \mathbf{s}_2^2}{\mathbf{s}_1^2 + \mathbf{s}_2^2 - 2\mathbf{s}_{12}} \right) \\ \mathbf{a}_{2t} &= \mathbf{a}_{2t}^* + \mathbf{h}(\mathbf{a}_{t-1}^f - \mathbf{a}_t^{f*}) \left(\frac{\mathbf{s}_{1f} + \mathbf{s}_{12} - \mathbf{s}_{2f} - \mathbf{s}_1^2}{\mathbf{s}_1^2 + \mathbf{s}_2^2 - 2\mathbf{s}_{12}} \right) \end{aligned}$$

As in the two assets case, the proportions of the two free assets depend on the deviation of the fixed asset proportion with respect to its optimal value, but an important qualitative difference exists. In this case, the deviation will depend on the relation of each asset to the fixed asset's return, as well as on the relation between the free assets' returns. Let us suppose that asset 1 has a positive covariance with the fixed asset, while asset 2 has a negative covariance. In that case, and assuming that the fixed asset is the one with the highest expected return, the investor chooses a high and positive proportion of the fixed asset, will go short on the asset with positive covariance and less short, or slightly long, on the asset with negative covariance. Table 3.1 shows the adjustment in the optimal proportions of assets corresponding to changes in the different variance and covariance parameters.

Table 3.1. Change in optimal proportions of assets in response to changes in variance and covariance parameters. In the base case $\bar{r}_f > \bar{r}_1 = \bar{r}_2$, $\sigma_f^2 = \sigma_1^2 = \sigma_2^2$, $\sigma_{f1} > 0$, $\sigma_{f2} < 0$, $\sigma_{12} = 0$, so $\alpha^{f*} > \alpha_2^* > 0 > \alpha_1^*$.

Parameter that increases	Change in α^{f*}	Change in α_1^* $\sigma_{f1} > 0$	Change in α_2^* $\sigma_{f2} < 0$
σ_f^2	Falls (tends to zero)	Increases	Increases
σ_1^2	Falls	Increases (tends to zero)	Falls
σ_2^2	Increases	Increases	Falls (tends to zero)
σ_{f1}	Falls slightly initially, increases considerably for high values	Falls, considerably for high values	Increases
σ_{f2}	Falls slightly initially, increases considerably for high values	Increases slightly initially, falls considerably for high values	Falls, considerably for high values
σ_{12}	Prolonged reduction, increases for high values	Falls, considerably for high values	Increases, considerably for high values

To apply the model to the Mexican case, it was assumed that the free assets are liabilities denominated in domestic or foreign currency, and that the fixed asset is the fixed assets of the firm. In terms of portfolio composition, the return of the fixed asset and its covariances with other assets depend on the type of good the firm produces. In the case of firms that produce non-tradeable goods, the relation between the value and return of the fixed asset and the foreign currency liability will be negative. If the firm produces tradeable goods, the relation between the value and return on the fixed asset and the

foreign currency liability will be positive or less negative. Therefore, we should expect to observe that firms producing tradeable goods maintain a higher proportion of their assets in foreign currency than firms that produce non-tradeables.

As the expected returns change, a different portfolio adjustment is observed between firms that produce tradeable and nontradeable goods. An expected depreciation or devaluation of the exchange rate leads to an increase in the return of the foreign currency denominated liability, and an increase on the value of the fixed asset that produces tradeable goods. An increase in the foreign currency denominated credit return leads both types of firms to reduce their proportion of foreign currency liabilities, and to increase the proportion of national currency liabilities. A larger adjustment is made by the firms that produce non-tradeable goods, since the return of its fixed assets not only does not increase with a depreciation, but it can even fall. Subsequently, an increase in the short pesos position and a reduction in the short dollar position should be observed, although with a greater response from the firm that produces non tradeables.

An over adjustment in terms of the proportions of free assets with respect to their optimal proportions can be seen in both cases, that of firms producing tradeables and that of firms producing non tradeables. That is, in the transition to the new optimal proportions the adjustments in domestic and foreign currency liabilities are higher than their long run value, to compensate for the slower adjustment in the fixed asset. The firm that produces tradeable goods initially overadjusts its position in dollars with respect to the long run optimum. This compensates for the increase in asset investments that should have occurred, but that take place only gradually. The firm which produces non tradeable goods decreases its proportion in pesos more than would be optimal in the long run, to compensate for the fact that the reduction in its fixed asset is gradual. The slower and costlier the fixed asset's adjustment, the higher in magnitude and longer in duration will be the over adjustments.

Concerning the firms with FDI, the owner has more assets related to the foreign currency return, so the correlation between the return of its assets and the return of foreign currency is higher. In this case, the incentives to readjust the portfolio in response to a possible devaluation are smaller, so firms with higher FDI do not adjust their portfolios as much.

IV. Empirical analysis of firm's financial decisions

IV.1. Data and aggregation for the analysis of a firm's financial composition

The data come from surveys done by Banco de Mexico and the Ministry of Commerce and Industry on the basis of which the official statistics of FDI are constructed. These surveys provide the financial balance of firms that have foreign participation. The information is available for the period 1990-1997, though the information for 1996 and 1997 is not strictly comparable due to changes in the structure of the survey. Thus, the analysis focuses on the period 1990-1995. The number of firms with foreign participation in the sample grew from 3089 in 1990 to 5043 in 1999 (see table 4.1).

Table 4.1. Available number of surveys to firms.

Year	1990	1991	1992	1993	1994	1995	1996	1997
Firms	3098	3067	3473	3692	4237	4545	4900	5043

As asset proportions of starting firms can be modified substantially without representing substantial changes in aggregate FDI, domestic and foreign liabilities, those firms which showed considerable growth during a year either in total assets or accounting capital were excluded from the sample (growth rates larger than 200%). The firms that showed extreme values of either domestic or foreign assets were also excluded (taking out the bottom and top 5% in either case).

The surveys include the following accounts:

Assets	Liabilities	Accounting Capital
Cash Domestic Currency	Domestic liabilities	Social capital
Cash Foreign Currency	Matrix	Asset revaluation
Deposits	Foreign liabilities	Liability revaluation
Country receivables	Other liabilities	Capital reserves
Matrix		Accumulated profits
Foreign receivables		Profit
Inventories		Accumulated losses
Fixed assets		Loss
Differed assets		

These surveys include the financial balance of firms at the beginning and end of the period. The analysis of proportion levels at a moment in time uses the initial balances for each year, while the analysis of changes in the proportion uses the initial and final information corresponding to the survey of each year.

Table 4.3 reports the correlations between the different asset and liability accounts, both as levels and as differences. The most interesting results are at the difference level, as the correlations between levels basically shows that the firms with more fixed assets and country accounts are those that have more domestic and foreign liabilities. The only accounts that do not have a strong positive correlation with the amount of fixed assets are cash in foreign currency and foreign accounts. This is probably due to the fact that size does not imply whether a firm is producing tradeables and exporting at a given moment in time.

Table 4.3. i) Correlation in levels. Initial levels for the period 1990-1995

	CDC	CFC	DEP	CT.REC	MAT	F.REC	INV	FIXED A.	DIF A.	D.LIA	MAT	F.LIA	OTH
CDC	1.00												
CFC	0.45	1.00											
DEP	0.14	0.10	1.00										
CT.REC	0.23	0.11	0.41	1.00									
MAT	0.09	0.05	0.00	0.04	1.00								
F.REC	0.09	0.24	0.01	0.09	0.10	1.00							
INV	0.28	0.46	0.20	0.27	0.37	0.29	1.00						
FIXED A.	0.21	0.20	0.94	0.43	0.07	0.08	0.40	1.00					
DIF A.	0.17	0.06	0.74	0.39	0.04	0.03	0.15	0.74	1.00				
D.LIA	0.27	0.23	0.45	0.69	0.11	0.17	0.38	0.52	0.46	1.00			
MAT	0.17	0.19	0.00	0.05	0.57	0.34	0.48	0.10	0.03	0.14	1.00		
F.LIA	0.15	0.27	0.66	0.45	0.04	0.12	0.50	0.74	0.53	0.43	0.13	1.00	
OTH	0.15	0.27	0.66	0.37	0.11	0.09	0.49	0.70	0.51	0.39	0.13	0.89	1.00

ii) Correlation in differences. The changes are calculated as the difference between the initial and final level reported in the survey corresponding to that year, period 1990-1995.

	CDC	CFC	DEP	CT.REC	MAT	F.REC	INV	FIXED A.	DIF A.	D.LIA	MAT	F.LIA	OTH
CDC	1.00												
CFC	0.19	1.00											
DEP	0.10	0.08	1.00										
CT.REC	0.05	-0.08	0.17	1.00									
MAT	-0.15	-0.16	0.00	-0.05	1.00								
F.REC	-0.06	0.04	0.00	-0.03	-0.03	1.00							
INV	-0.06	-0.03	-0.49	0.09	0.03	0.00	1.00						
FIXED A.	0.09	-0.01	0.60	0.36	0.01	0.01	-0.14	1.00					
DIF A.	0.12	0.00	0.71	0.32	-0.01	-0.01	-0.29	0.74	1.00				
D.LIA	0.08	0.02	0.40	0.59	0.03	0.05	-0.17	0.44	0.47	1.00			
MAT	0.10	-0.01	0.00	0.03	0.19	0.00	0.02	0.06	-0.01	-0.03	1.00		
F.LIA	0.05	0.11	0.25	0.27	0.02	0.05	-0.19	0.27	0.30	0.16	-0.12	1.00	
OTH	0.06	0.13	0.59	0.13	-0.14	0.04	-0.66	0.39	0.52	0.31	-0.14	0.34	1.00

Initial and final levels are adjusted using the CPI for domestic accounts, and transformed to dollars for external accounts.

In the correlations between differences one can observe that increases in the amount of the fixed asset are associated with increases in the amount of domestic liabilities, which have a high positive correlation with deposits. There is no significant correlation between changes in fixed assets or deposits and external liabilities, which might be due to the fact that firms producing tradeable goods adjust their assets in a different way from firms that produce non tradeables.

Different types of accounts were aggregated into three accounts that are related with the type of asset. These are:

Fixed asset = Domestic receivables+ Inventories + Fixed asset + Differed asset

Domestic asset = Cash domestic currency + Deposits – Domestic liabilities
Foreign asset = Cash foreign currency + Foreign receivables– Foreign liabilities

This aggregation of assets assumes the following:

i) Eventhough foreign liabilities and foreign receivables are classified on the residence of the creditor or debtor, and not the currency of the transaction, it was assumed that they are denominated in foreign currency (dollars). Foreign receivables are included with foreign liabilities due to a positive correlation in returns associated with movements in the exchange rate.

ii) Domestic liabilities and deposits are denominated in domestic currency (pesos), making the same assumptions as in i). The account of other liabilities includes, typically, obligations in domestic currency such as taxes and provisions for personnel liquidation.

iii) Fixed assets and inventories were included as fixed assets as they probably have a similar return. The return on the fixed asset comes from producing the “final” goods that are kept as inventories, so a reduction in the return of the fixed asset implies a reduction in the return of the final goods in the inventory.⁷

iv) The differed assets account normally includes receivables or trade credits of a longer maturity than those included in the domestic accounts. It was assumed that this account was denominated in domestic currency, so it was included with domestic receivables.⁸ Both were included in the fixed asset because a reduction of value in the produced good will lead to smaller payments of these accounts.⁹

The accounts of assets and liabilities with the matrix were not included as they do not represent real changes in the net wealth of the owner-investor, and respond more to accounting and taxing purposes. Otherwise, and increase in asset with the matrix would imply there was an increase in accounting capital and wealth of the owner-investor without there being any change in this.

IV.3. Analysis of the level of asset proportions

The theoretical model presented in section III predicts that in any given year, the firms whose fixed asset has a larger correlation with assets in foreign currency go shorter on these assets, and less short on domestic currency assets. The same happens if a firm has more FDI, as the foreign owners have other foreign assets. In order to test this hypothesis,

⁷A positive return on inputs that are kept in the inventory might imply a smaller return on the fixed assets if the firm can not increase its prices one to one with the increase in input prices. As the firm can do this, at least partially, and as the proportion of inputs are small for most firms, it will be assumed that the positive correlation in returns dominates.

⁸This can be justified by observing the correlation between domestic accounts and foreign accounts.

⁹There is also a smaller payment of foreign receivables, but we assumed that the effect of changes in the exchange rate dominates in this case. Possible extensions are analyzing whether the results are qualitatively different if one includes domestic accounts in domestic currency assets.

firm were separated into tradeable and non tradeable producing firms. They were also separated into small, medium and large firms to control for the possibility of credit constraints.

The mean, standard deviation and median of the proportions calculated dividing by the amount of fixed asset are reported in table 4.4. Firms on average keep a short position in domestic currency assets of, approximately, 30% of the fixed asset. They also keep a short position, albeit smaller, in foreign assets, of 7.5% of the fixed asset. This might be due to the fact that, eventhough there is a large amount of firms producing tradeable goods, a sizeable amount of their sales takes place in the country, and it is costly to adjust the amount of domestic and foreign sales. It does not seem to be due to credit restrictions, as this happens for firms of all sizes, as can be checked by dividing the sample in three into small, medium and large firms.¹⁰ The standard deviation tends to be larger in all cases for the proportion of domestic assets.

Table 4.4. I) Mean, standard deviation and median of the peso liabilities proportions. Initial period data.

		1990	1991	1992	1993	1994	1995
Firms with FDI<49%	Mean	-0.3089	-0.3191	-0.3132	-0.3130	-0.3399	-0.3515
	St.dev	0.2991	0.3146	0.3093	0.2966	0.3066	0.3316
	Median	-0.2341	-0.2236	-0.2235	-0.2456	-0.2832	-0.2575
Firms with FDI>49%	Mean	-0.3037	-0.2735	-0.2652	-0.2800	-0.3020	-0.3064
	St.dev	0.2964	0.3032	0.3067	0.3124	0.3287	0.3409
	Median	-0.2237	-0.1676	-0.1707	-0.1683	-0.1971	-0.1867
Small Firms	Mean	-0.3636	-0.3982	-0.2929	-0.2905	-0.3338	-0.3311
	St.dev	0.3615	0.4002	0.3134	0.3239	0.3338	0.3474
	Median	-0.2491	-0.2938	-0.2007	-0.1845	-0.2309	-0.2157
Medium Firms	Mean	-0.2914	-0.2766	-0.2866	-0.2949	-0.3095	-0.3213
	St.dev	0.2813	0.2904	0.3099	0.3044	0.3246	0.3374
	Median	-0.2056	-0.1788	-0.1938	-0.2055	-0.2165	-0.2098
Large Firms	Mean	-0.2745	-0.2388	-0.2728	-0.3040	-0.3033	-0.2959
	St.dev	0.2554	0.2504	0.3097	0.3231	0.3220	0.3257
	Median	-0.2196	-0.1588	-0.1728	-0.1926	-0.2092	-0.1842
Tradeables	Mean	-0.3716	-0.4791	-0.2855	-0.3480	-0.3124	-0.3100
	St.dev	0.8824	1.1549	1.0114	0.9273	0.8052	0.6977
	Median	-0.2452	-0.2342	-0.1988	-0.2098	-0.2187	-0.1877
Non tradeables	Mean	-0.4445	-0.5438	-0.3884	-0.3537	-0.3621	-0.4282
	St.dev	1.4468	1.6307	1.3067	1.4372	1.2147	1.4796
	Median	-0.1841	-0.1853	-0.1236	-0.1526	-0.1795	-0.2069

¹⁰ There might be some degree of credit constraints as there is a large amount of firms that keep no position in foreign currency during all the years in the sample.

Table 4.4 II) Mean, standard deviation and median of the dollar liabilities proportions. Initial period data.

		1990	1991	1992	1993	1994	1995
Firms with FDI<49%	Mean	-0.0580	-0.0305	-0.0527	-0.0667	-0.0684	-0.0780
	St.dev	0.1512	0.1281	0.1404	0.1645	0.1663	0.1742
	Median	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Firms with FDI>49%	Mean	-0.0620	-0.0358	-0.0738	-0.0773	-0.0890	-0.0957
	St.dev	0.1707	0.1359	0.1788	0.1880	0.2022	0.2196
	Median	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Small Firms	Mean	-0.0762	-0.0515	-0.0719	-0.0828	-0.0827	-0.0881
	St.dev	0.1999	0.1555	0.1787	0.1952	0.1923	0.2054
	Median	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Medium Firms	Mean	-0.0670	-0.0567	-0.0810	-0.0807	-0.0837	-0.0979
	St.dev	0.1767	0.1563	0.1876	0.1884	0.1969	0.2127
	Median	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Large Firms	Mean	-0.0617	-0.0116	-0.0691	-0.0751	-0.0965	-0.0930
	St.dev	0.1523	0.0997	0.1650	0.1823	0.2041	0.2147
	Median	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Tradeables	Mean	-0.1227	-0.2536	-0.1319	-0.1365	-0.1533	-0.1817
	St.dev	0.9741	1.1802	0.6309	0.6788	0.7550	0.7036
	Median	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Non tradeables	Mean	-0.0267	-0.2307	-0.0347	-0.0512	-0.0823	-0.0380
	St.dev	0.7804	1.2463	0.4714	0.7944	0.6826	0.9183
	Median	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000

Firms with more FDI are less short on domestic assets, both looking at the mean and the median, and more short on foreign assets in terms of means. The same thing happens when looking at firms that produce tradeables.

Table 4.5 includes the results from running the proportion of domestic and foreign assets using OLS, including dummy variables for the different years. The other variables included are a dummy when the proportion of FDI in a firm exceeds 49%, a dummy for firms that produce tradeable goods, and dummies for size of firms. It is found that firms that have a higher proportion of FDI have a less short position in domestic assets, as predicted by the theory. This is true when including all combinations of variables. The coefficient of FDI in the foreign asset regressions is never significant. Firms that produce tradeable goods have a larger short position on foreign assets in all possible specifications, also as predicted by the theory. As firms grow they seem to have a less short position on domestic assets, but there is no significant effect concerning foreign assets.

Year dummies show a consistent picture in all regressions. The regressions were done using the initial values in each survey, so the dummy corresponds to the initial value of the proportions in the beginning of the mentioned year. The short position in domestic assets increases during the period, particularly during 1993 and 1994, corresponding to survey dummies 94 and 95. The same thing happens with the proportion of foreign assets, though the increase observed in 1994 is smaller than would be expected due to the depreciation at the end of 1994. The exchange rate depreciated 74% during the year, while the average short proportion of foreign assets seems to have increased by less than that. This really means that the proportion of foreign assets remained constant or fell

during 1994. This coincides with the adjustment predicted by the model in case of an increase in the returns of foreign assets.

Table 4.5. Regressions of the proportion of domestic and foreign liabilities on firm characteristics and year dummies.

	Peso Liabilities				
	(1)	(2)	(3)	(4)	(5)
Constant	-32.764 *** (0.832)	-30.594 *** (0.867)	-33.164 *** (0.879)	-33.155 *** (0.958)	-35.388 *** (1.008)
Dfdi	4.126 *** (0.584)				4.114 *** (0.584)
Dtrd		0.065 (0.568)			
Dmed			2.857 *** (0.676)		
Dlge			4.386 *** (0.673)		
Dtrdmed				3.155 *** (0.836)	3.167 *** (0.835)
Dtrdlge				4.011 *** (0.831)	3.934 *** (0.83)
Dntrdsma				-0.020 (0.993)	0.108 (0.991)
Dntrdmed				2.227 ** (1.014)	2.342 ** (1.012)
Dntrdlge				5.128 *** (1.005)	5.287 *** (1.004)
D91	0.866 (1.085)	1.078 (1.087)	1.017 (1.085)	1.017 (1.085)	0.806 (1.084)
D92	1.777 * (1.013)	2.090 ** (1.014)	2.298 ** (1.013)	2.285 ** (1.014)	1.966 * (1.013)
D93	0.335 (1.01)	0.851 (1.01)	1.034 (1.008)	1.053 (1.009)	0.535 (1.010)
D94	-1.787 * (0.996)	-1.026 (0.992)	-0.854 (0.991)	-0.853 (0.991)	-1.616 (0.995)
D95	-2.030 ** (0.99)	-1.089 (0.983)	-0.913 (0.981)	-0.927 (0.982)	-1.876 * (0.99)
R2 adjusted	0.005	0.001	0.004	0.004	0.008
F	11.500	3.180	8.930	6.470	10.420

* 10% Significance, ** 5% Significance, *** 1% Significance

Dollar Liabilities										
	(1)		(2)		(3)		(4)		(5)	
Constant	-6.831	***	-3.346	***	-6.836	***	-8.203	***	-8.373	***
	(0.484)		(0.499)		(0.511)		(0.553)		(0.582)	
Dfdi	0.120								0.312	
	(0.34)								(0.337)	
Dtrd			-4.940	***						
			(0.327)							
Dmed					-0.335					
					(0.393)					
Dlge					0.509					
					(0.391)					
Dtrdmed							-0.626		-0.625	
							(0.483)		(0.483)	
Dtrdlge							0.412		0.406	
							(0.48)		(0.48)	
Dntrdsma							4.225	***	4.235	***
							(0.573)		(0.573)	
Dntrdmed							4.974	***	4.983	***
							(0.585)		(0.585)	
Dntrdlge							5.428	***	5.440	***
							(0.58)		(0.58)	
D91	2.952	***	2.942	***	2.951	***	2.929	***	2.913	***
	(0.632)		(0.626)		(0.631)		(0.626)		(0.63)	
D92	-0.637		-0.806		-0.617		-0.824		-0.849	
	(0.589)		(0.584)		(0.589)		(0.585)		(0.586)	
D93	-1.198	**	-1.304	**	-1.172	**	-1.328	**	-1.368	**
	(0.588)		(0.582)		(0.587)		(0.582)		(0.584)	
D94	-2.029	***	-2.194	***	-2.001	***	-2.206	***	-2.264	***
	(0.579)		(0.571)		(0.576)		(0.572)		(0.575)	
D95	-2.563	***	-2.926	***	-2.522	***	-2.930	***	-3.002	***
	(0.576)		(0.566)		(0.571)		(0.567)		(0.572)	
R2 adjusted	0.008		0.024		0.008		0.024		0.024	
F	18.560		56.820		16.600		34.960		31.860	

* 10% Significance, ** 5% Significance, *** 1% Significance

IV.4. Analysis of the changes in asset proportions

The theoretical model also has implications with respect to the changes in asset proportions from one period to the next. In order to analyze if the changes in proportions are consistent with the model, I focused on the period 1994-1995. In 1994, if agents were expecting a devaluation of the currency they should have reduced their short position in foreign assets and increased their short positions in domestic currency. In 1995, after the devaluation, domestic interest rates increased considerably, so firms should have tried to reverse their adjustments from the previous period.

However, it should be noted that there were additional changes. In particular, the variance of returns increased for both types of assets. This would lead to a reduction in the proportions of all the assets, including the fixed one, so the overall change in domestic and foreign proportions is ambiguous. An additional issue is that NAFTA came into effect on January 1st 1994. This might have increased the return on tradeables in a substantial way, leading to an increase of both short positions in domestic and foreign assets, though larger on this last one.

Table 4.6 reports the mean, standard deviation and median of the changes in proportions during the period 1990-1995. As mentioned, our focus is 1994 and 1995. In 1994 all firms increased their domestic liabilities as expected. The only consistent difference in means and medians between firms is the fact that firms that produce tradeables seem to have increased their domestic liabilities somewhat more. This is consistent with an increase in the return of their fixed asset due to NAFTA. The proportion of foreign liabilities at the end of the year is also generalized, though this is partly due to the devaluation of the exchange rate, implying that the real increase of liabilities in dollar terms is much smaller. The only significant difference across groups is that firms producing tradeables increased their foreign liabilities by a larger amount than firms producing non-tradeables, again consistent with NAFTA.

Table 4.6. I) Mean, standard deviation and median of the change in the proportion of peso liabilities.

		1990	1991	1992	1993	1994	1995
Firms with FDI<49%	Mean	-0.0137	-0.0171	-0.0305	-0.0242	-0.0243	-0.0477
	St.dev	0.2117	0.2217	0.2169	0.2177	0.2319	0.2609
	Median	-0.0009	0.0040	-0.0030	-0.0003	0.0000	-0.0022
Firms with FDI>49%	Mean	-0.0119	-0.0083	-0.0261	-0.0283	-0.0272	-0.0308
	St.dev	0.2329	0.2303	0.2105	0.2368	0.2444	0.2530
	Median	0.0021	0.0032	0.0000	-0.0011	0.0000	-0.0016
Small Firms	Mean	-0.0153	-0.0246	-0.0310	-0.0188	-0.0272	-0.0246
	St.dev	0.2851	0.3014	0.2192	0.2346	0.2434	0.2671
	Median	0.0000	0.0014	-0.0007	-0.0009	0.0000	0.0003
Medium Firms	Mean	-0.0205	-0.0185	-0.0287	-0.0348	-0.0237	-0.0345
	St.dev	0.2110	0.2191	0.2082	0.2289	0.2384	0.2560
	Median	0.0004	0.0028	-0.0015	-0.0010	-0.0004	-0.0010
Large Firms	Mean	-0.0035	0.0027	-0.0237	-0.0274	-0.0283	-0.0451
	St.dev	0.1783	0.1682	0.2118	0.2282	0.2412	0.2416
	Median	-0.0003	0.0064	-0.0002	-0.0005	0.0012	-0.0076
Firms with tradeables	Mean	-0.0186	-0.0099	-0.0285	-0.0272	-0.0263	-0.0337
	St.dev	0.2183	0.2233	0.2156	0.2282	0.2336	0.2465
	Median	-0.0022	0.0070	-0.0039	-0.0053	-0.0005	-0.0044
Firms with non tradeables	Mean	0.0019	-0.0157	-0.0264	-0.0269	-0.0259	-0.0367
	St.dev	0.2305	0.2333	0.2085	0.2355	0.2533	0.2677
	Median	0.0026	0.0012	0.0000	0.0000	0.0006	-0.0004

Table 4.6. II) Mean, standard deviation and median of the change in the proportion of dollar liabilities.

		1990	1991	1992	1993	1994	1995
Firms with FDI<49%	Mean	-0.0251	-0.0096	-0.0262	-0.0203	-0.0364	-0.0139
	St.dev	0.1233	0.1033	0.1280	0.1165	0.1274	0.1303
	Median	0	0	0	0	0	0
Firms with FDI>49%	Mean	-0.0203	-0.0188	-0.0233	-0.0260	-0.0331	-0.0311
	St.dev	0.1221	0.1084	0.1234	0.1301	0.1414	0.1654
	Median	0	0	0	0	0	0
Small Firms	Mean	-0.0281	-0.0236	-0.0197	-0.0258	-0.0326	-0.0284
	St.dev	0.1232	0.1215	0.1212	0.1293	0.1360	0.1538
	Median	0	0	0	0	0	0
Medium Firms	Mean	-0.0247	-0.0131	-0.0229	-0.0231	-0.0334	-0.0229
	St.dev	0.1294	0.1139	0.1293	0.1215	0.1368	0.1631
	Median	0	0	0	0	0	0
Large Firms	Mean	-0.0165	-0.0113	-0.0306	-0.0235	-0.0359	-0.0296
	St.dev	0.1155	0.0870	0.1249	0.1264	0.1399	0.1564
	Median	0	0	0	0	0	0
Firms with tradeables	Mean	-0.0238	-0.0135	-0.0305	-0.0300	-0.0397	-0.0328
	St.dev	0.1306	0.1080	0.1380	0.1369	0.1475	0.1737
	Median	0	0	0	0	0	0
Firms with non tradeables	Mean	-0.0208	-0.0190	-0.0137	-0.0128	-0.0237	-0.0181
	St.dev	0.1036	0.1036	0.0991	0.1003	0.1171	0.1292
	Median	0	0	0	0	0	0

The results for 1995 show a similar story. All firms increased their domestic liabilities, though in this case there are significant differences. Firms with less FDI increased the proportion of domestic liabilities by a larger amount, while firms with more FDI increased the proportion of foreign liabilities by more. In terms of size of firms, larger firms increased their domestic liabilities by a larger amount. Firms producing tradeable goods increased their proportion of foreign liabilities by a larger amount. It should be noted that investment decreased significantly during 1995, so the increase in asset proportions was probably accompanied in many cases by a reduction in the amount of fixed assets. In addition, the increase in domestic interest rates made it difficult for firms to pay their domestic liabilities. Part of the observed increase in domestic liabilities is probably due to the fact that, in many cases, interest payments were refinanced and appeared as a larger proportion of domestic liabilities. Thus the most important results are those in terms of differences between firms. Firms with more FDI obtained resources from abroad instead of resources from domestic sources, while firms with less FDI did the reverse.

Table 4.7 shows the results from regressions of domestic and foreign asset proportions on several firm characteristics for 1994 and 1995. They basically confirm the above mentioned results. In 1994, firms producing tradeables and with more FDI seem to have gone shorter in domestic currency, though the coefficients are not significant. Firms producing tradeables increased their short position in foreign currency. In 1995, larger firms increased their peso liabilities by a larger amount, while firms producing tradeables and with more FDI increased their short peso positions by a smaller amount. In terms of

foreign currency, firms with more FDI and firms that produce tradeables increased their short position.

Table 4.7. Regressions of the change in the proportion of domestic and foreign liabilities on firm characteristics. Years: 1994-1995

	Changes in Liabilites for 1994							
	Peso Liabilites				Dollar Liabilites			
	(1)	(2)	(3)	(4)	(1)	(2)	(3)	(4)
Constant	-2.513 *** (0.921)	-2.632 *** (0.819)	-2.286 * (1.301)	-3.238 ** (1.358)	-3.908 *** (0.556)	-2.543 *** (0.494)	-2.743 *** (0.785)	-4.340 *** (0.819)
Dfdi	-0.581 (1.087)		-0.540 (1.092)	-0.559 (1.092)	0.386 (0.656)		0.548 (0.658)	0.576 (0.659)
Dtrd		-0.462 (1.017)	-0.413 (1.022)			-1.683 *** (0.614)	-1.725 *** (0.617)	
Dmed			0.119 (1.205)				-0.264 (0.727)	
Dlge			-0.088 (1.199)				-0.231 (0.723)	
Dtrdmed				1.238 (1.506)				-0.883 (0.908)
Dtrdlge				0.425 (1.49)				-0.066 (.898)
Dntrdsma				1.925 (1.783)				1.319 (1.075)
Dntrdmed				0.072 (1.774)				2.155 ** (1.070)
Dntrdlge				0.957 (1.799)				0.728 (1.085)
R2 adjusted	-0.0003 0.290	-0.0003 0.210	-0.0014 0.120	-0.0015 0.340	-0.0003 0.350	0.0025 7.520	0.0017 2.090	0.0019 1.800

* 10% Significance, ** 5% Significance, *** 1% Significance

Changes in Liabilites for 1995												
	Peso Liabilites				Dollar Liabilites							
	(1)	(2)	(3)	(4)	(1)	(2)	(3)	(4)	(1)	(2)	(3)	(4)
Constant	-4.767 ***	-3.669 ***	-3.892 ***	-3.317 **	-1.395 **	-1.809 ***	-0.740	-2.379 ***				
	(1.125)	(0.768)	(1.318)	(1.392)	(0.606)	(0.475)	(0.815)	(0.860)				
Dfdi	1.690		1.681	1.745	-1.719 **		-1.657 **	-1.677 **				
	(0.980)		(1.126)	(1.128)	(0.696)		(0.696)	(0.697)				
Dtrd		0.303	0.263			-1.467 **	-1.430 **					
		(0.986)	(0.987)			(0.610)	(0.610)					
Dmed			-1.000				0.600					
			(1.185)				(0.732)					
Dlge			-2.050 *				-0.107					
			(1.182)				(0.731)					
Dtrdmed				-1.077				0.831				
				(1.519)				(0.939)				
Dtrdlge				-3.049 **				0.321				
				(1.533)				(.948)				
Dntrdsma				-1.140				1.974 *				
				(1.713)				(1.059)				
Dntrdmed				-2.102				2.240 **				
				(1.750)				(1.082)				
Dntrdlge				-1.710				1.239				
				(1.713)				(1.059)				
R2 adjusted	0.0004	-0.0003	0.0005	0.0002	0.0018	0.0017	0.0031	0.0025				
	2.250	0.090	1.330	1.110	6.110	5.790	3.140	2.180				

* 10% Significance, ** 5% Significance, *** 1% Significance

V. Conclusions

It was found that firms behave in a way that is consistent with the owner maximizing a portfolio of assets with different returns. In particular, domestic liability proportions are larger than foreign liability proportions, firms that produce tradeable goods have a shorter position in foreign currency, and firms with more FDI have a less short position in domestic currency. This does not seem to come from credit constraints, as the results find no significant differences between different sizes of firms.

Changes in proportions from one year to another are considerably small. They again seem consistent with the theoretical model. In particular, NAFTA seems to have played a major role by leading firms with more FDI and firms that produce tradeables to increase their foreign asset proportions due to the increase in their expected returns.

There is no evidence that shows that firms with more FDI increased their domestic liabilities and reduced their foreign liabilities more than firms with less FDI before the 1994 crisis. After the crisis, they increased their foreign liabilities by a significant amount, even controlling for whether they produced tradeable goods or not, providing a valuable source of funds after the crisis.

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