Financial Dollarization and Debt Deflation Under a Currency Board: The Case of Argentina

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I. Introduction

Firm-level effects of exchange rate volatility have been increasingly at the center of the exchange rate regime debate for developing economies. It underscores their propensity to limit exchange rate variability (Calvo and Reinhart's (2002) "fear of floating") and the devastating real impact of recent currency collapses. In a nutshell, the so-called "balance sheet" approach emphasizes that, by funding domestic credit in a foreign currency (either through dollarized domestic savings or through foreign borrowing), systemic exposure to exchange rate risk increases either at the bank level (if financial regulations allow institutions to run unbalanced foreign currency positions) or, more typically, directly at the firm level (more precisely, through the exchange rate risk exposure of dollar indebted non-dollar earners). The approach has also been used along these lines both to explain the propensity of developing economies to reduce exchange rate volatility under any de jure exchange rate regime, and to argue in favor of the adoption of superfixed exchange rate arrangements (including unilateral dollarization).1

However, exchange rate-related balance sheet effects are a more general phenomenon ultimately derived from the lack of a strong national currency. More precisely, emerging economies tend to have *weak currencies*, namely, currencies that are not accepted as store of value either domestically or internationally.2

In the domestic case, the immediate symptom is that the public prefers to save mainly in a foreign currency (inducing financial dollarization)3 or, if this is restricted by the monetary authorities, in short-term local currency assets or directly offshore. As a result, when financial dollarization is allowed, debtors from the non-tradable sector end up with debts denominated in tradables, increasing their exchange rate exposure. On the contrary, when not dollarized, "a country with a weak currency displays pronounced short-termism in financial contracts, with investors lured towards the peso by instruments that re-price very frequently (e.g., deposits with

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1 Examples include, among others, Calvo (2002) and Haussman, Panizza and Stein (2001).

2 While the literature has pointed at institutional (e.g., lack of central bank independence coupled with persistent fiscal deficits) and historical factors (e.g., an inflationary past) to account for the origins of the weak currency problem, they appear to be more complex than these partial explanations suggest. At any rate, the issue has not yet received its deserved attention.

3 Following Ize and Levy Yeyati (2001), by financial dollarization we refer to the holding by residents of foreign currency-denominated assets and liabilities.

interest rates that adjust daily in line with the overnight rate)."[4] The third alternative, namely the off-shorization of domestic intermediation when on-shore dollarization is restricted, again introduces, albeit in a hidden way, a systemic currency mismatch problem, as witnessed in the case of pre-crisis Ecuador.

While the literature has tended to focus on the adverse effects of an unexpected nominal devaluation in the presence of (bank- or firm-level) currency mismatches, balance sheet effects are related to the more general issue of the use of exchange rates as an adjustment mechanism in the face of external shocks and, in particular, the transition to a more depreciated *real* exchange rate (RER) in financially dollarized economies.[5] In this regard, it is essential to note that a superfixed regime that successfully prevents a sharp nominal devaluation does not protect a country from the balance sheet effects of an RER adjustment.[6] On the contrary, under a peg, RER overvaluation is corrected through a process of deflation that reduces the relative price of non-tradables eroding the capacity to pay of debtors from the non-tradable sector *regardless of the currency of denomination of their loans*, in line with Fisher's (1933) classical "debt deflation" argument.[7] By contrast, in a country *without* financial dollarization, the adjustment to a more depreciated equilibrium RER that comes through nominal depreciation of a flexible exchange rate *improves* (via debt dilution) the capacity to pay of debtors in the non-tradable sector, partially offsetting the negative impact of the devaluation through a rise in the price of tradable inputs.[8] At any rate, balance sheet and debt deflation effects can be regarded to a large extent as two sides of the same real exchange rate exposure problem in dollarized economies.

Although, in general, not fully dollarized weak currency economies are likely to suffer from *both* currency and maturity mismatches, intuitively, countries where the first one is prevalent will tend to carefully manage their exchange rates while those where the second

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4 De la Torre, Levy Yeyati and Schmukler (2002a). Argentina is a good example of the first type: In the currency board period, financial dollarization was not only tolerated but also fostered by the authorities. A good example of the second type is Brazil, where not only dollar intermediation is severely restricted but also interest rate indexation has been widely used in the past as a "policy crutch" to bolstered financial intermediation in the local currency.
5 The point has been stressed by Céspedes, Chang and Velazco (2000).
6 See Roubini (2001).
7 In addition, domestic nominal rigidities make this process long and painful through companion quantity adjustments (higher unemployment and slower growth), with important potential spillovers to tradables producers as well.
8 See Obstfeld (2001). Moreover, if the debt bears fixed interest rates (as is usually the case in Argentina), peso debt behaves countercyclically, as non-tradable producers benefit from the partial pass-through of a nominal devaluation to domestic prices while the debt burden remains constant. Real exchange rate risk, in this case, is born by the

problem dominates will adapt their monetary policy in order to minimize the real effects of an interest rate defense of the exchange rate. Thus, irrespective of the de jure regime reported by the country, the de facto exchange rate policy will be to a large degree determined by the relative importance of currency and maturity mismatches, and their perceived consequences.9

Moreover, balance sheet effects are a crucial ingredient in the design of prudential regulation, typically biased towards an industrial country perspective (that is, a perspective from a non-dollarized strong currency economy). In particular, while the Basle standards have increasingly incorporated market risk in their prudential framework, standard prudential measures (such as limits to bank-level currency positions) tend to understate the credit risk associated to currency imbalances at the level of the firm, particularly in light of the large real exchange rate swings that characterize developing countries.

In spite of their growing importance in both policy and theoretical debates, the empirical relevance of balance sheet and debt deflation effects remains largely an open question. On this front, the analytical literature contrasts with the scarcity of empirical studies assessing the real magnitude of these effects in developing countries. This project intends to contribute to fill this void analyzing debt deflation effects generated by real exchange rate adjustments under a peg economy in the late years of the Argentine Convertibility period.

Our paper relates to previous articles on the firm-level effects of exchange rate fluctuations. Bleakley and Cowan (2002) analyze the effect on investment of holding foreign-currency denominated debt during devaluations using a sample of 500 non-financial publicly traded companies from five Latin American countries. They find that the expansionary competitiveness effect associated to exchange-rate realignments offsets the potential contractive balance sheet effect on investment. They also find that, after depreciations, earnings are higher for firms holding more dollar debt, suggesting the presence of investment opportunities that arise from the change in relative prices. Thus, the authors conclude that there is no severe currency mismatch of output and liabilities. Firms match the currency composition of their debt with the exchange rate elasticity of their income.

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lender. The impact on tradable producers, on the other hand, should be neutral inasmuch as they hold hedged exchange rate positions.

Forbes (2002) analyzes firm effects on publicly traded companies from 42 countries to examine the impact of 12 major currency depreciations. She finds no significant debt effects on performance after depreciations (the currency composition of debt is not analyzed), although firms with higher debt ratios tend to show lower net income growth. As expected, firms with a higher share of foreign sales exposure perform better after depreciations. In the year after depreciations, firms show larger growth in market capitalization than in net income suggesting that the reallocation of resources forced by devaluations need time to materialize, although these effects are anticipated by market values.

A series of articles look at the determinants of capital structure and balance-sheet effects for Mexican companies around the Tequila crisis. Martinez and Werner (2002)'s results are closest to ours. They find that, during the fixed exchange-rate period before the December 1994 crisis, companies show no relationship between the currency composition of their debt and output. Instead, under a floating regime after the Tequila crisis, companies are less likely to show currency mismatches between debt and output. These results are contradicted by Aguiar (2002) and Gelos (2003), who find a positive relationship between firms' foreign-currency denominated debt and exports before the crisis. Interestingly, Aguiar (2002) is the author that finds stronger balance-sheet effects. He argues that, although exporters outperform importers after the devaluation, investment is constrained by weak balance sheets that limit the expansionary devaluation effects for both sectors.

Finally, Campa and Goldberg (1999) and Nucci and Pozzolo (1999) consider the effect of exchange rate fluctuations on investment decisions at the industry and firm level, respectively. As expected, they find that positive effects of a depreciation of the local currency are associated to larger shares of exports as percentage of total firm production, and negative effects are associated to the share of imported inputs. While these studies do not consider balance-sheet effects directly (and use no financial information), the reported effects of exchange rate suggest that firms are not perfectly hedged against exchange rate risk.

Most of the existing literature on balance sheet effects focuses on fluctuations in the nominal exchange rate, either under a flexible regime or as a result of the collapse of a peg. By contrast, our study addresses the impact of debt deflation, namely the effect of an adverse

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9 See Levy Yeyati and Sturzenegger (2002b), and references therein.

external shocks under a peg through changes in the real exchange rate and price deflation in the local currency. As price deflation induces increases in the real value of the debt regardless of the currency denomination, balance sheet effects through both dollar and peso denominated debt are considered in our study.10

Our focus here lies on two potentially relevant fronts stressed by the analytical literature: i) the incidence of exchange rate policy on the currency composition of private debt, and ii) the incidence of real shocks on firms with real exchange rate exposures.

In the case of Argentina, the first issue relates to the incentives associated with exchange rate risk-taking provided by different exchange rate policies and, in particular, to moral hazard considerations arising from the perception of implicit exchange rate guarantees in fixed exchange rate regimes. The relevant question here is whether a peg creates an implicit exchange rate guarantee that reduces the firms' willingness to pay the cost of hedging their positions (in the case of non-tradable producers, by paying the additional cost of peso funding). Two explanations can be built for this guarantee. On the one hand, it has been argued that widespread financial dollarization makes an eventual exit even more costly due to the associated balance sheet effects, forcing the government to defend the exchange rate at the cost of the whole economy. Similarly, when and if the exchange rate eventually becomes unsustainable, the government may be moved, for the same reasons, to bail out dollar debtors, again at the expense of the whole economy. In both cases, financial dollarization creates an externality not internalized by the individual dollar borrower / lender. Underlying this issue is the more general question of whether the market correctly prices market risk, and how financial regulation needs to be adapted to account for market imperfections.11

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10 There is significant heterogeneity in the methodologies used by these previous studies. The main differences regard the treatment of individual effects (the studies use firm effects, country effects, or no effects), the control of aggregate shocks (the authors consider no year effects with clustered standard errors, years effects, non-country specific years effects, etc.) and the econometric treatment of potential endogeneity (OLS, 2SLS, and GMM estimators are considered).

11 Note that prudential norms limited at the time the exposure to exchange rate risk at the bank level, but were completely silent regarding currency mismatches at the firm level. In particular, no discrimination was made in relation to the tradable component of debtors' production mix. From a normative perspective, the question intends to explore whether the risk associated with a currency mismatch between earnings and financial costs in the non-tradable sector was internalized by the firms. For more general discussions on ways in which a peg may induce financial dollarization, see Ize and Levy Yeyati (2001), Burnside et al. (2000) and Broda and Levy Yeyati (2002).

The second issue is directly related to the implications of a pegged exchange rate regime and to the dilemma between nominal deflation and devaluation (alternatively, debt deflation or balance sheet effects) as a response to a substantial RER misalignment.12 As pointed out by De la Torre et al. (2002a), while in principle there is a symmetry between the two, as both eventually converge to an equilibrium RER level, in practical terms there is also a tradeoff between gradualism (at the cost of a long recession with potentially irreversible losses) and shock therapy (at the cost of financial disruptions and a higher incidence of bankruptcies). In the case of Argentina, and given the fact that, at the time of writing, there is little reliable balance sheet data for the post-devaluation period, the adjustment costs analyzed in the paper (or, more generally, the incidence of currency mismatches on firm performance) are entirely related with the evolution of deflation and its consequences.13 Trivially, no conclusion could be extracted concerning standard devaluation-related balance sheet effects based on the sample analyzed in this study. The reason should be clear: Inasmuch as the nominal exchange rate is kept constant, there is no direct impact of the currency of denomination of corporate debt.14

However, debt composition may have affected performance through the anticipation of a devaluation, a hypothesis that we explore in the paper. Absent exchange rate guarantees, currency mismatched firms (for example, firms with higher dollar debt ratios) are likely to reduce dollar indebtedness or to downsize their investment plans in anticipation of the negative impact of a devaluation on their net cash flows. In this case, it is not the actual exchange rates but rather indications of a future nominal exchange rate adjustment that should influence the firms' decision regarding both the currency composition and investment plans.

Exploring the empirical answer to the previous questions requires the presence of important variability in both the real exchange rate and the expected devaluation. The late 1990s in Argentina satisfies these requirements. The real exchange rate witnessed important variations, as did devaluation expectations as measured from peso-dollar interest rate spreads. In the first

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12 Levy Yeyati and Sturzenegger (2002a) emphasize the importance of ex-ante financial dollarization in the assessment of the relative benefits of de jure dollarization. De la Torre et al. (2002a) discuss the decision to exit a currency board in light of the 2001 Argentine crisis.

13 Note that the pesification (that is, the compulsory conversion of dollar liabilities at a one-to-one exchange rate) of all domestic liabilities that followed the devaluation all but eliminated any potential balance sheet effect, so that an assessment of the latter in Argentina will remain a speculative issue. However, a proxy analysis could be conducted based on external corporate exposure, exploiting the fact that external debt could not be unilaterally converted.

14 Interestingly, Bleakley and Cowan's (2002) analysis covers Argentina under the convertibility years, even though no nominal exchange rate movement materialized during that period.

case, the steady appreciation of the dollar vis à vis other currencies that characterized the 1990s was compounded by the stream of devaluations triggered by the Asian crises and the Russian default that led, finally, to the devaluation of the Brazilian real in 1999. In the second case, both the Mexican (Tequila) crisis and the combination of the Russian default and the collapse of the Brazilian real fueled substantial fluctuations in currency risk (that later on mirrored the evolution of the Argentine crisis in 2001).

We exploit these two elements, plus a rich firm-level panel database, to investigate the firm-level response to real exchange rate changes in terms of the currency composition of their liabilities, and the differential effect of a RER adjustment through debt deflation on firm performance. To our knowledge, there are no previous empirical studies analyzing these issues using Argentine data.

The map of this report is as follows. Section 2 describes the database. Section 3 lists the hypotheses to be tested empirically. Section 4 describes the methodological approach. Section 5 discusses the empirical results. Finally, section 6 concludes.

II. Database Description

We study the evolution of companies' balance sheets from 1993 to 2001. The sample starts in 1993 as data availability and quality becomes poorer for earlier years. Our last observations correspond to 2001, right before the devaluation and pesification of loans and deposits that ended the currency board period. Thus, our sample comprises almost all the Convertibility era including the Tequila crisis and the final recession that started in 1998.

We consider annual observations using information from companies' balance sheets. We restrict our sample to non-financial companies. Given that currency mismatches are affected by regulation, the capital structure of banks is not comparable with the behavior of non-financial companies. Our estimation methodology requires the use of lagged variables as instruments. This forces us to exclude companies for which balances are not available for some intermediate year. To avoid having a panel of very short duration, we also exclude companies for which there are less than four years of information after 1995. Our sample of firms is composed of three types of

companies: publicly traded companies, publicly held but not publicly traded companies, and privatized companies.

Information from publicly traded companies is available from the Buenos Aires Stock Exchange. We consider all the non-financial publicly traded companies for which there is a minimum of four observations from contiguous years since 1995. A total of 71 companies satisfy these conditions. The data from these publicly traded companies was obtained from the financial data company *Economatica*.

To complete our database we took advantage of the fact that a large number of formerly state-owned companies were privatized in Argentina. The privatization process took place during the period 1990-98. Although most of these companies are not publicly traded, they are obliged to report their financial information to the regulatory agencies. We followed the balance sheets presented by the privatized companies to the regulatory agencies of the Air Transport, Airports, Electricity, Gas, Telecommunications, Water and Sewerage, Railways, and Postal Services sectors.15 Financial data for a total of 56 non-financial privatized companies (with at least four observations from contiguous years since 1995) were obtained through this process.16

We completed our database tracking data from non-publicly-traded non-privatized companies. We found that some companies which are not publicly traded present regularly their financial information to the Buenos Aires Stock Exchange because they have issued publicly traded debt bonds, or because they intend to be publicly traded at some point. Data for 18 non-financial firms of this type was obtained directly from the Buenos Aires Stock Exchange. Finally, companies that are publicly held but not publicly traded and that incorporated in the city of Buenos Aires have to present their annual balances to the General Inspection of Justice (although the enforcement of this rule is somewhat loose). We requested to this public office the financial information for the top 100 firms (according to the 2001 ranking of sales of the specialized magazine *Mercado*) not covered by the other sources of information described above. Data for a total of 57 non-financial non-publicly traded companies (with at least four observations from contiguous years since 1995) was obtained through this procedure.

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15 A total of 17 privatized companies in the Electricity, Gas, Oil, Telecommunications, Steel, Highways and Railways sectors that are publicly traded are included in the first set of companies described above.
16 The privatization process and the database of privatized companies (which was expanded for this study) are described in detail in Galiani et al. (2002).

Our database comprises a total of 202 firms. Table 1a summarizes the number of companies and observations available for each year. The panel gets thinner for the first years because of data unavailability and because some companies were privatized after 1993. It is also thinner for 2001 because of companies' delays during the 2002 crisis in providing their data. The Appendix Table 1 presents the list of firms included in our study and the years for which data are available for each company.

We classify the companies in our sample according to their main sector of economic activity (at CIIU-2 digit level). The 202 companies participate in 33 sectors. We then classify these sectors as tradable or non-tradable according to their production composition. We perform this classification at the sector level using information from the Argentine national accounts, because company data do not disaggregate between domestic and external sales. In the top panel of Table 1b, a firm is classified as tradable if the expo share (the 1993-2001 average of the ratio of exports over total added value) of its sector of activity is larger than the median of the sector export shares across all the companies in our sample. This procedure divides our sample in a tradable half and a non-tradable half. In the second panel of Table 1b, we also classify our firms as tradable when they belong to the agriculture, mining or manufacturing sector, and as non-tradable for the other sectors.

III. Hypotheses

Capital Structure

In convertible Argentina, dollar and peso debt only differed in that the former has higher risk and lower financing costs than the latter. A key question regarding the impact of financial dollarization is, then, which of these countervailing aspects dominated. More precisely, in the absence of (implicit or explicit) exchange rate guarantees, we should expect:

> *H1: Absent (explicit or implicit) exchange rate guarantees, debt currency composition should be correlated with real exchange rate exposure* ➔ *Firms in sectors with a larger tradable component should display a larger dollar debt share.*

Moreover, it was widely believed (as witness the presence of a persistent and highly volatile currency premium) that there was a positive probability of abandoning the currency board, which, in the absence of exchange rate guarantees, should have deterred non-tradable producers from dollarizing their funding sources. Thus, again in the absence of guarantees, an increase in devaluation expectations, as reflected in larger currency premiums, should have raised the risk associated with exchange rate exposure and moved (partially) unhedged (i.e., currency mismatched) debtors to reduce it. In this regard, we test the following:

H1a: Absent (explicit or implicit) exchange rate guarantees, devaluation expectations should lead firms to reduce their real exchange induce exposure ➔ *The (positive) relationship between loan dollarization and the tradable component of the production mix of the debtor strengthens as devaluation expectations increase.*

Finally, in the particular case of Argentina, there is an additional aspect that may have played a role in the currency composition of debt, namely, the fact that most privatized companies in regulated sectors were legally endowed an explicit exchange rate guarantee through indexation of their rates to the U.S.'s CPI. While the preservation of dollar indexation in the event of a sizeable devaluation may have been an unrealistic assumption, it could be argued that companies with dollarized prices should have mirror more closely the behavior of tradable producers. To check this in the data, we test whether H1 and H1a cease to hold for companies with dollar-indexed prices.

Real exchange rate adjustment and debt deflation

As noted, in the presence of (limited) nominal flexibility under a peg, an adverse external shock should have induced an accommodating relative price adjustment that hit non-tradable producers more than tradable producers. This is, in essence, the mechanism through which debt deflation materializes in practice. Accordingly, we expect that the real exchange rate misalignment that resulted from the successive adverse shocks that characterized the Argentine economy during the late 1990s should have reflected in a deterioration of the relative performance of non-tradable producers. In particular, we expect the RER adjustment to show in both relative price deflation

and a fall in demand (sales), affecting the firm's returns and, through this channel, the investment performance. This prior leads to the following:

> *H2: The impact of an RER adjustment through debt deflation on firm performance is positively correlated with the non-tradable component of the production mix of the debtor.*

On the other hand, one could argue that, due to the presence of a persistent "peso problem," dollar debtors indeed benefited in good times from (sometimes substantially) lower financing costs, which eventually showed in a better performance and, through this channel, additional internal funds to finance new investment.17 Thus, once debt deflation is controlled for, a higher dollar debt ratio may be found to be positively (rather than negatively as conventional wisdom would indicate) correlated with firm's returns and investment. In line with this, we test the following:

> *H2a: In the absence of a nominal devaluation, debt dollarization is **positively** correlated with performance.*

Firms' expectations and anticipated debt deflation

As noted, many of the existing studies on balance sheet effects assume that investment reacts ex-post to changes in the exchange rate. While this is true under a flexible regime where the exchange rates supposedly reflect all the information currently available, under a peg expectations of a devaluation may precede actual changes in the nominal exchange rate, thus inducing a reaction in investments plans well in advance. Indeed, even if the negative expectations do not materialize, lack of confidence could induce firms to react, cutting investment plans preemptively.18 In either case, the probability of a devaluation (rather than shocks in fundamentals or even relative price adjustments) should be the key control variable. 19

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17 By good times we refer to the years in which devaluation expectations were not confirmed by real fundamentals and deflation was not already at play.

18 Note that one can go a step further and speculate that this reaction, by amplifying an ongoing recession, may feed back into devaluation expectations making the collapse of the peg ultimately inevitable. Again, a story along these lines has been proposed for Argentina. See De la Torre et al. (2002b) for a discussion.

19 At this point, it is important to note that financially dollarized producers of tradables (as opposed to *traded* goods and services) are also imperfectly hedged, as sudden devaluations usually lead to a gradual adjustment of domestically produced tradables to their international prices, both because of restrictions to redirect their output to

H3: Investment was negatively correlated with devaluation expectations, the more so the higher the firms' real exchange rate exposure.

IV. Methodological Considerations

Generically, we adopt a dynamic specification for our empirical models and postulate dynamic two-way fixed effects error component models of the following general form:

$$y_{it} = \varphi y_{it-1} - \beta(\mathrm{L})\, x_{it} + \lambda_t + \mu_i + \varepsilon_{it} \qquad (1)$$

where x_{it} is a vector of covariates that varies both across firms and time (possible including interaction terms between aggregate and firm level variables), and where $\beta(\mathrm{L})$ is a lag-polynomial of order L. We model the error components of the model, μ and λ, as fixed effects. Thus, the model allows the mean level of firm performance to be time-variant without imposing any common structure to its changes. We allow the firm performance mean to change smoothly due to smooth changes in the firms covariates and we also allow the level of the series to be affected by common year effects.

Our empirical model presents some problems of inference. Even if the errors in equation (1) are independent and identically distributed (typically not the case), this model cannot be consistently estimated by the method of dummy-variables least squares for panels of short time dimension. This semi-inconsistency is due to the asymptotic correlation that exists between the transformed lagged dependent variable and the transformed error term.

Arellano and Bond (1991; AB) propose an efficient (among its class) linear estimator that is consistent even for short time dimension panels. To estimate the parameters in dynamic panel data models, they suggest to first difference the regression function to eliminate the individual specific effects, and estimate the parameters of the model by a Generalized Method of Moments

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foreign markets and to the presence of a non-tradable component (e.g., distribution costs). See Burstein et al. (2002) for an empirical exploration of the latter.

(GMM) estimator using appropriately lagged endogenous and predetermined variables as instruments in the transformed equations.

Note, nonetheless, that after differencing, y_{it-1} is correlated with the differenced equation error, $\Delta\varepsilon_{it}$. Additionally, x_{it} may be endogenous in the sense that x_{it} is correlated with ε_{it} and earlier shocks, but uncorrelated with subsequent shocks. However, as long as ε_{it} is serially uncorrelated, all lags of y and x beyond t-1 are valid instrument for the differenced equation in period t. Consequently, a consistent estimator of the parameters of interest is obtained by using appropriately lagged variables as instruments.

The consistency of the GMM estimator proposed by Arellano and Bond (1991) depends crucially on the absence of serial correlation in ε_{it}. If the disturbance ε_{it} is not serially correlated, there should be evidence of significant negative first order serial correlation in the differenced residuals, but there should not be any evidence of second order serial correlation in the differenced residuals. Arellano and Bond (1991) develop tests for first and second order correlation in the differenced residuals. These tests are asymptotically standard normal distributed under the null hypothesis of no serial correlation. More generally, Arellano and Bond (1991) propose to rely on Sargan tests of overidentifying restrictions to evaluate the specification of the model. The Sargan test is asymptotically distributed Chi-squared under the null hypothesis of no correlation among the instruments and the residuals of the transformed model. The degrees of freedom of the distribution of the Sargan test are given by the number of overidentifying restrictions imposed in the estimation of the model.

However, Blundell and Bond (1998; BB) show that for persistent series, weak instruments cause large finite-sample biases when using the first-differenced GMM procedure to estimate autoregressive models in panels of short time dimension. They show that incorporating more informative moment conditions that are valid under quite reasonable stationarity restrictions on the initial conditions process could dramatically reduce these biases. Essentially, this results in the use of lagged first-differences as instruments for equations in levels, *in addition* to the usual lagged levels as instruments for equations in first-differences proposed in Arellano and Bond (1991).

In what follows we use both AB and BB methodologies comparatively, to test the robustness of our estimates (in both cases, we report Sargan, and A(1) and A(2) tests). In addition, whenever the necessary test are not satisfied, we compute *corrected* 2-step standard errors using Windmeijer (2000) finite sample correction.20

V. Empirical results

Real exchange rate exposure and debt deflation

Key to our analysis is the definition and measurement of the real exchange rate exposure that is the subject of this paper. In a general way, it should tell us how the firm's value changes in the event of a devaluation. However, this definition combines stock and flow effects that are crucial in the estimation of value. Regarding stocks, it depends heavily on the liabilities side of the balance sheet, given that domestic firms typically hold non-tradable physical assets. However, it is in the flow dimension (related with the Income Statement) where the debt deflation effect is more deleterious, as dollarized firms with income only marginally correlated with the nominal exchange rate or, more generally, with income sensitive to fluctuations in the real exchange rate, are more likely to face a financial constraint that severely limits its operating eventually and may precipitate bankruptcy.21

On the flow dimension, the real exchange rate exposure has to take into account not only the currency composition of debt (which determines the peso value of their financing expenses) but also the composition of its production mix. In light of this, we understood the real exchange rate exposure of a firm under a peg as the sensitivity of net income to changes in the real exchange rate.

Given the available data, we measure this exposure operationally combining debt composition and export orientation (under the realistic assumption that the dollar price of tradables is less sensitive to changes in the real exchange rate, including through variations in the nominal rate). The former is computed at firm level as the dollar-to-total debt (*Dollar Ratio*). For

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20 The standard 2-step procedure would yield biased estimators for a small sample, as in our case.
21 As noted before, firms with tradable (but not traded) output may also suffer from imperfect dollar indexation, as domestic prices of tradables adjust to international ones only gradually.

the latter, we compute the export content (measured as the export-to-value added ratio, or *Expo*) for the 19 sectors comprised in our database (at CIIU-2 digit level), and assign firms to these sectors according to their production mix.22 Thus, a firm will have a larger RER exposure the larger the dollar share of its debt, and the smaller the export component of its predominant sector. We also compute and use import content (*Impo*) in the same way. However, this variable should be treated with caution. On the one hand, it could be misleading as most of the firm's inputs, typically, do not belong to the specific sector in which the firm operates. On the other hand, a high import-content ratio could be signaling domestically-oriented import-competing sectors, which while hit by the relative price adjustment that follows a devaluation (a factor already controlled for by the export share), are nonetheless likely to benefit from lower, more expensive imports.

Debt deflation, in turn, is measured in two, indirect, ways. First, we follow the evolution of the real effective exchange rate (*REER*) during the period, as a proxy for exchange rate misalignments that are corrected over time through relative price adjustments. According to this measure, a fall in the *REER* would be associated with the presence of debt deflation. Second, we use *Deflator*, computed as the price index of the sector normalized by the GDP deflator, to measure relative price movements across sectors with different degrees of tradability. Thus, a fall in this variable (alternatively, a negative change in the ratio between the sector and the aggregate price deflators) would be associated with an adverse relative price adjustment. This allows us not only to follow actual relative price changes but also to observe the extent to which adverse real exchange rate shocks are accommodated through nominal deflation. More precisely, it allows us to test the crucial assumption that, in the event of a negative real shock, less tradable sectors are hit by a decline in relative prices.

Finally, devaluation expectations are proxied by the peso-dollar interest rate spread (from interbank lending rates).23 We also use *REER* (a signal of impending relative price adjustments) as an alternative. As noted, devaluation expectations are key to explain a differential response as a function of debt currency composition in a context in which an exchange rate devaluation did not materialize in practice.

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22 As explained above, the disaggregation at the sector level is chosen so that we can match each of these sectors with an available price index, in order to measure relative price movements.
23 Similar results are obtained using the deposit rate, highly correlated, albeit less sensitive, that its interbank counterpart.

First look at the data

Table 2a reports the summary statistics for all the observations of our sample for selected variables of interest splitting the sample between tradable and non-tradable companies.24 A main finding is noteworthy and anticipatory of the results obtained in the empirical section. It appears to be no correlation between the tradable nature of firms' output and the currency composition of their debt. Tradable and non-tradable companies show very similar debt and dollar-debt ratios. If anything, non-tradable firms display a slightly higher level of debt dollarization. This contrasts with what one would expect in the absence of exchange rate guarantees and given the deflationary period of the late 1990s. On the other hand, the table reveals that tradable producers were favored the relative price changes over the period. Dividing tradable and non-tradable producers according to whether the sector's export content is above or below the sample mean, we find that on average prices followed the GDP deflator very closely while for the former, while they displayed decline of around 10% for the latter. This is further confirmed by Figure 1, which show that whereas the simple correlation between the dollar debt ratio and the export content is all but non-existent, export-oriented sectors indeed displayed larger deflators (alternatively, were benefited by relative price changes over the period).

There is also little difference concerning the other variables. Companies in both sectors seem to have, in average, similar size according to assets. The evolution of sales over assets was similar across sectors. During the period of analysis, non-tradable companies show larger investment and earnings. By construction, the export (and import) shares of the firms classified as tradable producers are obviously larger than for the non-tradables. Table 2b presents the same data in more detail, ordering sectors according to their export content. Again, no apparent pattern appears relating tradable content of the production mix and dollar debt ratios.

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24 Variable definitions and sources are reported in the Appendix.

Econometric specification

<u>Capital structure</u>

Based on our baseline specification (1), the test of H1, which takes as dependent variable the dollar-to-total-debt ratio (Dollar Ratio), includes, as covariates, the following general controls:

      i.   Leverage ratio

      ii.   Log assets

      iii.   Year effects

      iv.   Firm effects

In addition, we use the sector export share measures (*Expo*) to control for export orientation.25 Both dynamic and cross-section results are reported. While the former would indicate how currency debt composition varies with changes in export content, this changes are likely to be small during the sample period. In particular, they display smaller variability over time than they do across firms. Thus, we expect any correlation between production mix and debt composition to be more visible using a cross section approach.

As noted, both *CRISK* and *REER* and are used to control for devaluation expectations. We expect non-export oriented firms to de-dollarize their liabilities as these expectations worsen. Hence, we interact the expectations controls with the export share to test whether the sensitivity of debt composition (if there is any) is correlated with the non-tradable content of the firms' output mix.

<u>Debt deflation</u>

To test for the impact of debt deflation on firm behavior we use two performance measures: the sales-to-assets ratio (*Sales*) and the earning-to-asset ratio (*Earnings*), adding to the general controls already mentioned (i to iv above) the dollar-to-total-debt ratio.26

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25 We also include the lagged export share for robustness. Import shares (*Impo*) , also tested, did not yield significant results and were omitted for brevity. This, as well as other unreported tests are available on request from the authors.

26 Assets and the leverage and dollar ratios are end-of period variables and are thus lagged in the regressions.

In addition, we use the *Expo*, *REER* and the devaluation expectations proxy, and their interaction.27 Finally, we include the sector deflators (Deflator) to tests the incidence of expectations, which may be traced to the incremental effect of currency risk on investment once relative price measures are controlled for.

We expect a negative real shock to affect non-tradable producers both through quantities and prices. Thus, when *Sales* and, after controlling for the latter, *Earnings* are our dependent variables, we expect that the coefficient of the interaction of *REER* with *Expo* to be positive. In both cases, we also include *Deflator* to control for the incidence of relative price variations on earnings. Here, we expect the coefficient to be negative.

Note also that H2a above would imply that, once other measures of price deflation are included, the coefficient corresponding to the dollar debt ratio would be positive in the performance regressions. Indeed, if investment reacts *a posteriori* to performance (for example, due to the access to internal funds of financially constrained firms), investment may also respond positively to dollar ratios in good times, given that dollar debt was, ex-post, less costly for Argentinean firms before the currency collapsed. We include *Dollar Ratio* (lagged) in the earnings regression to test this in the data.

Finally, we run regressions of investment in physical capital (*Investment*) on the previous set of controls, including both sales and earnings in the preceding period (we expect these coefficients to have a positive sign reflecting the incidence of the availability of internal funds).

Empirical results

Tables 3-7 report the preliminary results. Table 3 focuses on debt composition, testing hypotheses H1 and H1a. Tables 4-6 test the impact of real shocks on sales, earnings and investment in physical capital, as a function of the firms' export content and the evolution of the relative price of the sector. Finally, Table 7 explores the impact of devaluation expectations on investment.

Results in Table 3 consistently show that the dollarization of corporate debt in convertible Argentina did not exhibit any relation with the tradable nature of the firm, or the impending price adjustment as the REER fell over the last part of the decade. Table 3a shows a simple cross section estimation of our baseline specification (including leverage ratio, firms size measured by assets and export orientation) using firm averages over the sample period (between group estimates). The results reveal a consistent significant link between the debt dollar ratio and size and indebtness that will reappear in the dynamic specifications. On the contrary, export orientation is negatively, albeit not significantly, related with debt dollarization, contradicting H1 (column 2). As noted, many non-tradable producers were benefited by an explicit exchange rate guarantee in the form of dollar indexation of their rates. However, controlling for the presence of dollarized producers of services does not alter the results. Indeed, the coefficient for dollarized prices, while positive as expected, is not significant (column 3).28

Table 3b replicates these exercises from a dynamic perspective. Here, as well as in the rest of the tables, we start by reporting several estimation procedures of our baseline specification to verify the consistency of the results. Thus, results estimated by OLS, within group (LSDV), Arellano and Bond (AB), Blundell and Bond (BB) are presented in columns 1 to 5 (column 4 replicates AB instrumenting also the control variables by their first differences). Coefficients differ as expected, with OLS closer to our cross-section estimates, and the coefficient of the lagged dependent variable estimated by AB and BB lying between LSDV and OLS. The evidence of a sizeable downward bias of LSDV with respect to AB and BB justifies the use of GMM methods. In addition, there is not much difference between any of those estimators (i.e., between, AB and BB).

Overall, however, while the findings indicate that dollar ratios increase with leverage and size (possibly reflecting a limited supply of peso funding), the evidence of a correlation between export orientation and debt dollarization is, at best, weak. The coefficient is positive in most of the specifications but barely significant only when estimated using fixed effects. In fact, once the model is consistently identified, by means of a GMM method, the sign of the *Expo* coefficient

27 For robustness, we also tested the interaction with the average export share.
28 Running column 2 excluding firms with dollarized prices yields a not significant *Expo* coefficient.

falls strongly suggesting the rejection of H1. The smaller coefficients that are obtained for lagged values of *Expo* in columns 6 and 7 further support this conclusion.

Table 3c adds to the baseline specification variables associated with currency risk.29 Given the previous findings, there is reason to expect that firms held, on average, unhedged (and, in light of the high degree of financial dollarization in Argentina over the period, short) exchange rate positions. Then, one could expect that firms would move to undo this positions by de-dollarizing their debt as currency risk mounted. However, REER and CRISK, both signals of a potential RER correction, are not significant determinants of the evolution of debt dollarization.30 It could be argued that these specification biases our results towards lack of significance by bunching hedged exporters (for which currency risk should have been neutral) with unhedged non-tradable producers. Hence, we test in Table 3d whether the correlation between devaluation expectations and dollarization is stronger for the latter, interacting REER and CRISK with export orientation. Coefficients are positive as expected (with dollarization falling in relative terms with currency risk for firms with lower export orientation) but barely significant in only one case.31

In sum, both H1 and H1a are consistently rejected by the data. Debt dollarization appears to have been a widespread phenomenon that did not respond to export orientation (or, for that matter, price indexation), nor was the result of positive devaluation expectation, as is attested by the lack of sensitivity, both in general and for real exchange rate-exposed firms in particular, to currency risk (which varied dramatically and reached high peaks over the period). At any rate, these findings only confirm the intuition provided by our first glance at the data, which revealed very high levels of debt dollarization across sectors.

Tables 4-6 address the link between debt deflation and firm performance. As noted, in Table 4a we run regressions of the sales-to-asset ratio on the relative price deflator, controlling for leverage and size, as well as the firm's export orientation. As before, OLS, LSDV, AB and BB estimations are reported. Again, results again conform to theory and suggest the use of AB.

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29 In order to do this, we drop the year effects. Additionally, this allows us to test the incidence of the latter in the specification, which turned out to be only minor, with the joint significance rejected at conventional levels.
30 For conciseness, and given the comparability of results, in the table we report AB estimates. Results using LSDV and BB are available on request.
31 Note that we cannot directly test whether higher currency risk actually led to smaller dollarization ratios for non-tradable producers, as the correlation between currency risk and dollar ratios is subsumed in the year effects.

The deflator displays, as expected, a positive sign (with favorable relative price changes increasing income), and is significant in most regressions. Thus, this finding combined with the fact that the evolution of relative prices during the period of analysis affected non-export oriented firms more negatively (Table 2 and Figure 2), provides support to the view that a deflationary adjustment to a more depreciated real exchange rate tends to burden primarily non-tradable producers.

Deflation, in turn, affects firm earnings through a decline in income, as shown in the earnings regressions of Table 5. The deflator coefficient, positive and significant when introduced alone (column 3), loses explanatory power once sales are controlled for (column 5). No direct effect from real exchange rate changes is detected beyond their impact on relative prices as reflected in the sector deflator. The dollar debt ratio allows us to test H2b, namely, that a high dollar debt ratio in the preceding period, while ex-ante a one-sided bet for non-tradable producers exposed to RER changes, was a profitable one as long as a nominal devaluation did not materialize. Thus, debt dollarization may have fostered, rather than deterred, firm performance through lower realized financing costs. The findings in the Table are consistent with this view. Larger dollar debt ratios are positively and significantly correlated with earnings in most specifications.

Table 6 moves on to test how the previous results impacted on investment. While results indicator that deflation did have an effect on investment performance through its effect on earnings, other controls do not have additional significant incidence. Our baseline specification controls for profits, which as expected, displays a positive and, in some regressions, significant coefficient. On the other hand, sales, deflator or the dollar ratio either fail to be significant or display the wrong sign. Again, the evolution of the real exchange rate does not exhibit any differential effect across sectors with varying export orientations.

Finally, Table 7 addresses hypothesis H3 about the effect of devaluation expectations on investment behavior, under which an increase in the perceived probability of a nominal devaluation should be reflected in a contraction of investment that is negatively correlated with the export content of the firm, so that the interaction between de expectations variable and export content should be negative. In line with findings in the previous tables, the data rejects H3.

VI. Concluding remarks

Using the specific case of Argentina, this paper helps illuminate the implications of a pegged exchange rate regime in two different dimensions, namely, the relation between a peg and the capital structure of the firm, and the distribution of the adjustment to real shocks while the peg is in place. On the former, we found that debt dollarization was the rule rather than the exception, and it born no relationship to the firm's production mix or the ever-changing probability of a sudden nominal devaluation. While the actual presence of an implicit guarantee such as the one discussed in the introduction cannot be directly tested in the data, the results reported here are broadly consistent to the conventional view that non-tradable producers disregarded real exchange rate exposures even during periods of sizable currency risk.

Two comments are in order concerning the previous point. First, we are ignoring the behavior of the supply side of the credit market. In particular, there is some anecdotal evidence that, in Argentina, access to peso funding was limited, the more so the higher the currency risk. However, while this could explain the resilience of dollarization ratios to changes in expectations, it does not detract from the fact that a simple cross section shows a *negative*, albeit not significant, correlation between these ratios and export orientation that is not driven by exchange rate-protected privatized companies.

The impact of debt deflation, while weaker, is still visible in the data. Relative price changes, which, due to the protracted deflation that characterized the period under analysis, favored export-oriented firms, had the expected impact on sales and earnings and, through the latter, on investment. Moreover, there is some evidence that dollarized firms benefited from lower financing costs during the convertibility period. This finding is not trivial, as financial

costs (combined with a wrong incentive design) appear to have been an important contributing

factor for the reluctance of financial officers to hedge their exposures.32

Finally, and in line with the result on the currency choice, increases in devaluation

expectations did not elicit any differential response from investment from those firms more

exposed to real exchange rate risk, either through a large debt dollarization ratio or through a

limited export orientation.

In sum, the core results of the paper seem in line with two criticisms that the Argentine

currency board received in recent years. First, that by fueling beliefs in an implicit guarantee it

stimulated dollarization across the board. Second, that while it can postpone the real exchange

adjustment over time, it cannot completely isolate the economy from real shocks: the feared

balance sheet effects are replaced in this case by less dramatic but equally deleterious debt

deflation effects.

Unfortunately, the discussion on balance sheet vs. debt deflation effects is unlikely to be

settled based on the Argentine case. On the one hand, the full impact of debt deflation cannot be

assessed empirically because the devaluation interrupted what otherwise would have been a

much longer contractionary process. On the other, after the devaluation, the balance sheet effect

materialized only to a very limited extent, as all domestic liabilities were compulsorily converted

to pesos at the exchange rate prevailing under the currency board.33 This notwithstanding, the

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32 CFOs are typically evaluated based on annual results without weighting in risk considerations, inducing financial officers to behave as return-maximizers speculators rather than risk-minimizing hedgers. In this context, the unwillingness to pay the recurrent cost of a large peso premium may have underscored the build up of currency imbalance at the firm level (Tappatá et al., 2000). The fact that dollar debtors reaped the benefits of this one-sided bet should have certainly reinforced this speculative bias.

33 External corporate debt is still in dollars. Again, the impact is here muted as well, since most this debt is on default or in the process of renegotiation under the umbrella of sovereign default and extensive controls to capital

evidence presented here supports the concerns about the externalities associated with financial

dollarization and the need to address the issue from a prudential perspective. Needless to say, the

implication of any prudential norm requires an analysis of the supply side of the credit market,

which would be the natural complement of the research done in this paper.

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transfers. At the time of this writing, a partial exchange rate guarantee on corporate external debt has not been ruled out.

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Table 1a. Data Structure

Firms	Number of companies	Number of observations									
		1993	1994	1995	1996	1997	1998	1999	2000	2001	TOTAL
Always Private											
Publicly Traded	54	45	50	53	54	54	54	54	54	49	467
Non-Publicly Traded	75	46	55	61	66	68	75	75	75	67	588
	129	91	105	114	120	122	129	129	129	116	1055
Privatized											
Publicly Traded	17	11	13	15	16	17	17	17	17	17	140
Non-Publicly Traded	56	20	28	35	40	54	56	56	55	53	397
	73	31	41	50	56	71	73	73	72	70	537
TOTAL	**202**	**122**	**146**	**164**	**176**	**193**	**202**	**202**	**201**	**186**	**1592**

Table 1b. Tradable and Non-Tradable Companies

Firms	Number of companies	Number of observations									
		1993	1994	1995	1996	1997	1998	1999	2000	2001	TOTAL
Tradable[1]	104	78	89	93	98	98	104	104	104	96	864
Non-tradable[1]	98	44	57	71	78	95	98	98	97	90	728
TOTAL	202	122	146	164	176	193	202	202	201	186	1592

1. A firm is classified as tradable if the expo share (1993-2001 average of the ratio of exports over total added value) of its sector of activity is larger than the median of the sector export shares across all the companies in our sample.

Firms	Number of companies	Number of observations									
		1993	1994	1995	1996	1997	1998	1999	2000	2001	TOTAL
Tradable[2]	105	79	90	94	99	99	105	105	105	97	873
Non-tradable[2]	97	43	56	70	77	94	97	97	96	89	719
TOTAL	202	122	146	164	176	193	202	202	201	186	1592

2. A firm is classified as tradable if it belongs to the agriculture, mining or manufacturing sector.

Table 2a. Summary Statistics

Tradables (104 Companies)[1]					
Variable	**Obs**	**Mean**	**Std. Dev.**	**Min**	**Max**
Total Debt*	864	50.5%	26.1%	1.9%	264.7%
Dollar Debt**	864	55.1%	28.3%	0.0%	96.4%
Log Assets	864	18.84	1.51	14.56	23.27
Investment in Physical Capital*	864	4.0%	7.6%	-80.4%	64.3%
Purchases of Physical Capital*	843	5.3%	6.5%	0.0%	67.9%
Sales*	864	88.9%	73.3%	0.2%	873.3%
Earnings*	864	9.3%	14.3%	-68.2%	132.8%
Expo Share	864	42.7%	30.7%	0.3%	213.8%
Impo Share	864	115.0%	394.1%	0.7%	3430.3%
Deflator (interperiod variation)	104	-0.9%	17.0%	-48.6%	31.0%

Non-Tradables (98 companies)[1]					
Variable	**Obs**	**Mean**	**Std. Dev.**	**Min**	**Max**
Total Debt*	728	50.7%	23.0%	2.4%	129.7%
Dollar Debt**	728	57.9%	30.8%	0.0%	99.6%
Log Assets	728	18.99	1.49	15.64	22.63
Investment in Physical Capital*	728	8.0%	12.1%	-39.5%	95.6%
Purchases of Physical Capital*	721	8.8%	12.0%	0.0%	95.6%
Sales*	728	85.9%	111.3%	0.0%	1032.5%
Earnings*	728	15.7%	22.3%	-93.6%	207.3%
Expo Share	728	0.5%	1.1%	0.0%	8.1%
Impo Share	728	1.6%	2.1%	0.0%	12.8%
Deflator (interperiod variation)	98	-10.8%	17.8%	-28.4%	38.1%

Notes:

* Ratios over total assets

** Ratios over total debt

1. A firm is classified as tradable if the expo share (1993-2001 average of the ratio of exports over total added value) of its sector of activity is larger than the median of the sector export shares across all the companies in our sample.

Table 2b. Summary Statistics by Sector of Economic Activity

Firms	CIIU	Sector Description	Total Debt*	Dollar Debt**	Log Assets	Investment in Physical Capital*	Purchases of Physical capital*	Sales*	Earnings*	Expo Share[1]	Impo Share[2]	Deflator (interperiod variation)[3]
		Tradable Sectors										
2	30	Computer Equipments	82.7%	89.4%	18.7	11.4%	2649.0%	102.7%	9.4%	129.9%	16.6%	-48.6%
8	34	Automobile	68.6%	59.9%	19.7	5.6%	135.9%	113.5%	6.3%	83.1%	6.0%	-7.8%
2	19	Leather	62.0%	60.3%	18.8	-2.4%	19.6%	56.6%	6.0%	76.2%	2.4%	0.7%
21	15	Food and Beverage	50.3%	50.2%	19.1	5.0%	8.9%	104.9%	12.7%	68.4%	6.2%	-0.4%
3	27	Metals	40.3%	63.1%	20.3	4.2%	55.7%	66.4%	9.1%	64.7%	4.5%	-7.8%
2	16	Tobacco	44.1%	12.7%	19.5	4.4%	6.4%	104.8%	22.5%	49.0%	5.9%	6.5%
9	11	Oil and Gas	54.5%	71.4%	20.6	7.8%	3.6%	40.4%	15.1%	38.6%	9.8%	31.0%
8	1	Agriculture and Livestock	66.3%	73.5%	18.6	2.7%	3.6%	158.0%	7.8%	30.5%	3.7%	-22.4%
17	24	Chemicals	51.9%	49.8%	18.4	3.1%	76.7%	110.1%	10.6%	28.5%	4.2%	12.2%
1	31	Electrical Equipments	21.5%	27.2%	15.1	0.4%	177.9%	75.0%	4.6%	28.0%	0.4%	-19.9%
2	17	Textile	31.6%	64.5%	17.1	4.7%	34.5%	61.1%	7.0%	24.9%	6.1%	-11.7%
6	29	Other Machinery	31.7%	30.0%	16.7	-0.1%	157.5%	50.4%	0.0%	24.3%	1.5%	-5.1%
8	21	Paper	35.9%	38.3%	18.9	2.1%	59.0%	41.9%	5.7%	18.1%	2.7%	2.4%
1	2	Wood Extraction	22.2%	55.5%	17.3	-3.8%	2.3%	18.1%	-1.1%	15.7%	1.3%	-16.9%
3	32	Radio and Television Equipments	81.5%	79.1%	17.4	6.1%	428.4%	112.6%	2.8%	15.6%	7.7%	-48.6%
3	25	Rubber, Plastics	47.0%	69.3%	18.1	6.1%	36.3%	88.0%	10.5%	10.7%	7.3%	14.0%
2	28	Metal Products	30.1%	63.9%	21.1	3.5%	39.4%	53.6%	9.8%	8.3%	4.0%	-0.9%
6	26	Mineral non metallic	34.7%	56.7%	18.8	4.5%	22.5%	48.5%	8.4%	8.3%	5.0%	-8.1%
		Non-Tradable Sectors										
1	20	Wood products	37.4%	58.0%	17.9	3.7%	11.2%	48.2%	8.7%	4.9%	6.9%	-9.1%
47	40	Gas, Electricity, Steam and Water supply	37.6%	66.2%	19.2	6.8%	2.7%	41.3%	10.6%	0.8%	7.3%	-21.6%
2	92	Sporting and Cultural Activities	60.3%	64.3%	18.3	6.9%	0.1%	64.1%	14.7%	0.2%	7.0%	-20.3%
1	41	Water Distribution	70.1%	75.8%	20.6	23.8%	0%	49.2%	18.5%	0%	23.9%	24.2%
5	45	Construction	49.8%	43.6%	18.0	2.7%	0%	65.9%	8.7%	0%	3.7%	-9.8%
2	50	Car sale, manteinance and reparation	45.9%	72.5%	20.9	6.6%	0%	91.2%	9.9%	0%	8.5%	-8.6%
3	51	Wholesale	61.9%	43.0%	17.9	3.4%	0%	307.2%	9.2%	0%	4.1%	-2.9%
7	52	Retailing	62.0%	42.9%	19.1	16.0%	0%	179.7%	7.3%	0%	17.8%	-3.5%
11	60	Road Transport	71.4%	36.3%	17.6	10.5%	0%	117.1%	55.6%	0%	11.3%	20.3%
2	62	Air Transport	87.4%	70.2%	19.2	16.0%	0%	113.0%	2.3%	0%	21.9%	34.0%
2	63	Travel Agency	70.1%	61.6%	20.1	8.2%	0%	27.8%	6.4%	0%	8.2%	38.1%
10	64	Post Offices and Telecommunications	59.0%	66.1%	20.5	8.1%	0%	60.2%	14.9%	0%	8.8%	-28.4%
1	65	Real Estate and Financial Services	25.7%	91.2%	19.7	0.5%	0%	12.3%	3.3%	0%	0.7%	-15.1%
1	70	Real Estate	45.1%	80.5%	19.1	13.5%	0%	7.1%	3.9%	0%	13.6%	7.5%
3	85	Health and Social Services	75.9%	17.2%	17.4	2.1%	0%	429.8%	3.6%	0%	2.6%	2.1%

Notes:
* Ratios over total assets
** Ratios over total debt
1 Ratio exports/value added for each sector
2 Ratio imports/value added for each sector
3 Variation over 1993-2001.

Table 3a. Dependent Variable: Dollar Ratio (cross section)

Explanatory Variables	Coefficients (Std. Errors) (1)	Coefficients (Std. Errors) (2)	Coefficients (Std. Errors) (3)
Leverage Ratio	0.273 *** (0.076)	0.288 *** (0.077)	0.293 *** (0.078)
Log Assets	0.081 *** (0.011)	0.082 *** (0.011)	0.081 *** (0.011)
Expo		-0.072 (0.055)	-0.065 (0.059)
Dollar Index			0.018 (0.049)
Number of Observations	202	202	202

Table 3b. Dependent Variable: Dollar Ratio

Explanatory Variables	OLS Coefficients (Std. Errors) (1)	LSDV Coefficients (Std. Errors) (2)	AB Coefficients (Std. Errors) (3)	AB Coefficients (Std. Errors) (4)	BB Coefficients (Std. Errors) (5)	LSDV Coefficients (Std. Errors) (6)	AB Coefficients (Std. Errors) (7)
Dollar Ratio (t −1)	0.806 *** (0.015)	0.319 *** (0.026)	0.516 *** (0.069)	0.439 *** (0.082)	0.622 *** (0.048)	0.321 *** (0.026)	0.522 *** (0.067)
Leverage Ratio (t)	0.075 *** (0.016)	0.196 *** (0.029)	0.295 *** (0.098)	0.538 ** (0.281)	0.129 *** (0.071)	0.197 *** (0.030)	0.289 *** (0.094)
Log Assets (t)	0.019 *** (0.003)	0.047 *** (0.012)	0.057 * (0.033)	0.073 *** (0.028)	0.014 (0.002)	0.045 *** (0.012)	0.0561 * (0.032)
Expo (t)	-0.002 (0.012)	0.068 * (0.038)	0.026 (0.039)	0.240 (0.178)	0.019 (0.027)	…..	…..
Expo (t −1)	…..	…..	…..	…..	…..	0.046 (0.383)	0.001 (0.042)
Year Effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Sargan Test	…..	…..	0.637	0.794	0.555	…..	0.618
AR (1)	…..	…..	0.001	0.001	0.001	…..	0.001
AR (2)	…..	…..	0.503	0.553	0.543	…..	0.507
Number of Observations	1390	1390	1188	1188	1390	1390	1188
Number of Firms	202	202	202	202	202	202	202

Notes: Asymptotic standard errors robust to general cross-section and time series heteroskedasticity are reported in parentheses. The GMM estimates are all two-step estimates. Standard errors are corrected for finite sample bias following Windmeijer (2002). For the Sargan, AR(1) and AR(2) tests, the statistic reported is the p-value. *** Statistically different from zero at the 0.01 level of significance. ** Statistically different from zero at the 0.05 level of significance. * Statistically different from zero at the 0.1 level of significance.

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Table 3c. Dependent Variable: Dollar Ratio

Explanatory Variables	AB Coefficients (Std. Errors) (1)	AB Coefficients (Std. Errors) (2)	AB Coefficients (Std. Errors) (3)
Dollar Ratio (t – 1)	0.548 *** (0.075)	0.515 *** (0.08)	0.515 *** (0.07)
Leverage Ratio (t)	0.293 *** (0.1004)	0.307 ** (0.1183)	0.292 ** (0.126)
Log Assets (t)	0.051 ** (0.026)	0.051 ** (0.028)	0.053 ** (0.028)
Expo (t)	0.031 (0.039)	0.005 (0.03)	0.003 (0.028)
Reer (t)	0.0004 (0.001)	…..	0.001 (0.002)
Crisk (t)	.....	0.002 (0.002)	0.003 (0.002)
Year Effects	No	No	No
Exclusion Restrictions Test	0.4388	0.7382	0.4023
Sargan Test	0.679	0.533	0.543
AR (1)	0.001	0.001	0.001
AR (2)	0.537	0.372	0.362
Number of Observations	1188	1066	1066
Number of Firms	202	202	202

Notes: Asymptotic standard errors robust to general cross-section and time series heteroskedasticity are reported in parentheses. The GMM estimates are all two-step estimates. Standard errors are corrected for finite sample bias following Windmeijer (2002). For the Sargan, AR(1) and AR(2) tests, the statistic reported is the p-value. *** Statistically different from zero at the 0.01 level of significance. ** Statistically different from zero at the 0.05 level of significance. * Statistically different from zero at the 0.1 level of significance.

Table 3d. Dependent Variable: Dollar Ratio

Explanatory Variables	AB Coefficients (Std. Errors) (1)	AB Coefficients (Std. Errors) (2)	AB Coefficients (Std. Errors) (3)	AB Coefficients (Std. Errors) (4)	AB Coefficients (Std. Errors) (5)	AB Coefficients (Std. Errors) (6)
Dollar Ratio (t −1)	0.515 *** (0.07)	0.518 *** (0.071)	0.491 *** (0.073)	0.491 *** (0.073)	0.513 *** (0.07)	0.485 *** (0.073)
Leverage Ratio (t)	0.3 *** (0.098)	0.298 *** (0.09)	0.298 *** (0.114)	0.298 *** (0.114)	0.301 *** (0.099)	0.297 *** (0.116)
Log Assets (t)	0.052 * (0.027)	0.048 (0.031)	0.051 * (0.03)	0.051 * (0.03)	0.052 * (0.03)	0.053 * (0.03)
Expo (t)	- 0.111 (0.31)	0.013 (0.038)	- 0.009 (0.034)	0.001 (0.029)	0.024 (0.04)	0.0025 (0.029)
Expo*Reer (t)	0.001 (0.003)	…..	…..	…..	…..	…..
Expo*AVReer	…..	0.006 * (0.003)	…..	…..	…..	…..
Expo*Crisk (t)	…..	…..	0.0048 (0.008)	…..	…..	…..
Expo*AVCrisk	…..	…..	…..	0.005 (0.011)	…..	…..
Tradable*Reer (t)	…..	…..	…..	…..	0.001 (0.002)	…..
Tradable*Crisk (t)	…..	…..	…..	…..	…..	0.003 (0.005)
Year Effects	Yes	Yes	Yes	Yes	Yes	Yes
Sargan Test	0.645	0.634	0.640	0.645	0.628	0.626
AR (1)	0.001	0.001	0.001	0.001	0.001	0.001
AR (2)	0.513	0.516	0.371	0.367	0.518	0.354
Number of Observations	1188	1188	1066	1066	1188	1066
Number of Firms	202	202	202	202	202	202

Notes: Asymptotic standard errors robust to general cross-section and time series heteroskedasticity are reported in parentheses. The GMM estimates are all two-step estimates. Standard errors are corrected for finite sample bias following Windmeijer (2002). For the Sargan, AR(1) and AR(2) tests, the statistic reported is the p-value. *** Statistically different from zero at the 0.01 level of significance. ** Statistically different from zero at the 0.05 level of significance. * Statistically different from zero at the 0.1 level of significance.

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Table 4a. Dependent Variable: Sales

Explanatory Variables	OLS Coefficients (Std. Errors) (1)	LSDV Coefficients (Std. Errors) (2)	AB Coefficients (Std. Errors) (3)	AB Coefficients (Std. Errors) (4)	BB Coefficients (Std. Errors) (5)	AB Coefficients (Std. Errors) (6)
Ratio Sales (t –1)	0.842 *** (0.092)	0.448 *** (0.023)	0.625 *** (0.1671)	0.623 *** (0.1601)	0.671 *** (0.105)	0.589 *** (0.141)
Leverage Ratio (t-1)	0.113 *** (0.035)	-0.07 (0.065)	0.085 (0.061)	0.1264 * (0.071)	0.195 (0.145)	0.05 (0.065)
Log Assets (t-1)	-0.008 (0.005)	-0.041 * (0.024)	0.186 *** (0.054)	0.193 *** (0.048)	-0.088 ** (0.04)	0.167 *** (0.046)
Expo (t)	-0.00008 (0.026)	-0.052 (0.838)	-0.043 (0.089)	0.255 (1.025)	-0.003 (0.006)	-3.021 (3.341)
Deflator (t)	0.0616 (0.63)	0.031 (0.125)	0.2491 ** (0.119)	0.267 * (0.165)	0.183 (0.114)	0.301 ** (0.144)
Expo*Reer (t)	.....	.....	.....	.....	.....	0.026 (0.034)
Year Effects	Yes	Yes	Yes	Yes	Yes	Yes
Sargan Test	.....	.....	0.069	0.107	0.111	0.238
AR (1)	.....	.....	0.008	0.009	0.001	0.008
AR (2)	.....	.....	0.905	0.923	0.799	0.943
Number of Observations	1390	1390	1188	1188	1390	1390
Number of Firms	202	202	202	202	202	202

Notes: Asymptotic standard errors robust to general cross-section and time series heteroskedasticity are reported in parentheses. The GMM estimates are all two-step estimates. Standard errors are corrected for finite sample bias following Windmeijer (2002). For the Sargan, AR(1) and AR(2) tests, the statistic reported is the p-value. *** Statistically different from zero at the 0.01 level of significance. ** Statistically different from zero at the 0.05 level of significance. * Statistically different from zero at the 0.1 level of significance.

Table 5. Dependent Variable: Earnings

Explanatory Variables	OLS Coefficients (Std. Errors) (1)	LSDV Coefficients (Std. Errors) (2)	AB Coefficients (Std. Errors) (3)	BB Coefficients (Std. Errors) (4)	AB Coefficients (Std. Errors) (5)	AB Coefficients (Std. Errors) (6)
Ratio Earnings (t –1)	0.799 ***	0.412 ***	0.682 ***	0.646 ***	0.503 ***	0.501 ***
	(0.141)	(0.027)	(0.094)	(0.054)	(0.101)	(0.102)
Leverage Ratio (t-1)	0.008	-0.041 *	0.038	0.022	0.005	0.004
	(0.011)	(0.021)	(0.04)	(0.035)	(0.037)	(0.037)
Dollar Ratio (t-1)	0.0017	0.039 **	0.052 **	0.044	0.036 **	0.035 **
	(0.103)	(0.018)	(0.02)	(0.031)	(0.018)	(0.018)
Log Assets (t-1)	0.0009	-0.034 ***	0.013	-0.021 *	-0.001	-0.001
	(0.0019)	(0.007)	(0.009)	(0.012)	(0.011)	(0.011)
Expo (t)	-0.015 *	0.003	-0.047	-0.012	-0.023	-0.003
	(0.008)	(0.027)	(0.038)	(0.024)	(0.029)	(0.187)
Deflator (t)	0.023	-0.024	0.101 **	0.081	0.06	0.059
	(0.021)	(0.041)	(0.047)	(0.059)	(0.04)	(0.039)
Ratio Sales (t)	.....	.....	.....	.....	0.132 ***	0.133 ***
					(0.043)	(0.043)
Expo*Reer (t)	.....	.....	.....	.....	.....	-0.0002
						(0.002)
Year Effects	Yes	Yes	Yes	Yes	Yes	Yes
Sargan Test	.....	.....	0.217	0.683	0.225	0.209
AR (1)	.....	.....	0.001	0.001	0.003	0.003
AR (2)	.....	.....	0.605	0.628	0.143	0.141
Number of Observations	1390	1390	1188	1390	1188	1118
Number of Firms	202	202	202	202	202	202

Notes: Asymptotic standard errors robust to general cross-section and time series heteroskedasticity are reported in parentheses. The GMM estimates are all two-step estimates. Standard errors are corrected for finite sample bias following Windmeijer (2002). For the Sargan, AR(1) and AR(2) tests, the statistic reported is the p-value. *** Statistically different from zero at the 0.01 level of significance. ** Statistically different from zero at the 0.05 level of significance. * Statistically different from zero at the 0.1 level of significance.

Table 6. Dependent Variable: Investment

Explanatory Variables	OLS (1) Coefficients (Std. Errors)	LSDV (2) Coefficients (Std. Errors)	AB (3) Coefficients (Std. Errors)	BB (4) Coefficients (Std. Errors)	AB (5) Coefficients (Std. Errors)	AB (6) Coefficients (Std. Errors)
Ratio Investment (t −1)	0.336 *** (0.021)	0.053 ** (0.022)	0.132 *** (0.05)	0.202 *** (0.048)	0.133 *** (0.05)	0.135 *** (0.05)
Leverage Ratio (t-1)	0.027 *** (0.01)	0.036 ** (0.015)	0.04 (0.044)	0.043 (0.037)	0.038 (0.044)	0.039 (0.043)
Dollar Ratio (t-1)	-0.008 (0.008)	-0.02 (0.013)	-0.041 ** (0.018)	-0.023 (0.02)	-0.041 ** (0.018)	-0.042 ** (0.019)
Ratio Earnings (t-1)	0.052 *** (0.011)	0.03 (0.021)	0.014 (0.024)	0.071 ** (0.029)	0.015 (0.025)	0.016 (0.025)
Log Assets (t-1)	0.003 ** (0.001)	-0.065 *** (0.005)	-0.099 *** (0.02)	-0.0048 (0.007)	-0.1003 *** (0.023)	-0.101 *** (0.023)
Expo (t)	-0.016 ** (0.007)	-0.018 (0.019)	-0.009 (0.015)	0.003 (0.011)	-0.096 (0.1524)	-0.014 (0.014)
Deflator (t)	0.01 (0.016)	-0.018 (0.029)	-0.034 (0.05)	-0.005 (0.031)	-0.034 (0.053)	-0.034 (0.054)
Ratio Sales (t-1)	0.001 (0.002)	-0.013 ** (0.06)	-0.001 (0.01)	-0.01 (0.006)	-0.001 (0.012)	-0.002 (0.012)
Expo*Reer (t)	…..	…..	…..	…..	0.0008 (0.001)	…..
ExpoAV*Reer (t)	…..	…..	…..	…..	…..	0.002 (0.0018)
Year Effects	Yes	Yes	Yes	Yes	Yes	Yes
Sargan Test	…..	…..	0.348	1.000	0.353	0.398
AR (1)	…..	…..	0.001	0.001	0.001	0.001
AR (2)	…..	…..	0.602	0.515	0.613	0.635
Number of Observations	1390	1390	1188	1390	1188	1118
Number of Firms	202	202	202	202	202	202

Notes: Asymptotic standard errors robust to general cross-section and time series heteroskedasticity are reported in parentheses. The GMM estimates are all two-step estimates. Standard errors are corrected for finite sample bias following Windmeijer (2002). For the Sargan, AR(1) and AR(2) tests, the statistic reported is the p-value. *** Statistically different from zero at the 0.01 level of significance. ** Statistically different from zero at the 0.05 level of significance. * Statistically different from zero at the 0.1 level of significance.

Table 7. Dependent Variable: Investment

Explanatory Variables	AB Coefficients (Std. Errors) (1)	AB Coefficients (Std. Errors) (2)	AB Coefficients (Std. Errors) (3)	BB Coefficients (Std. Errors) (4)	AB Coefficients (Std. Errors) (5)	AB Coefficients (Std. Errors) (6)
Ratio Investment (t −1)	0.127 *** (0.046)	0.110 ** (0.054)	0.129 *** (0.047)	0.110 ** (0.054)	0.126 *** (0.047)	0.110 ** (0.054)
Dollar Ratio (t-1)	-0.043 ** (0.017)	-0.048 *** (0.018)	-0.043 ** (0.017)	-0.047 ** (0.018)	-0.052 (0.177)	-0.039 ** (0.019)
Log Assets (t-1)	-0.106 *** (0.02)	-0.114 *** (0.02)	-0.107 *** (0.021)	-0.114 *** (0.022)	-0.107 *** (0.020)	-0.115 *** (0.022)
Expo (t)	-0.04 (0.142)	-0.013 (0.02)	-0.016 (0.013)	-0.017 (0.016)	-0.010 (0.015)	-0.021 (0.014)
Expo*Reer (t)	0.0002 (0.001)	…..	…..	…..	…..	…..
ExpoAV*Reer (t)	…..	…..	0.0015 (0.001)	…..	…..	…..
Expo*CRisk (t)	…..	-0.002 (0.003)	…..	…..	…..	…..
ExpoAV*CRisk (t)	…..	…..	…..	-0.004 (0.004)	…..	…..
Dollar Ratio (t −1)*Reer (t)	…..	…..	…..	…..	0.0001 (0.0019)	…..
Dollar Ratio (t −1)*Crisk (t)	…..	…..	…..	…..	…..	-0.0056 (0.0035)
Year Effects	Yes	Yes	Yes	Yes	Yes	Yes
Sargan Test	0.297	0.250	0.331	0.238	0.276	0.271
AR (1)	0.001	0.001	0.001	0.001	0.001	0.001
AR (2)	0.599	0.192	0.621	0.200	0.609	0.196
Number of Observations	1118	1066	1188	1066	1188	1066
Number of Firms	202	202	202	202	202	202

Notes: Asymptotic standard errors robust to general cross-section and time series heteroskedasticity are reported in parentheses. The GMM estimates are all two-step estimates. Standard errors are corrected for finite sample bias following Windmeijer (2002). For the Sargan, AR(1) and AR(2) tests, the statistic reported is the p-value. *** Statistically different from zero at the 0.01 level of significance. ** Statistically different from zero at the 0.05 level of significance. * Statistically different from zero at the 0.1 level of significance.

Figure 1

y = 0,0608x + 0,5522
R^2 = 0,0073

y = 0,1886x + 0,0303
R^2 = 0,0609
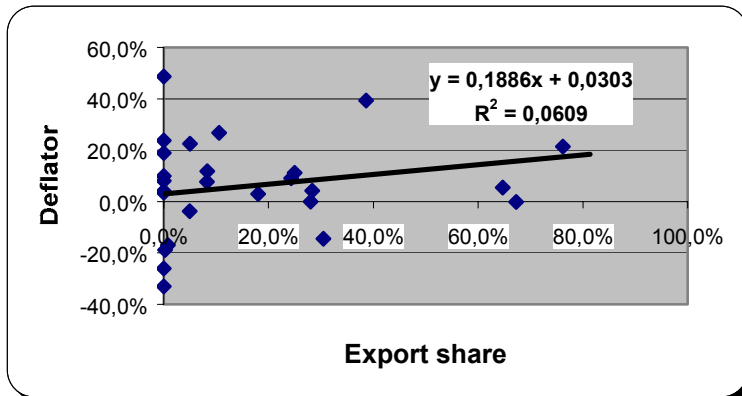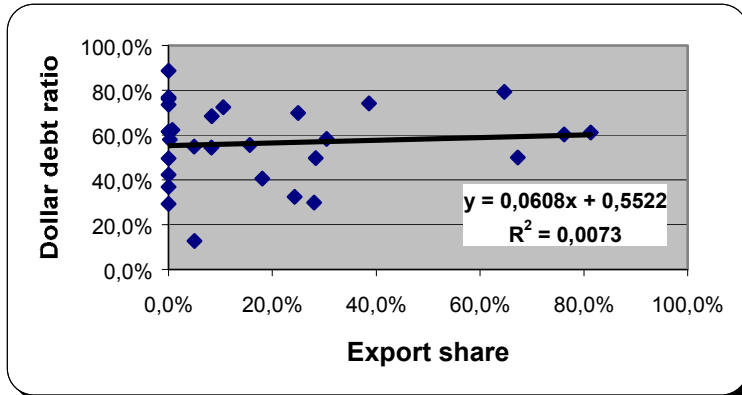
APPENDIX

Definition of variables (sources in parentheses)

o **Dollar Debt:** Converted into local currency using the end-of-period ER for the reported year (Balance sheet data from Economatica, Buenos Aires Stock Exchange, regulatory agencies, or Inspeccion General de Justicia).
o **Leverage Ratio (Total Debt):** Sum of short-term and long-term debt (Balance sheet data).
o **Investment:** Purchases of fixed assets net of disposal of fixed assets (Cash-flow Statements).
o **Assets:** Sum of total current assets, long-term receivables, investment in unconsolidated subsidiaries, other investments, net property, plant and equipment, and other assets (Balance sheet data).
o **Sales**: Revenues from main operating activities (Income Statement data).
o **Earnings**: Earnings before accrued interest, taxes, depreciation and amortization (EBITDA = Operating income + Depreciation and Amortization) (Cash flow Statements).
o **Expo:** Sector export content (measured as the export-to-value added ratio). Firms are assigned to sectors according to their production mix (Ministry of Finance).
o **Impo:** Sector import content (measured as the import-to-value added ratio). Firms are assigned to sectors according to their production mix (Ministry of Finance).
o **Deflator:** Sector price deflator (sectoral value added at current prices / sectoral value added at constant prices), normalized by the GDP deflator (Ministry of Finance).
o **REER:** Real effective exchange rate, measured as the average bilateral RER vis a vis its main trade partners, weighted by the average export share for 1995-1999, end of period (ECLAC, based on IMF).
o **CRISK:** Currency risk measured as the differential between peso and dollar interbank deposit rates, using daily one-month interest rate premiums, period average (Central Bank of Argentina).
o **Dollar Index:** Dummy that equals one for privatized firms in regulated sectors if rates are indexed by the U.S.´s CPI.

Appendix Table 1. List of Companies and Available Observations

Publicly Traded - Always Private

Firms	1993	1994	1995	1996	1997	1998	1999	2000	2001	TOTAL
Acindar	X	X	X	X	X	X	X	X	X	9
Agrometal	X	X	X	X	X	X	X	X	X	9
Alpargatas	X	X	X	X	X	X	X	X	X	9
Alto Palermo			X	X	X	X	X	X	X	7
Aluar	X	X	X	X	X	X	X	X	X	9
American Plast	X	X	X	X	X	X	X	X	X	9
Astra	X	X	X	X	X	X	X	X		8
Atanor	X	X	X	X	X	X	X	X	X	9
BAESA	X	X	X	X	X	X	X	X		8
Boldt		X	X	X	X	X	X	X	X	8
Caputo	X	X	X	X	X	X	X	X	X	9
Carlos Casado	X	X	X	X	X	X	X	X	X	9
Celulosa	X	X	X	X	X	X	X	X	X	9
Ceramica San Lorenzo			X	X	X	X	X	X	X	7
CINBA	X	X	X	X	X	X	X	X	X	9
Colorin	X	X	X	X	X	X	X	X	X	9
Sociedad Comercial del Plata S.A.	X	X	X	X	X	X	X	X	X	9
Cresud	X	X	X	X	X	X	X	X	X	9
Della Penna		X	X	X	X	X	X	X	X	8
Disco			X	X	X	X	X	X	X	7
Domec	X	X	X	X	X	X	X	X	X	9
Dycasa	X	X	X	X	X	X	X	X	X	9
Estrada	X	X	X	X	X	X	X	X	X	9
Ferrum	X	X	X	X	X	X	X	X	X	9
Fiplasto	X	X	X	X	X	X	X	X	X	9
Garovaglio	X	X	X	X	X	X	X	X	X	9
Grimoldi	X	X	X	X	X	X	X	X	X	9
Introductora	X	X	X	X	X	X	X	X	X	9
IRSA	X	X	X	X	X	X	X	X	X	9
Ledesma	X	X	X	X	X	X	X	X	X	9
Longvie	X	X	X	X	X	X	X	X	X	9
Massuh	X	X	X	X	X	X	X	X	X	9
Minetti Juan	X	X	X	X	X	X	X	X	X	9
Mirgor		X	X	X	X	X	X	X	X	8
Molinos Rio	X	X	X	X	X	X	X	X	X	9
Morixe	X	X	X	X	X	X	X	X	X	9
N Piccardo	X	X	X	X	X	X	X	X	X	9
Particulares	X	X	X	X	X	X	X	X		8
Patagonia	X	X	X	X	X	X	X	X	X	9
Pecom Energia SA	X	X	X	X	X	X	X	X	X	9
Perkins	X	X	X	X	X	X	X	X	X	9
Polledo	X	X	X	X	X	X	X	X	X	9
Quilmes Industrial					X	X	X	X	X	5
Quim Estrella	X	X	X	X	X	X	X	X	X	9
Renault Argentina	X	X	X	X	X	X	X	X	X	9
Rigolleau	X	X	X	X	X	X	X	X	X	9
Instituto Rosenbusch S.A.	X	X	X	X	X	X	X	X	X	9
S.A. San Miguel A.G.I.C.I y F.		X	X	X	X	X	X	X	X	8

	1993	1994	1995	1996	1997	1998	1999	2000	2001	TOTAL
Molinos Juan Semino S.A.	X	X	X	X	X	X	X	X	X	9
Sevel	X	X	X	X	X	X	X	X		8
Sniafa		X	X	X	X	X	X	X	X	8
Sol Petroleo	X	X	X	X	X	X	X	X	X	9
Solvay Indupa	X	X	X	X	X	X	X	X	X	9
Ingenio y Ref. San Martin del Tabacal	X	X	X	X	X	X	X	X	X	9
TOTAL	45	50	53	54	54	54	54	54	49	467

Non-Publicly Traded - Always Private

Firms	1993	1994	1995	1996	1997	1998	1999	2000	2001	TOTAL
CGC			X	X	X	X	X	X	X	7
ARCOR						X	X	X	X	4
Cablevision S.A.					X	X	X	X	X	5
Fargo						X	X	X	X	4
GRAFEX S.A.	X	X	X	X	X	X	X	X	X	9
Drogueria Magna S.A.					X	X	X	X	X	5
Leyden SAICyF	X	X	X	X	X	X	X	X	X	9
Loma Negra				X	X	X	X	X	X	6
Mastellone Hermanos S.A		X	X	X	X	X	X	X	X	8
Midland S.A.	X	X	X	X	X	X	X	X	X	9
Morgan				X	X	X	X	X	X	6
Multicanal S.A			X	X	X	X	X	X	X	7
Pan American Energy						X	X	X	X	4
Papel Prensa S.A	X	X	X	X	X	X	X	X	X	9
Patricios		X	X	X	X	X	X	X	X	9
Sancor Coop. Unidas Ltda	X	X	X	X	X	X	X	X	X	9
INTA S.A.						X	X	X	X	4
Cia Industrial Cervecera						X	X	X	X	4
Schiarre S.A.						X	X	X	X	4
Cia de Radiocomunicaciones Moviles S.A.						X	X	X	X	4
Cargill		X	X	X	X	X	X	X	X	8
La Plata Cereal S.A.		X	X	X	X	X	X	X	X	8
Hewlett Packard	X	X	X	X	X	X	X	X	X	9
Productos Sudamericanos	X	X	X	X	X	X	X	X		8
Wal Mart			X	X	X	X	X	X	X	7
COTO		X	X	X	X	X	X	X	X	8
Wintershall	X	X	X	X	X	X	X	X	X	9
Refinerias del Norte	X	X	X	X	X	X	X	X	X	9
Novartis	X	X	X	X	X	X	X	X	X	9
TyC Sports	X	X	X	X	X	X	X	X		8
Nortel Networks			X	X	X	X	X	X	X	7
ESSO	X	X	X	X	X	X	X	X		8
DROG. SUD	X	X	X	X	X	X	X	X	X	9
UNILEVER		X	X	X	X	X	X	X	X	8
SHELL	X	X	X	X	X	X	X	X	X	9
ARGEAR			X	X	X	X	X	X	X	7
FORD				X	X	X	X	X	X	6
Volkswagen	X	X	X	X	X	X	X	X	X	9
NIDERA	X	X	X	X	X	X	X	X	X	9
REF. MAIZ	X	X	X	X	X	X	X	X	X	9
Gral. Motors		X	X	X	X	X	X	X	X	8
Lucent Technologies	X	X	X	X	X	X	X	X	X	9
TECHINT	X	X	X	X	X	X	X	X	X	9

Firms	1993	1994	1995	1996	1997	1998	1999	2000	2001	TOTAL
Maycar				X	X	X	X	X	X	6
BASF	X	X	X	X	X	X	X	X	X	9
Alto Parana	X	X	X	X	X	X	X	X	X	9
Auchan				X	X	X	X	X	X	6
Agar Cross	X	X	X	X	X	X	X	X	X	9
Air Liquide	X	X	X	X	X	X	X	X	X	9
Cadbury Stani	X	X	X	X	X	X	X	X		8
Productos Roche	X	X	X	X	X	X	X	X	X	9
Bio Sidus	X	X	X	X	X	X	X	X	X	9
Abbott Laboratories	X	X	X	X	X	X	X	X		8
3M	X	X	X	X	X	X	X	X	X	9
AMSA	X	X	X	X	X	X	X	X	X	9
Alusud	X	X	X	X	X	X	X	X	X	9
Chandon	X	X	X	X	X	X	X	X	X	9
Arcos Dorados	X	X	X	X	X	X	X	X		8
Firestone	X	X	X	X	X	X	X	X	X	9
Cabaña Sta Rosa	X	X	X	X	X	X	X	X	X	9
Glencore Cereales	X	X	X	X	X	X	X	X	X	9
Tradigrain	X	X	X	X	X	X	X	X	X	9
Lab. Bago	X	X	X	X	X	X	X	X	X	9
Swift	X	X	X	X	X	X	X	X	X	9
Scania		X	X	X	X	X	X	X	X	8
LAPA	X	X	X	X	X	X	X	X	X	9
SPM			X	X	X	X	X	X		6
NEWSAN	X	X	X	X	X	X	X	X		8
XEROX	X	X	X	X	X	X	X	X	X	9
OLEAGINOSA OESTE	X	X	X	X	X	X	X	X	X	9
COCA COLA		X	X	X	X	X	X	X	X	8
HSBC Salud		X	X	X	X	X	X	X	X	8
Fravega	X	X	X	X	X	X	X	X	X	9
Parmalat	X	X	X	X	X	X	X	X	X	9
TOTAL	46	55	61	66	68	75	75	75	67	588

Publicly Traded - Privatized

Firms	1993	1994	1995	1996	1997	1998	1999	2000	2001	TOTAL
Capex		X	X	X	X	X	X	X	X	8
Central Costanera	X	X	X	X	X	X	X	X	X	9
Central Puerto	X	X	X	X	X	X	X	X	X	9
Ctral Term Bs As			X	X	X	X	X	X	X	7
G C del Oeste					X	X	X	X	X	5
Siderar			X	X	X	X	X	X	X	7
Siderca	X	X	X	X	X	X	X	X	X	9
Telecom	X	X	X	X	X	X	X	X	X	9
Telefonica de Arg	X	X	X	X	X	X	X	X	X	9
Transener				X	X	X	X	X	X	6
YPF	X	X	X	X	X	X	X	X	X	9
Gas Natural BAN .	X	X	X	X	X	X	X	X	X	9
Metrogas .	X	X	X	X	X	X	X	X	X	9
Transp Gas Sur .	X	X	X	X	X	X	X	X	X	9
Distr Gas Cuyana .	X	X	X	X	X	X	X	X	X	9
Camuzzi Gas Pamp. .	X	X	X	X	X	X	X	X	X	9
Metrovias		X	X	X	X	X	X	X	X	8
TOTAL	11	13	15	16	17	17	17	17	17	140

Firms	1993	1994	1995	1996	1997	1998	1999	2000	2001	TOTAL
EDEN S.A.					X	X	X	X	X	5
EDES S.A.					X	X	X	X	X	5
EDEER S.A.					X	X	X	X	X	5
EDELAP S.A.	X	X	X	X	X	X	X	X	X	9
EDENOR S.A.	X	X	X	X	X	X	X	X	X	9
EDESUR S.A.	X	X	X	X	X	X	X	X	X	9
EDELAR S.A.					X	X	X	X	X	5
EDER S.A.					X	X	X	X	X	5
Hidroelectrica Alicura S.A.	X	X	X	X	X	X	X	X	X	9
Hidroelectrica Cerros Colorados S.A.	X	X	X	X	X	X	X	X	X	9
Hidroelectrica Diamante S.A.					X	X	X	X	X	5
Hidroelectrica El Chocon S.A.				X	X	X	X	X	X	6
Hidroelectrica Futaleufu S.A.			X	X	X	X	X	X	X	7
Hidroelectrica Los Nihuiles S.A.					X	X	X	X	X	5
Hidroelectrica Piedra del Aguila S.A.					X	X	X	X	X	5
Hidroelectrica Rio Hondo S.A.				X	X	X	X	X	X	6
Hidroelectrica Tucuman S.A.					X	X	X	X	X	5
PlusPetrol Energy S.A.					X	X	X	X	X	5
Central Dique S.A.	X	X	X	X	X	X	X	X		8
Central Dock Sud S.A.		X	X	X	X	X	X	X	X	8
Central Güemes S.A.	X	X	X	X	X	X	X	X	X	9
Central Piedra Buena S.A.					X	X	X	X	X	5
Central San Nicolas S.A.	X	X	X	X	X	X	X	X	X	9
Central Sorrento S.A.					X	X	X	X	X	5
Centrales Termicas Mendoza S.A.			X	X	X	X	X	X	X	7
Turbine Power Co. S.A.		X	X	X	X	X	X	X	X	8
Distrocuyo S.A.			X	X	X	X	X	X	X	7
Transba S.A.				X	X	X	X	X	X	6
Transnea S.A.		X	X	X	X	X	X	X	X	8
Transnoa S.A.		X	X	X	X	X	X	X	X	8
Enecor					X	X	X	X	X	5
Líneas de Transmisión del Litoral S.A.				X	X	X	X	X	X	6
BAP	X	X	X	X	X	X	X	X	X	9
Ferroexpreso Pampeano	X	X	X	X	X	X	X	X	X	9
FERROCARRIL MESOPOTÁMICO	X	X	X	X	X	X	X	X	X	9
Ferrosur Roca	X	X	X	X	X	X	X	X	X	9
NCA	X	X	X	X	X	X	X	X	X	9
Ferrovias		X	X	X	X	X	X	X	X	8
TBA			X	X	X	X	X	X	X	7
TMB		X	X	X	X	X	X	X	X	8
TMR			X	X	X	X	X	X	X	7
TMS		X	X	X	X	X	X	X	X	8
Litoral Gas	X	X	X	X	X	X	X	X	X	9
GASNOR	X	X	X	X	X	X	X	X	X	9
Camuzzi Gas del Sur S.A.	X	X	X	X	X	X	X	X	X	9
Distribuidora de Gas del Centro S.A.	X	X	X	X	X	X	X	X	X	9
TGN	X	X	X	X	X	X	X	X	X	9
Correo Argentino S.A.					X	X	X	X	X	5
Aguas Argentinas		X	X	X	X	X	X	X	X	8
Aeropuertos Argentina 2000						X	X	X	X	4

										Total
Autopistas del Sol S.A.		15	X	X	X	X	X	X	X	7
Telecom Personal S.A.						X	X	X	X	4
Startel S.A.	X	X	X	X	X	X	X			7
Aerolíneas Argentinas			X	X	X	X	X	X		6
Caminos del Oeste	X	X	X	X	X	X	X	X	X	9
PLUSPETROL				X	X	X	X	X	X	6
TOTAL	**20**	**28**	**35**	**40**	**54**	**56**	**56**	**55**	**53**	**397**