

Does direct foreign investment affect domestic firms credit constraints?*

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Abstract: Firms in developing countries typically cite credit constraints as one of their primary obstacles to investment. By bringing in scarce capital, it is often argued that foreign direct investment may ease domestic firms' credit constraints. Alternatively, if foreign firms borrow heavily from domestic banks, they may exacerbate domestic firms' credit constraints by crowding them out of domestic capital markets. One plausible mechanism by which this may happen is indirect. Foreign firms may be more experienced and have better financial ratios and thus, be a safer bet for lending institutions. Using firm-level data from the Ivory Coast for the period 1974-1987 we test the following hypotheses: (1) domestic firms are more credit constrained than foreign firms and (2) borrowing by foreign firms exacerbates the credit constraints of domestic firms. Results suggest that foreign borrowers crowd out domestic borrowers. We also explore differences in financing constraints and crowding out between public and private enterprises. Our results suggest that public sector enterprises are less financially constrained than other domestic enterprises, consistent with the notion of a "soft budget constraint". Finally, we explore possible explanations for the apparent crowding out effect.

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"Not all foreign direct investment around the world represents net capital flows. Often such investments are financed in local markets."

Martin Feldstein (2000)

1. Introduction

Firms in developing countries typically cite credit constraints as one of their primary obstacles to investment. In a recent survey of executives in 20 African countries, financing constraints were cited as a major obstacle to business expansion (Africa Competitiveness Report (1998)). In the Ivory Coast, financing constraints were ranked third out of 21; the first and second obstacles were taxation and political instability. Evidence also suggests that domestically owned businesses in these countries are much more likely to face credit constraints than multinational firms. In a recent survey on Kenya, the primary complaint of domestically owned businesses was credit constraints. Multinational enterprises in Kenya, however, did not cite credit constraints as a problem. Rather, they cited access to foreign exchange as their primary obstacle to doing business.

Apart from anecdotal and survey evidence, there is little empirical evidence on capital market imperfections and firm level investment in developing countries¹. One reason for the lack of empirical evidence for developing countries is the difficulty in obtaining detailed firm-level data for these countries. Most of the existing evidence is difficult to interpret because these surveys are typically administered by institutions in a position to make loans such as the World Bank. Hence, firms have an incentive to report that they are credit constrained. Leading theorists, however, recognize the important role that capital market imperfections play in developing countries.² There is also a large body of empirical evidence for developed countries that suggests that capital market imperfections play an important role in determining firm-level investment decisions.³

¹ Exceptions are Tybout ('83), Harris et al. ('94), Jaramillo et al. ('96), Gelos et al. ('99) and Patillo ('00).

² See for example, Aghion et al. (1999) and Banerjee and Newman (1994).

³ For an excellent survey, see "Capital-Market Imperfections and Investment," by R. Glenn Hubbard, JEL, March 1998.

In this paper, we analyze whether incoming foreign investment in developing countries plays an important role in alleviating domestic credit constraints. It is often argued that foreign direct investment (FDI) may ease domestic firms' credit constraints by bringing in scarce capital. This is one of the reasons policy makers in developing countries have eased restrictions on inward FDI and in many instances provide special incentives for FDI. Yet, if foreign firms borrow heavily from local banks, they may exacerbate domestic firms credit constraints by crowding them out of domestic capital markets. We will measure the impact of incoming foreign investment on domestic credit constraints using firm-level data for the Ivory Coast. Anecdotal evidence from the Ivory Coast suggests that foreign firms borrowed heavily in local credit markets⁴:

"In the early 1970s Ivoirian rates of interest were considerably lower than those in European countries, thus encouraging foreign enterprises to borrow as much money as possible in Cote d'Ivoire and to keep their liquid funds abroad. At one time during the period, an estimated 70 percent of the credits extended by the Ivoirian banking system went to foreign-owned companies." [Federal Research Division, Library of Congress, 1991]

Why would borrowing by foreign firms crowd out domestic firms? One plausible mechanism by which this may happen is indirect. Foreign firms may simply be more profitable and/or have access to more collateral and thus be a better investment for lending institutions⁵. A World Bank country economic report (1980) suggests that local banks did find lending to local enterprises more costly because they were generally considered more risky. This problem was compounded by the fact that interest rates were fixed, thus creating excess demand for loans and the likelihood of credit rationing. Because of interest rate ceilings, banks could not compensate for the extra cost of lending to domestic firms and hence would prefer to lend to foreign firms⁶.

⁴ Ironically, it appears that because foreign firms preferred to keep savings offshore, there was little domestic capital to draw on. Thus the government borrowed abroad to finance domestic programs (World Bank (1978), United States (1991)).

⁵ Alternatively, it may have been that foreign firms had better relationships with the bankers for any of a variety of reasons.

⁶ This same study states that because of low domestic interest rates, foreign firms preferred to keep excess liquidity offshore. And, as a result, the government borrowed heavily abroad to capitalize local banks.

Empirical evidence for developed countries is largely based on models of investment that incorporate a role for imperfect information. In the presence of asymmetric information and incentive problems in capital markets, external funds will carry a risk premium and thus, investment decisions may be influenced by the availability of internal resources. In the absence of such problems, the only thing that should determine firm investment is the expected future profitability of that investment. Thus, empirical work has focused on ways to estimate the influence of information costs on investment by isolating the impacts of internal resources and expected future profitability on firm level investment. The principle findings of this research are that, *ceteris paribus*, changes in internal resources are correlated with investment and that this correlation is strongest for firms that are most likely to face information related capital constraints.

Drawing on this literature for developed countries, we test the following hypotheses using firm level data from the Ivory Coast for the period 1974-1987: (1) domestic firms are more credit constrained than foreign firms and (2) borrowing by foreign firms exacerbates the credit constraints of domestic firms. To test for the impact of FDI on domestic firms' credit constraints, we follow the approach used by Bond and Meghir (1994) of including cash flow variables in an Euler investment model.⁷ In the absence of credit constraints, cash flow should not be a significant predictor of future investment. Using this framework, we test whether in fact foreign firms are less credit constrained than domestic firms. We also explore differences in financing constraints and crowding out between public and private enterprises. Finally, we investigate the possibility that foreign firms may crowd domestic firms out of domestic capital and/or product markets.

Our results suggest that both domestic and foreign firms do face credit constraints and that domestic firms are significantly more credit constrained than foreign firms. We also find evidence of crowding out. Specifically, controlling for sectoral variation and variation over time, we find that the share of foreign long-term borrowing at the sector level exacerbates domestic

⁷ We also try a number of alternative investment equations as do Bond et al. (1997). Like Bond et al., we find that our results are not very sensitive to the choice of investment model and hence do not report these results.

firms' credit constraints and has no effect on foreign firms' credit constraints⁸. When we split domestic firms into public and private firms, we find that public firms' investment decisions are not sensitive to lagged cash flow. Nor is there any evidence that public firms are affected by foreign borrowing in domestic credit markets. We interpret this as evidence in support of the notion of a soft budget constraint for public firms. In contrast, private domestic firms appear more credit constrained than foreign firms and are crowded out by foreign borrowing. Finally, we find no evidence that this crowding out takes place via product markets.

To determine why it is that domestic firms are more credit constrained than foreign firms, we compare the profitability of domestic and foreign firms using standard ratio analysis. Overall, foreign firms are less highly leveraged, more liquid and more profitable than domestic firms. Thus, it may be that given the choice, lenders prefer to lend to foreign firms. However, when we interact relative profitability with cash flow, we find little evidence that it is relative profitability that is driving our results. Instead, the share of foreign long-term borrowing remains significant. We conclude that the relative profitability of foreign firms may matter but that it is not driving our results.

Finally, we briefly consider the welfare implications of our results. To properly account for the total impact of FDI on the host country, we would need to take into account the impact of foreign investment on domestic wages, profits, and employment; the role of foreign investors in promoting technology transfer; and the contribution of foreign investors to tax revenues. This is beyond the scope of this paper. However, we do compute the net impact of FDI on the availability of capital, adding together the inflows from equity purchases and foreign borrowing and subtracting the local borrowing of these firms. Because in the Ivory Coast, the majority of FDI was financed locally, FDI did not represent an increase in net capital flows to the economy. In fact, borrowing on local credit markets by foreign firms significantly exceeded the sum of equity purchases and foreign borrowing by these firms.

⁸ In an earlier version of the paper, we included public debt as well as long-term and short-term debt. We find evidence of significant crowding out in the public debt market. Because long-term debt includes public debt, we do not include public debt in this version of the paper.

The remainder of this paper is organized as follows. Section 2 outlines the general approach used for testing for credit constraints and crowding out. Section 3 describes the data. Section 4 presents results of estimation. Section 5 explores the underlying reasons for the differences between domestic and foreign firms borrowing capabilities. Section 6 discusses the welfare implications and Section 7 concludes.

2. Testing for Credit Constraints and Crowding Out: The Framework

A large body of literature is devoted to determining the impact of financing constraints on investment behavior. The central idea of these studies is that investment should not be determined by a firm's net worth or internal funds but only by the firm's expected future profitability. The primary means for testing this hypothesis has been to estimate investment equations including Tobin's Q (as a proxy for expected future profitability) and measures of net worth as explanatory variables. To the extent that measures of net worth predict investment behavior, researchers conclude that financing constraints are present.

We use a similar approach except that the firms in our sample are not publicly traded and hence we do not have a direct measure of Tobin's Q. Instead, we use an Euler equation approach with additional controls for expected future profitability. This follows fairly closely the approach used by Bond and Meghir (1994) and Bond et al. (1997)⁹. Using this framework, we focus on two basic questions: (1) are firms in the Ivory Coast credit constrained, and (2) does borrowing by foreign firms exacerbate the credit constraints of domestic firms. Both of these hypotheses can be nested in the same general specification. To test for the presence of credit constraints, we included cash flow variables in these basic investment equations. And, to test for a differential impact of ownership, we include an interaction term equal to cash flow times ownership. Finally, to test for the possibility of crowding out, we include a variable that measures the overall level of

⁹ Like Bond et al. (1997), we did estimate the accelerator model and the error correction model. In the empirical estimation, the results are almost identical to the Euler model and Bond et al. find that their results are not sensitive to the choice of model. Thus, instead of presenting these results, we include results that extend the Euler model to include other variables that might capture expected future profitability.

foreign borrowing by sector and a variable that measures the overall level of foreign sales by sector. The model is described below in more detail.

2.1. An Euler equation specification

We estimate a version of the Euler equation based on Bond and Meghir (1994). This is a relation between investment rates in successive periods, derived from dynamic optimization in the presence of symmetric, quadratic costs of adjustment. Under these assumptions, and as long as we assume that expectations are formed accordingly, the Euler equation model has the advantage of controlling for all expectational influences on the investment decision. Thus, we are not as susceptible to the criticism that financial variables are merely picking up information about expected future profitability of the firm.

The firm is assumed to maximize the present discounted value of current and future net cash flows. Letting L_{it} denote variable factor inputs, w_{it} the price of variable factors p^I_{it} the price of the investment good, p_{it} the price of output, β^t_{t+j} the nominal discount factor between period t and period $t+j$, δ the rate of depreciation, $F(K_{it}, L_{it})$ the production function gross of adjustment costs, $G(I_{it}, K_{it})$ the adjustment cost function and $E_t(\cdot)$ the expectations operator conditional on information available in period t , the firm solves

$$\max E_t \left[\sum_{j=0}^{\infty} \beta^t_{t+j} R(K_{i,t+j}, L_{i,t+j}, I_{i,t+j}) \right] \quad (1)$$

$$\text{s.t. } K_{it} = (1-d)K_{i,t-1} + I_{it}$$

$$\text{where } R_{it} = p_{it} F(K_{it}, L_{it}) - p_{it} G(I_{it}, K_{it}) - w_{it} L_{it} - p^I_{it} I_{it}.$$

The Euler equation characterizing the optimal investment path relates marginal adjustment costs in adjacent periods. This can be written as,

$$-\left(\frac{\partial R}{\partial I}\right)_{it} = -(1-d) b'_{t+1} E_t \left(\frac{\partial R}{\partial I}\right)_{i,t+1} + \left(\frac{\partial R}{\partial K}\right)_{it}. \quad (2)$$

Assuming competitive markets and that $F(K_{it}, L_{it})$ is constant returns to scale, and specifying $G(I_{it}, K_{it}) = (b/2) * [(I/K)_{it} - c]^2 K_{it}$, this can be expressed as,

$$\left(\frac{I}{K}\right)_{it} - a_1 \left(\frac{I}{K}\right)_{it}^2 = a_2 E_t \left(\frac{I}{K}\right)_{i,t+1} + a_3 \left[\left(\frac{C}{K}\right)_{it} - U_{it}\right] + a_0, \quad (3)$$

$$\text{where } C_{it} = p_{it} F(K_{it}, L_{it}) - p_{it} G(I_{it}, K_{it}) - w_{it} L_{it}$$

is real cash flow and U_{it} is the real user cost of capital. Current investment is positively related to expected investment and to the current average cash flow term (reflecting the marginal profitability of capital under constant returns), and negatively related to the user cost of capital.

To implement this model, we replace the unobserved $E_t (I/K)_{i,t+1}$ by the realized $(I/K)_{i,t+1}$ plus a forecast error, and take this $(I/K)_{i,t+1}$ term to the left-hand side to obtain an econometric model that is linear in variables. We also include sector-specific effects that may be introduced either by non-constant returns to scale or by monopolistic competition in the product market. The resulting empirical specification is,

$$\left(\frac{I}{K}\right)_{ij,t+1} = b_1\left(\frac{I}{K}\right)_{ijt} - b_2\left(\frac{I}{K}\right)_{ijt}^2 - b_3\left(\frac{C}{K}\right)_{ijt} + b_4U_{ijt} + s_j + v_{ij,t+1}. \quad (4)$$

An attractive feature of the Euler equation model is that it should control for the influence of financial variables on expectations of future profitability. Under the null of no financial constraints, it can be shown that $\beta_3 > 0$. The negative association between current cash flow and future investment is explained in the following way. A high level of current cash flow implies lower net marginal adjustment costs today. Because in equilibrium, marginal adjustment costs are equated across periods in expectation, this implies lower expected marginal adjustment costs and hence lower expected investment tomorrow. Under the alternative, investment spending is positively related to cash flow or profits through the effect of financial constraints.

2.2. Testing for Credit Constraints and Crowding Out using the Euler Specification

We modify the basic specification in (4) to test whether domestic firms are relatively more credit constrained than foreign firms by including an interaction term that combines cash flow and foreign ownership. To test whether foreign presence in sector j and year t increases domestic firms' sensitivity of investment to cash flow, we interact lagged cash flow with the share of foreign borrowing in sector j and year t and we interact lagged cash flow with the share of foreign sales in sector j and year t . The first interaction term is meant to capture "credit rationing" by lenders. The second interaction term captures the possibility that firms get crowded out of product markets making them less profitable and less attractive to lenders. The resulting specification is given by equation (5):

$$\begin{aligned} \frac{I_{ijt}}{K_{ij,t+1}} = & b_1\left(\frac{I}{K}\right)_{ijt} - b_2\left(\frac{I}{K}\right)_{ijt}^2 + b_3U_{ijt} \\ & + b_4cf_{ijt} + b_5cf_{ijt} * DFI_Firm_{ijt} + b_6DFI_Firm_{ijt} \\ & + b_7cf_{ijt} * FDEBT_Sector_{jt} + b_8cf_{ijt} * FDEBT_Sector_{jt} * DFI_Firm_{ijt} \\ & + b_9cf_{ijt} * FSALE_Sector_{jt} + b_{10}cf_{ijt} * FSALE_Sector_{jt} * DFI_Firm_{ijt} \\ & + b_{11} * FDEBT_Sector_{jt} + b_{12} * FSALE_Sector_{jt} + s_j + e_{ijt} \end{aligned}$$

Operating cash flow is denoted cf and is measured as a share of the capital stock. A positive coefficient on cash flow is a sign that firms face credit constraints. DFI_Firm is the share of foreign equity participation at the plant level, which varies between 0 and 100 percent. If foreign ownership in a plant increases the overall level of investment, we should observe a positive coefficient on DFI_Firm_{ijt} . If foreign firms are less credit constrained than domestic firms then the sign of the coefficient on the interaction between cash flow and DFI_Firm should be negative. $FDEBT_Sector_{jt}$ is a measure of the level of foreign borrowing in sector j at time t . If the level of foreign borrowing in sector j crowds out domestic borrowing in sector j at time t , then the coefficient β_7 should be positive. The coefficient β_8 accounts for the fact that only domestic firms may be crowded out. $FSALE_Sector_{jt}$ is a measure of the level of foreign sales in sector j at time t . If the level of foreign sales in sector j makes domestic firms less profitable and therefore less able to borrow in sector j at time t , then the coefficient β_9 should be positive. As with foreign borrowing, the coefficient β_{10} allows for a differential impact of the share of foreign firms on foreign as opposed to domestic firms.

2.3. Estimation Issues

A number of issues come up in the estimation of equation (5). First, the user cost of capital is typically unobservable. Most researchers including Bond and Meghir (1994) proxy the user cost of capital with firm dummies. Instead, we use as a proxy for the user cost of capital, the coefficient of variation of real profits relative to other firms in the same industry. Our choice of proxy for the user cost of capital is based on recent work by Minton and Schrand (JFE, 99) who find that cash flow volatility is generally associated with lower average levels of investment and a higher cost of accessing external capital. Although one possible critique of this approach is that the user cost of capital only accounts for one component of differences across firms (which are fixed over time), we also performed basic fixed-effects specifications. Since those specifications

did not affect the overall results¹⁰ (in fact, F-tests reject the significance of fixed effects for domestic enterprises) we do not report them here. Second, our model is restrictive in the sense that we assume that the only way in which foreign and domestic firms differ is via the sensitivity of investment to cash flow. A less restrictive version of the model in which all coefficients are allowed to vary is presented in equation (6). Equation (6) is similar to results we would get if we were to estimate equation (5) separately for domestic and foreign firms. The advantage of estimating the coefficients together is that we may directly compare the coefficients. Third, several studies examining the importance of credit constraints suggest that firm size may be an important determinant of a firm's ability to secure outside financing. To control for firm size, we include lagged values of the log of real sales.

Finally, and probably most important, how do we know that the Euler specification is the "true" model? If it is not, then lagged cash flow may simply be capturing expected future profit opportunities. If this were the case, then a positive coefficient on lagged cash flow would simply be an indication that firms are investing in response to opportunities to make a profit and not an indication that firms are credit constrained. A large body of literature has been devoted to this topic alone¹¹. The standard approach for dealing with this problem is to include Tobin's Q as a proxy for the firms investment opportunities¹². Because the firms in our sample are not publicly traded, we cannot use this approach. Instead, the approach we use is to add lags of real sales growth to proxy for future investment opportunities.¹³ Our final estimating equation is thus:

¹⁰ The main difference between the within estimates and the OLS estimates is the coefficient on the lagged dependent variable.

¹¹ See Schiantarelli (1996) and Hubbard (1998) for a thorough discussion of this issue.

¹² Although even this approach has drawbacks as it is not obvious that the average observed Q is a good proxy for marginal Q, the theoretical determinant of investment.

¹³ Alternatively, Gilchrist and Himmelberg (1995) construct an explicit investment fundamentals or Fundamental Q by forecasting future profitability using vector autoregressions (VARs). The two approaches are equivalent, though, since the sum of discounted expected profits calculated from a VAR is still a linear function of the instruments at time t.

$$\frac{I_{ijt+1}}{K_{ijt+1}} = \sum_{O=d}^f \left[\begin{aligned} & \mathbf{b}_1^O \left(\frac{I}{K} \right)_{ijtO} - \mathbf{b}_2^O \left(\frac{I}{K} \right)_{ijtO}^2 + \mathbf{b}_3^O U_{iO} + \mathbf{b}_4^O cf_{ijtO} + \mathbf{b}_5^O size_{ijtO} + \mathbf{b}_6^O growth_{ijtO} \\ & + \mathbf{b}_7^O cf_{ijtO} * FDEBT_Sector_{jtO} + \mathbf{b}_8^O FDEBT_Sector_{jtO} \\ & + \mathbf{b}_9^O cf_{ijtO} * FSALE_Sector_{jtO} + \mathbf{b}_{10}^O FSALE_Sector_{jtO} + s_{jO} + d_{t+1,O} + \mathbf{e}_{ijtO} \end{aligned} \right] \quad (6)$$

Where O stands for ownership, d is domestic and f is foreign. Firms with more than an average of 49% foreign ownership over the sample period are considered foreign, otherwise, they are domestic. Firm size is proxied by the log of real sales, *size*, and the additional control for future profitability is real sales growth, *growth*. We also include sector dummies, *s*, and time dummies, *d*. Results of estimating equation (6) are presented in Tables 1 and 2 of section 4 of the paper. Tables 3 and 4 of section 4 present results of a slightly modified version of equation (6) where we break domestic investment down into its public and private components.

3. Data

The firm data are taken from the Banque de Donnees Financieres (BdDF), which is instructed to gather annual information on all industrial firms in the Ivory Coast. The number of firms in individual years ranges from around 250 in the 1970s to nearly 500 in the mid-1980s. Although the coverage of the industrial sector is incomplete (informal enterprises are excluded and small formal firms are under-represented), the BdDF covers almost all large and medium-sized formal manufacturing enterprises. From this sample, we deleted a number of observations where firms reported zero or negative sales, employees, and/or material inputs. This left us with a sample of 341 firms over the period 1974-1987.

We estimate equation (6) using our panel of 341 Ivorian firms during the period 1974-1987. These estimates require data on real output, capital stock, labor costs, material costs, investment, borrowing and ownership shares. We do not use reported profits instead we compute

operating cash flow as total sales less the cost of labor, material inputs and taxes. The value of the real capital stock was constructed using the perpetual inventory method. All variables were deflated by two-digit sectoral level price deflators to obtain a real output. Table A.4 reports

$$FDEBT_Sector_{jt} = \frac{\sum_i DEBT_{ijt} * DFI_Firm_{ijt}}{\sum_i DEBT_{ijt}} \quad (7)$$

summary statistics for the 341 firms in our sample.

$$FSALE_Sector_{jt} = \frac{\sum_i REAL\ SALES_{ijt} * DFI_Firm_{ijt}}{\sum_i REAL\ SALES_{ijt}} \quad (8)$$

Our measure of foreign borrowing at the sectoral level is defined as:

And our measure of foreign sales at the sectoral level is defined as:

Our justification for using sector level variables derives from the fact that in order to mitigate portfolio risk, banks frequently diversify according to sector¹⁴. As an illustration, one 1995 publication which discusses bank risk management explains that “diversification means avoiding concentration in a single company, *industry group* or geographic area” [italics added for

¹⁴ Chapter 10 in Active Bank Risk Management: enhancing investment & credit portfolio performance, 1995.

emphasis]. We also have evidence that in 1976 banks in the Ivory Coast were assigned sectoral limits by the Banque Centrale des Etats de L'Afrique de L'Ouest (World Bank, 1978)¹⁵.

The importance of foreign equity participation during the period 1974 to 1987 is significant and variable by sector (see Table A.2). The share of foreign equity was particularly high in the leather industry (93.12%) while in other sectors such as coffee it was less important (52.44%). Domestic participation is split between private and public firms with private domestic firms taking the lead in coffee (44.69%) and domestic public firms taking the lead in cooking oils (32.63%). In addition to cross-section variation, there were also substantial changes in the share of foreign ownership over the sample period.

Although variable, foreign participation in the Ivorian economy remained substantial throughout the period we study. Table A.5 indicates that as a share of total reported sales in the economy foreign firms accounted for 83.15% in 1975 and 70.10% in 1987. The importance of borrowing by foreign firms is a slightly trickier issue since it is likely that foreign firms have access to funds overseas while domestic firms may not. Table A.5 indicates that as a share of total credit in the economy foreign firms accounted for 76.32% in 1975 and 60.89% in 1987. This probably overstates somewhat the extent to which foreign firms dominated local credit markets. Data for 1985 (Table A.1) indicate that on average only 8% of foreign firms' long-term funds came from overseas. Thus, a substantial portion of borrowing by foreign firms was done locally.

The number of firms in each sector and the distribution of ownership are provided in Table A.2. For purposes of presentation, we aggregate up to the 2-digit SIC level or ten sectors: grain processing, food processing, other food, textiles, chemicals, transport, machinery, resource extraction, wood, and paper products. Our analysis defines sector at the four digit level.

4. Investment Equation Estimates

¹⁵ The majority of manufacturing activity was located in Abidjan and thus it would have been impossible to diversify on a regional basis (World Bank, 1978).

Table 1 reports the results from estimating equation 6. As we discussed earlier, we control for firm-specific differences in investment with our measure of the user cost capital, which is defined as the coefficient of variation on real profits relative to other firms in the sector. Since this measure is perfectly collinear with firm dummies, we are able to estimate equation 6 using ordinary least squares. Although one possible critique of this approach is that the user cost of capital only accounts for one component of differences across firms (which are fixed over time), we also performed basic fixed effects specifications. Since those specifications did not affect the overall results (in fact, F-tests reject the significance of fixed effects for domestic enterprises) we do not report them here.

The basic specification, which does not distinguish between domestic and foreign plants, is reported in column (1). The coefficient on lagged cash flow is positive and significant, suggesting that on average, firms in the manufacturing sector in Cote d'Ivoire are credit constrained.

Column (2) allows the coefficients to vary across foreign-owned and domestically-owned firms. As indicated earlier, a foreign firm is defined as one for which more than 49 percent of the equity is owned by foreigners. The coefficient on cash flow is significantly lower for foreign firms, with a value that is about half of that for domestic firms. This suggests that domestic firms are more credit constrained than foreign firms.

Column (3) tests for crowding out in the financial sector. As in column (2), we allow the coefficients on the independent variables to vary across foreign and domestic enterprises. The coefficient on the interaction of cash flow (CF) and the share of foreign borrowing at the sector level indicates the extent of crowding out. We examine the possibility for crowding out in the long-term credit market and the short term credit market. The results in column (3) indicate that foreign firms in the long-term credit market crowd out domestic firms. The coefficient on cash flow interacted with sectoral foreign share of total borrowing is positive and statistically significant. The results in column (3) also indicate that there is no crowding out of foreign firms: cash flow interacted with sectoral foreign share of borrowing is not significant in either the short

or the long-term credit market. In contrast to the results reported in column (2), the coefficient on cash flow alone is closer in magnitude for domestic enterprises and foreign firms. In fact, the results appear to suggest that after controlling for the possibility of crowding out, domestic firms are less credit constrained. These results suggest that one source of credit constraints for domestic enterprises identified in column (2) is the crowding out which occurs as a result of foreign entry.

One possible explanation for the observed correlation between CF^* (foreign sector share of total borrowing) and investment could be the following: domestic firms face greater domestic competition with foreign entry. Increased competition—which could be correlated with the foreign share in domestic borrowing—leads to both lower investment and a decline in profits, which are correlated with cash flow. We test for this possibility in column (4). We add an additional term, $\text{cash flow} * (\text{Share Foreign Sales})$ to the basic specification. Share Foreign Sales is defined as the share of foreign-owned firms in total sales in a particular sector and year. If foreign borrowing is simply a proxy for competition, then the crowding out variables should become statistically insignificant. The results in column (4) suggest that this is not the case. The coefficients on CF^* foreign sectoral borrowing remain the same in magnitude and are statistically significant for long-term borrowing.

It is interesting to note that the user cost of capital negatively affects investment for foreign enterprises but has no impact on domestic firms. Foreign firms respond more to higher capital costs, which are proxied here with the coefficient of variation on real profits. These results are consistent with unreported results showing that there are time invariant differences across foreign enterprises (captured here by the user cost of capital term) but not across domestic enterprises.

One potential criticism which appears frequently in the literature on using the cash flow-investment relationship to identify credit constraints is the following claim: cash flow may be positively correlated with current investment because cash flow also predicts future profitability, which raises current investment. A number of studies address this problem by including Tobin's

Q or adding other measures of future profitability, such as leads of sales growth. Since none of these firms are listed firms, we cannot construct a measure for “Q”. Instead, we add lagged real sales growth as an indicator of future profitability. We also add firm size, defined as the lagged log of sales, since that is also likely to be correlated with credit constraints. The results are reported in Table 2.

The results in Table 2 suggest that the interaction between cash flow and foreign investment is not a proxy for future profitability. The coefficients on cash flow and cash flow interacted with foreign ownership remain significant and of the same magnitude as before. As expected, the coefficient on lagged sales growth is positive and significant, indicating that plants with high growth in sales have higher investment rates in the future.

It could be argued that firm size and lagged sales growth are not adequate measures of future profitability. In Table 3, we add alternative measures which are considered good measures of profitability. These include the lagged profit margin, the lagged return on assets, and lagged asset turnover. The profit margin is defined as the ratio of real profits to real sales, return on assets is defined as the ratio of real profits to real assets, and asset turnover is defined as the ratio of real sales to real assets. These additional controls do not affect the results reported earlier. We conclude that cash flow is not significant because it proxies for the profitability of the individual enterprise.

In a number of African countries, the public sector plays a major role in all aspects of the economy, including manufacturing. Cote d’Ivoire is no exception. Appendix Table A.2 shows that public sector enterprises account for a large share of sales in a number of sectors, such as food products, rubber and cement. Yet, public sector enterprises are likely to face a very different set of credit constraints than their private sector counterparts. Bertero and Rondi (2000) indicate that the cash flow-investment correlation could differ from private sector firms for a number of reasons. To the extent that public sector enterprises benefit from a soft budget constraint, they may be less credit constrained than private enterprises. This would indicate a weaker link (or no link at all) between investment and cash flow. On the other hand, an argument could also be

made that the link between cash flow and investment is likely to be stronger for public enterprises. Bertero and Rondi (2000) argue that agency problems are more severe in public enterprises. To the extent that managers of public sector enterprises are more likely to pursue private objectives, they may wish to over invest relative to the optimum. This may lead us to find a stronger link between cash flow and investment for this set of firms.

Table 4 redoes the specification reported in Table 2, but allows coefficients to vary across public and private enterprises. In Table 4, column (1) reports the coefficient on cash flow, without allowing for the possibility of crowding out. While the coefficients on cash flow remain significant and positive for foreign and non-foreign private enterprises, the coefficient on cash flow for public sector enterprises is statistically insignificant. The coefficient on lagged cash flow remains statistically insignificant in columns (2) and (3), suggesting that public sector enterprises are not credit constrained. These results are consistent with the perception that public sector enterprises, due to their access to soft loans or government support, are less likely to be credit constrained than private sector enterprises.

Columns (2) and (3) test for crowding out by foreign firms. Across all specifications, the results suggest that public sector enterprises are unaffected by foreign investors. Our previous results for foreign and private domestic enterprises remain the same: foreign firms are not affected by other foreign firms who borrow in the credit markets, but domestic, non-public enterprises are crowded out of the long term credit markets.

There appears to be fairly robust evidence of crowding out of domestic firms by foreign firms. The interaction between cash flow and the level of foreign borrowing at the sector level is positive and significant across all specifications. Finally, the negative coefficient on the interaction between cash flow, foreign borrowing at the sector level and foreign ownership at the firm level suggests that it is only domestic firms that get crowded out.

5. Digging Deeper: Why are domestic firms credit constrained?

Results of our analysis suggest that domestic firms are more credit constrained than foreign firms in the same sectors and that foreign firms crowd domestic firms out of capital markets. To better understand the reason for these differences between domestic and foreign firms we analyze financial ratios, debt structure and profitability. Results of this analysis are provided in Table 5.

5.1 Profitability Ratios

The first set of ratios in Table 5 measure return on equity and indicate that it is much higher in foreign firms than in domestic firms. Return on assets and asset turnover indicate how intensely the firm's assets are being put to use. The substantially higher ratios for foreign as compared to domestic firms indicate that foreign firms are indeed more profitable. In addition, the return on assets and asset turnover differences suggest that foreign firms are operating at or close to capacity and it may prove difficult to generate further business without additional investment.

5.2 Leverage Ratios

The next set of ratios in Table 5 are leverage ratios. The long-term debt to long-term debt plus equity ratio is significantly higher for domestic firms indicating that domestic firms are more highly leveraged than foreign firms. Long-term debt over equity is also significantly higher for foreign firms than for domestic firms. Hence, overall domestic firms are more highly leveraged than foreign firms.

5.3 Liquidity Ratios

The next three ratios are indicators of the firm's liquidity or how easily firms can meet debt payments in the short term. Two out of the three measures indicate that foreign firms are significantly more liquid than domestic firms.

5.4 Does higher profitability explain the impact of foreign investment?

$$RELPROF_Sector_{jt} = \frac{\frac{\sum_i REALPROFITS_{ijt} * DFI_Firm_{ijt}}{\sum_i REALSALES_{ijt} * DFI_Firm_{ijt}}}{\frac{\sum_i REALPROFITS_{ijt} * (1 - DFI_Firm_{ijt})}{\sum_i REALSALES_{ijt} * (1 - DFI_Firm_{ijt})}} \quad (8)$$

The profitability ratios in Table 5 highlight the possibility that foreign firms may crowd out domestic enterprises because they are simply more profitable. In Table 6, we test whether this is the case. We test for whether crowding out occurs as a result of the superior profitability of foreign firms by adding the interaction of firm cash flow with the sector-level relative profitability of foreign enterprises. We measure the profitability of foreign firms relative to the profitability of domestic firms by taking the ratio of the measure of the profitability of the foreign firm to the measure of profitability for the domestic firm. For example, we calculate the relative profit margin of foreign firms in the following way:

In addition to the relative profit margin, we compute the relative return on assets, and relative asset turnover. The addition of this interaction term does not affect our earlier results, indicating that relative profitability is not driving the results on crowding out. However, we do find that domestic firms in sectors where foreign firms are more profitable are more credit constrained. The coefficient on cash flow interacted with relative profitability of foreign firms is positive and significant if profitability is measured as relative return on assets. We conclude that relative

profitability may matter, but it is not driving our results on crowding out of domestic firms by foreign enterprises.

6. Welfare Implications

To properly account for the total impact of FDI on the host country, we would need to take into account the impact of foreign investment on domestic wages, profits, and employment; the role of foreign investors in promoting technology transfer; and the contribution of foreign investors to tax revenues. This is not addressed in this paper. However, we do compute the net impact of FDI on the availability of capital, adding together the inflows from equity purchases and foreign borrowing and subtracting the local borrowing of these firms.

The fact that foreign firms borrowed locally does not necessarily mean that the net impact of FDI on capital flows was negative. We also must consider the fact that foreign firms brought in equity. Table 7 shows the total amount borrowed by foreign firms and the total amount of equity brought in by foreign firms. In all years, the amount borrowed domestically substantially exceeds the equity contribution of foreign firms. Note that these figures understate the impact on capital flows due to foreign investment, as they do not account for repatriated profits and workers remittances. Table 7 indicates that because the majority of FDI was financed locally, FDI did not represent an increase in net capital flows to the economy. In fact, borrowing on local credit markets by foreign firms significantly exceeded the sum of equity purchases and foreign borrowing by these firms.

These negatives must be balanced against potential positives in order to obtain a complete picture of the welfare implications of the FDI. Beneficial effects of FDI include technology transfer, employee training and higher wages, and tax revenues. Table 7 indicates that foreign firms did contribute a significant amount to total tax revenues collected from the scope of this paper, this is the focus of research elsewhere (Branstetter and Feenstra (1999)). Branstetter and Feenstra analyze the welfare gains from the inflow of foreign investment into China, calculating

the implied weights in the social welfare function. However, they do not address the possibility that foreign investors could affect local credit markets, possibly crowding out domestic firms.

7. Conclusion

In this paper, we attempt to answer a question, which has not been addressed elsewhere: does the entry of foreign enterprises in developing country credit markets hurt their domestic competitors? Although foreign investment conveys benefits by bringing in scarce capital, those benefits may be mitigated if foreign enterprises crowd out domestic enterprises in the local credit markets. Our results suggest a difference between the credit constraints faced by domestic and foreign firms. In addition, we find that one major reason why domestic enterprises are more credit constrained than their foreign counterparts in the same sector is due to crowding out by foreign entrants. This crowding out effect is only present in the long-term debt markets. Further, we find that one contributing factor is that foreign firms are more profitable and more liquid. Hence, foreign firms might be a better investment for local banks than domestic firms. Nevertheless, our results remain even after we control for the higher profitability of foreign enterprises. In other words, even after controlling for the profitability of foreign firms, domestic enterprises are still “crowded out” by their foreign competitors.

We also examine the relative performance of public sector enterprises relative to their private sector counterparts. PSE’s do not exhibit the same correlation between investment and cash flow shown by other domestic enterprises. Nor is there any evidence that they are affected by foreign borrowing on domestic credit markets. These results suggest that PSEs are not credit constrained, perhaps because during this period they could be characterized by being subject to a soft budget constraint. In addition, PSEs are not crowded out by foreign enterprises of domestic credit markets, in contrast to their private sector counterparts.

We explore whether our results on crowding out could be due to unobserved factors, such as increased competition from foreign enterprises. We also explore whether the observed correlation between cash flow and investment could be explained by the fact that cash flow acts as

a predictor of future profitability, which then spurs investment. Preliminary results suggest that this is not the case.

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Table 1

Results of Testing for Credit Constraints and Crowding Out Using Euler Model

	Tests for "Crowding Out" or "Credit Rationing"							
	(1)	(2) Test		(3)		(4)		
	Basic Model	For Credit Constraints	Dom ¹	For ¹	Via Financial Sector	Dom	For	
Dependent Variable: Investment/Fixed Assets			Dom ¹	For ¹	Dom	For	Dom	For
<u>Explanatory Variables</u>								
Lagged (Investment/Fixed Assets)	0.301 (0.046)	0.239 (0.080)	0.307 (0.048)	0.440 (0.085)	0.285 (0.049)	0.443 (0.085)	0.278 (0.049)	
Lagged (Investment/Fixed Assets) Squared	-0.115	-0.051	-0.121	-0.179	-0.111	-0.180	-0.106	

User Cost of Capital ²	(0.037)	(0.078)	(0.039)	(0.072)	(0.038)	(0.072)	(0.038)
	-0.002	0.000	-0.002	0.001	-0.002	0.001	-0.003
	(.0001)	(0.002)	(.0001)	(0.002)	(.0001)	(0.002)	(.0001)
Lagged Cash Flow (CF)	0.019	0.041	0.020	0.029	0.041	0.051	0.048
	(0.003)	(0.007)	(0.003)	(0.019)	(0.009)	(0.022)	(0.011)
CF * Share Foreign LT borrowing				0.060	-0.016	0.064	-0.011
				(0.026)	(0.017)	(0.029)	(0.016)
Share Foreign LT borrowing				0.040	0.161	0.050	0.139
				(0.085)	(0.044)	(0.092)	(0.046)
CF * Share Foreign ST borrowing				-0.026	-0.011	-0.014	0.009
				(0.025)	(0.010)	(0.029)	(0.015)
Share Foreign ST borrowing				-0.073	-0.056	-0.059	-0.126
				(0.078)	(0.056)	(0.092)	(0.094)
CF * Share Foreign Sales						-0.053	-0.024
						(0.052)	(0.021)
Share Foreign Sales						0.004	0.113
						(0.121)	(0.094)
N	2403	2403		2317		2317	
R ²	0.29	0.29		0.30		0.30	

All specifications include year dummies and sector dummies. Standard errors in (). (1) In all specifications, domestic firms are those firms for which average foreign ownership over the life of the firm is less than or equal to 49%. All other firms are classified as domestic. (2) The user cost of capital is defined as the coefficient of variation on real profits relative to other firms in the same sector. (3) Results are robust to outliers using the dfbeta criterion.

Table 2

**Results of Testing for Credit Constraints and Crowding Out Using Euler Model
(with additional controls added for firm size and expected future profitability)**

	Tests for "Crowding Out" or "Credit Rationing"						
	(1)	(2) Test		(3)		(4)	
	Basic Model	For Credit Constraints	Via Financial Sector	Via Product Markets	Dom	For	Dom
Dependent Variable: Investment/Fixed Assets		Dom ¹	For ¹	Dom	For	Dom	For
<u>Explanatory Variables</u>							
Lagged (Investment/Fixed Assets)	0.303 (0.046)	0.393 (0.087)	0.274 (0.049)	0.426 (0.087)	0.293 (0.049)	0.426 (0.087)	0.286 (0.048)

Lagged (Investment/Fixed Assets) Squared	-0.127 (0.037)	-0.167 (0.077)	-0.112 (0.040)	-0.185 (0.074)	-0.127 (0.039)	-0.184 (0.074)	-0.122 (0.038)
Lagged Log of Sales (firm size)	-0.001 (0.000)	-0.004 (0.005)	-0.000 (0.005)	-0.001 (0.005)	-0.002 (0.005)	-0.000 (0.005)	-0.003 (0.005)
Lagged Real Sales Growth	0.151 (0.023)	0.106 (0.030)	0.161 (0.028)	0.115 (0.029)	0.160 (0.028)	0.112 (0.030)	0.159 (0.028)
User Cost of Capital ²	-0.003 (0.001)	0.001 (0.002)	-0.003 (.0001)	0.001 (0.002)	-0.004 (.0001)	0.001 (0.001)	-0.004 (.0001)
Lagged Cash Flow (CF)	0.021 (0.003)	0.041 (0.008)	0.020 (0.003)	0.027 (0.010)	0.044 (0.010)	0.037 (0.024)	0.049 (0.012)
CF * Share Foreign LT borrowing				0.066 (0.026)	-0.013 (0.017)	0.065 (0.028)	-0.009 (0.006)
Share Foreign LT borrowing				0.014 (0.082)	0.144 (0.044)	0.035 (0.092)	0.123 (0.046)
CF * Share Foreign ST borrowing				-0.021 (0.026)	-0.0156 (0.012)	-0.016 (0.028)	0.002 (0.015)
Share Foreign ST borrowing				-0.089 (0.085)	-0.037 (0.061)	-0.085 (0.091)	-0.104 (0.073)
CF * Share Foreign Sales						-0.021 (0.053)	-0.029 (0.020)
Share Foreign Sales						-0.052 (0.128)	0.107 (0.091)
N	2403	2403		2317		2317	
R ²	0.32	0.32		0.34		0.34	

All specifications include year dummies and sector dummies. Standard errors in (). (1) In all specifications, domestic firms are those firms for which average foreign ownership over the life of the firm is less than or equal to 49%. All other firms are classified as domestic. (2) The user cost of capital is defined as the coefficient of variation on real profits relative to other firms in the same sector. (3) Results are robust to outliers using the dfbeta criterion.

Table 3

**Results of Testing for Credit Constraints and Crowding Out Using Euler Model
(with additional controls added for firm profitability)**

Dependent Variable: Investment/Fixed Assets	Lagged Profit Margin ¹		Lagged Return on Assets ¹		Lagged Asset Turnover ¹	
	Dom	For	Dom	For	Dom	For
<u>Explanatory Variables</u>						
Lagged (Investment/Fixed Assets)	0.385 (0.087)	0.271 (0.049)	0.400 (0.089)	0.277 (0.049)	0.414 (0.081)	0.279 (0.048)
Lagged (Investment/Fixed Assets) Squared	-0.185 (0.065)	-0.126 (0.039)	-0.189 (0.066)	-0.129 (0.039)	-0.211 (0.062)	-0.120 (0.037)
Lagged Log of Sales (firm size)	-0.002 (0.005)	-0.004 (0.006)	-0.002 (0.005)	-0.004 (0.005)	-0.002 (0.005)	-0.002 (0.005)
Lagged Real Sales Growth	0.124	0.156	0.116	0.151	0.122	0.157

	(0.033)	(0.030)	(0.034)	(0.030)	(0.030)	(0.028)
User Cost of Capital ²	0.001	-0.003	0.001	-0.003	0.001	-0.005
	(0.001)	(.0001)	(0.001)	(.0001)	(0.001)	(.0001)
Lagged Cash Flow (CF)	0.040	0.047	0.043	0.049	0.055	0.030
	(0.025)	(0.012)	(0.024)	(0.012)	(0.020)	(0.014)
CF * Share Foreign LT borrowing	0.068	-0.009	0.067	-0.010	0.079	-0.015
	(0.028)	(0.007)	(0.027)	(0.007)	(0.031)	(0.017)
Share Foreign LT borrowing	-0.010	0.116	-0.001	0.119	-0.017	0.139
	(0.082)	(0.047)	(0.082)	(0.047)	(0.080)	(0.047)
CF * Share Foreign ST borrowing	-0.023	-0.001	-0.010	-0.002	-0.008	0.008
	(0.026)	(0.015)	(0.029)	(0.015)	(0.030)	(0.016)
Share Foreign ST borrowing	-0.031	-0.111	-0.031	-0.106	-0.052	-0.125
	(0.084)	(0.095)	(0.085)	(0.075)	(0.085)	(0.075)
CF * Share Foreign Sales	-0.024	-0.024	-0.029	-0.024	-0.043	-0.015
	(0.054)	(0.019)	(0.054)	(0.019)	(0.055)	(0.023)
Share Foreign Sales	-0.018	0.128	-0.041	0.130	0.001	0.066
	(0.135)	(0.091)	(0.133)	(0.091)	(0.129)	(0.095)
Profitability Measures	0.076	0.167	-0.020	0.018	0.023	0.008
	(0.032)	(0.043)	(0.023)	(0.014)	(0.006)	(0.002)
N	2130		2130		2316	
R ²	0.34		0.33		0.35	

All specifications include year dummies and sector dummies. Standard errors in (). (1) Profit margin is defined as the ratio of real profits to real sales, return on assets is defined as the ratio of real profits to real assets and asset turnover is defined as the ratio of real sales to real assets. (2) The user cost of capital is defined as the coefficient of variation on real profits relative to other firms in the same sector. (3) Results are robust to outliers using the dfbeta criterion.

Table 4

**Results of Testing for Credit Constraints and Crowding Out Using Euler Model
(with Domestic Firms Broken Down into Public and Private)**

Dep.Variable: Inv./Fixed Assets	Tests for "Crowding Out" or "Credit Rationing"								
	Test For Credit Constraints			Via Financial Sector			Via Product Markets		
	D ¹	F ¹		D	F		D	F	
	Public	Private		Public	Private		Public	Private	
<u>Explanatory Variables</u>									

Lagged (Inv./Fixed Assets)	0.503 (0.242)	0.109 (0.067)	0.274 (0.049)	0.677 (0.193)	0.122 (0.067)	0.293 (0.049)	0.565 (0.209)	0.116 (0.068)	0.286 (0.048)
(Lagged Inv./Fixed Assets) Sq.	-0.360 (0.226)	-0.114 (0.031)	-0.112 (0.040)	-0.725 (0.183)	-0.113 (0.032)	-0.127 (0.039)	-0.559 (0.237)	-0.117 (0.032)	-0.122 (0.038)
Lagged Log of Sales (firm size)	-0.007 (0.003)	-0.008 (0.002)	-0.000 (0.005)	-0.010 (0.003)	-0.005 (0.003)	-0.002 (0.005)	-0.008 (0.002)	-0.001 (0.005)	-0.003 (0.005)
Lagged Real Sales Growth	0.017 (0.084)	0.126 (0.034)	0.161 (0.028)	0.099 (0.075)	0.130 (0.034)	0.160 (0.028)	0.092 (0.076)	0.138 (0.035)	0.159 (0.028)
User Cost of Capital ²	-0.008 (0.007)	-0.001 (0.001)	-0.003 (.0001)	-0.008 (0.009)	-0.001 (0.001)	-0.004 (.0001)	-0.008 (0.007)	-0.001 (0.001)	-0.004 (.0001)
Lagged Cash Flow (CF)	0.035 (0.031)	0.036 (0.008)	0.020 (0.003)	0.005 (0.056)	0.021 (0.011)	0.044 (0.010)	-0.022 (0.070)	0.032 (0.015)	0.049 (0.012)
CF * Share For. LT borrowing				-0.282 (0.192)	0.071 (0.029)	-0.013 (0.017)	-0.385 (0.327)	0.055 (0.020)	-0.009 (0.006)
Share For. LT borrowing				0.206 (0.143)	-0.047 (0.099)	0.144 (0.044)	0.350 (0.199)	0.000 (0.103)	0.123 (0.046)
CF * Share For. ST borrowing				0.525 (0.449)	-0.036 (0.031)	-0.0156 (0.012)	0.301 (0.203)	-0.078 (0.066)	0.002 (0.015)
Share For. ST borrowing				-0.246 (0.171)	-0.051 (0.119)	-0.037 (0.061)	-0.179 (0.186)	0.098 (0.139)	-0.104 (0.073)
CF * Share For. Sales							0.388 (0.319)	0.104 (0.155)	-0.029 (0.020)
Share For. Sales							-0.253 (0.261)	-0.293 (0.182)	0.107 (0.091)
N		2403			2317			2317	
R ²		0.32			0.33			0.33	

All specifications include year dummies and sector dummies. Standard errors in (). (1) In all specifications, domestic firms are those firms for which average foreign ownership over the life of the firm is less than or equal to 49%. All other firms are classified as domestic. (2) The user cost of capital is defined as the coefficient of variation on real profits relative to other firms in the same sector. (3) Results are robust to outliers using the dfbeta criterion.

Table 5

**Why Do Domestic Firms Get Crowded Out?
A Comparison of Financial Ratios**

Variable	N	Mean Domestic	Mean Foreign	t-statistic for change in Mean

I. Profitability Ratios¹

Profit Margin	2264	-0.021	0.031	3.061
Return on Assets	2471	0.083	0.114	4.375
Asset Turnover	2471	4.834	7.667	4.756

II. Leverage Ratios

Long-term Debt/ (Long-term Debt + Equity)	2446	0.369	0.332	2.161
Long-term Debt/ Equity	2446	11.628	1.075	4.965

III. Liquidity Ratios

Operating Cash Flow/Interest Costs	2218	5.370	8.796	2.317
Operating Cash Flow/Short-term Debt	1708	2.529	3.008	1.969
Operating Cash Flow/Total Debt	2446	8.076	7.684	1.734

Results were obtained by regressing ratios on a dummy variable for ownership and a constant. (1) Profit margin is defined as the ratio of real profits to real sales, return on assets is defined as the ratio of real profits to real assets and asset turnover is defined as the ratio of real sales to real assets.

Table 6

Can Differences in Relative Profitability Explain the Results?

Dependent Variable: Investment/Fixed Assets	Relative Profit Margin ¹		Relative Return on Assets ¹		Relative Asset Turnover ¹	
	Dom	For	Dom	For	Dom	For

<u>Explanatory Variables</u>						
Lagged (Investment/Fixed Assets)	0.436 (0.088)	0.278 (0.056)	0.444 (0.088)	0.276 (0.056)	0.395 (0.087)	0.278 (0.056)
Lagged (Investment/Fixed Assets) Squared	-0.192 (0.074)	-0.109 (0.047)	-0.195 (0.074)	-0.108 (0.047)	-0.160 (0.074)	-0.108 (0.047)
Lagged Log of Sales (firm size)	-0.001 (0.005)	-0.003 (0.005)	-0.002 (0.005)	-0.003 (0.005)	-0.000 (0.005)	-0.003 (0.005)
Lagged Real Sales Growth	0.122 (0.031)	0.160 (0.029)	0.124 (0.030)	0.159 (0.029)	0.119 (0.031)	0.162 (0.028)
User Cost of Capital ²	0.000 (0.002)	-0.003 (.0001)	0.001 (0.002)	-0.005 (.0001)	0.001 (0.001)	-0.005 (.0001)
Lagged Cash Flow (CF)	0.043 (0.024)	0.043 (0.012)	0.061 (0.026)	0.046 (0.014)	0.031 (0.015)	0.450 (0.012)
CF * Share Foreign LT borrowing	0.075 (0.031)	-0.007 (0.007)	0.077 (0.030)	-0.007 (0.007)	0.054 (0.028)	-0.006 (0.007)
Share Foreign LT borrowing	0.030 (0.094)	0.133 (0.049)	0.016 (0.096)	0.134 (0.049)	0.097 (0.101)	0.094 (0.049)
CF * Share Foreign ST borrowing	0.016 (0.043)	0.002 (0.016)	0.064 (0.049)	0.008 (0.018)	-0.015 (0.027)	-0.000 (0.015)
Share Foreign ST borrowing	-0.086 (0.094)	-0.113 (0.077)	-0.150 (0.095)	-0.131 (0.079)	-0.024 (0.089)	-0.124 (0.073)
CF * Share Foreign Sales	-0.066 (0.072)	-0.021 (0.022)	-0.124 (0.076)	-0.032 (0.027)	0.007 (0.054)	-0.021 (0.020)
Share Foreign Sales	-0.021 (0.137)	0.079 (0.094)	0.067 (0.143)	0.108 (0.100)	-0.162 (0.138)	0.160 (0.094)
CF * Relative Profitability Measures	0.190 (0.153)	0.007 (0.023)	0.020 (0.009)	0.004 (0.005)	-0.002 (0.001)	-0.000 (0.000)
Relative Measures of Profitability	-0.133 (0.144)	0.027 (0.070)	-0.022 (0.037)	0.001 (0.020)	0.014 (0.008)	-0.003 (0.002)
N	2251		2251		2251	
R ²	0.34		0.34		0.34	

All specifications include year dummies and sector dummies. Standard errors in (). (1) Profit margin is defined as the ratio of real profits to real sales, return on assets is defined as the ratio of real profits to real assets and asset turnover is defined as the ratio of real sales to real assets. To obtain the relative profitability of foreign firms compared to domestic firms, we calculate the average profitability of foreign firms by sector and by year and compare this with the average profitability of domestic firms in the same sector and year by computing the ratio of foreign to domestic. (2) The user cost of capital is defined as the coefficient of variation on real profits relative to other firms in the same sector. (3) Results are robust to outliers using the dfbeta criterion.

Table 7 - Welfare Implications

Year	Foreign Tax /Total Tax	Foreign Tax /Foreign Sales	Total Foreign Borrowing (bn. cfa francs)	Total Foreign Equity (bn. cfa francs)	Foreign Equity/Foreign Borrowing
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75	79.03%	17.63%	44.00	26.70	60.68%
76	81.87%	19.14%	64.00	33.10	51.72%
77	78.27%	23.48%	79.70	33.20	41.66%
78	75.60%	26.01%	112.00	37.40	33.39%
79	75.10%	27.62%	136.00	42.60	31.32%
80	75.67%	30.00%	162.00	50.40	31.11%
81	74.72%	31.46%	169.00	52.80	31.24%
82	74.34%	33.97%	181.00	56.40	31.16%
83	72.00%	34.43%	208.00	59.40	28.56%
84	74.91%	40.93%	199.00	65.40	32.86%
85	74.52%	42.19%	195.00	61.10	31.33%
86	71.03%	42.74%	204.00	66.00	32.35%
87	65.63%	39.44%	185.00	63.70	34.43%

Table A.1

Origin of Long Term Borrowing by Foreign Firms in 1985
(millions of cfa francs)

Sector	Total Borrowing	Amount Borrowed Abroad ^a	Percent Borrowed Abroad
Food	15,315	2,031	13.26
Textiles & Clothing	5,610	596	10.62
Leather Products	559	52	9.30
Wood Products	7,380	839	11.37
Chemicals	6,820	687	10.07
Rubber & Cement	4,610	167	3.62
Building Materials	1,160	177	15.26
Transportation Materials	3,690	1,867	50.60
Tools	3,870	262	6.93
Paper Products	3,420	45	1.32
Total	52,344	6,723	

Table A.2

Ownership Structure by Sector

Sector	No. Firms	Domestic Public	Domestic Private	Foreign
Food – Coffee	37	2.72%	44.69%	52.44%
Food – Condiments	16	16.14%	14.40%	69.46%
Food – Beverages	6	0%	18.33%	81.67%
Food – Cooking Oils	5	32.63%	11.81%	55.56%
Food – Sugar	9	8.45%	12.32%	79.22%
Textiles & Clothing	28	11.15%	17.08%	71.60%
Leather Products	8	0%	6.89%	93.12%
Wood Products	46	0.28%	25.89%	73.49%
Chemicals	44	4.40%	13.61%	82.00%
Rubber & Cement	6	20.42%	19.31%	60.27%
Building Materials	12	7.77%	24.03%	68.20%
Transportation Materials	33	0.61%	2.25%	97.14%
Tools	59	3.32%	13.25%	83.43%
Paper Products	32	8.70%	24.16%	67.14%
Total	341			

Table A.3

Overall Composition of Debt by Ownership (1975 – 1987)

Debt Type	Domestic Public	Domestic Private	Foreign
Long-term Debt	0.47	0.39	0.29
Short-term Debt	0.53	0.61	0.71
Of which:			
Suppliers Credits	0.12	0.21	0.28
Bank Debt	0.23	0.20	0.21
Public Debt	0.12	0.09	0.11

Table A.4

Descriptive Statistics of Variables Used in Analyses

Variable	Number of Observations	Mean	Standard Deviation
Public Ownership	2721	0.06	0.16
Private Ownership	2721	0.19	0.31
Foreign Ownership	2721	0.75	0.33
Investment/Capital Stock	2721	0.32	0.29
Log of Real Sales	2721	19.92	1.43
Operating Cash Flow/Capital Stock	2721	2.82	3.93
Share of Foreign LT Borrowing in Sector j Year t	2649	0.69	0.25
Share of Foreign ST Borrowing in Sector (SC)	2719	0.74	0.22
Share of Foreign ST Borrowing in Sector (BC)	2680	0.72	0.23
Share of Foreign Public Borrowing in Sector	2721	0.72	0.23
Share of Foreign Sales	2721	0.75	0.20

SC stand for suppliers credits and BC bank credits.

Table A.5
Borrowing & Sales By Ownership

Year	Borrowing			Sales		
	Public/Total	Private/Total	Foreign/Total	Public/Total	Private/Total	Foreign/Total
1975	17.16%	6.52%	76.32%	12.03%	4.82%	83.15%
1976	23.30%	6.12%	70.58%	16.73%	4.61%	78.65%
1977	9.56%	7.86%	82.59%	7.81%	5.91%	86.29%
1978	17.70%	7.11%	75.19%	12.37%	5.46%	82.17%
1979	33.42%	8.67%	57.91%	20.14%	6.08%	73.78%
1980	31.56%	8.13%	60.32%	18.37%	6.82%	74.80%
1981	32.10%	8.64%	59.26%	18.01%	8.03%	73.96%
1982	30.67%	9.17%	60.16%	17.41%	7.26%	75.32%
1983	29.08%	7.58%	63.33%	20.06%	6.20%	73.74%
1984	30.40%	7.10%	62.50%	25.10%	6.09%	68.81%
1985	32.57%	6.26%	61.17%	23.84%	6.11%	70.06%
1986	28.44%	6.41%	65.15%	19.30%	5.85%	74.85%
1987	32.95%	6.17%	60.89%	22.92%	6.98%	70.10%