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Financial Constraints on Investment in an Emerging Market Crisis: An Empirical Investigation of Foreign Ownership[*]

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Abstract

We investigate whether capital market imperfections constrain investment during an emerging market financial crisis. Both large currency devaluations and widespread collapse of the banking sector characterize recent crises. Although a currency devaluation should increase exporters' competitiveness and investment, a failing banking system may limit credit to these firms. Foreign-owned firms, which have greater access to overseas financing but otherwise face the same investment prospects, provide an ideal control group for determining the effect of liquidity constraints. We test for liquidity constraints in Indonesia following the 1997 East Asian financial crisis, a period when the issuance of new domestic credit shrank declined rapidly. Exporters' value added and employment increased after the crisis, suggesting that they profited from the devaluation and had sufficient cash flow to finance more workers. However, only exporters with foreign ownership increased their investment significantly. The failure of domestic firms to invest under profitable conditions suggests that they may have faced liquidity constraints. Investment by foreign-owned firms increased post-crisis capital stock by about 4% more than would have occurred if all the firms were domestically owned.

Keywords: Liquidity Constraints, Foreign Direct Investment, Financial Crisis, Indonesia

J.E.L. codes: O16, F23, E32, O12

1. Introduction

Do capital market imperfections constrain investment during emerging market financial crises? A consequence of crises, such as those that have occurred recently in East Asia, Latin America, and Russia, is both a dramatic currency devaluation and a crippling decline of the banking sector. These two events have opposing effects on new investment in the tradable goods sector. Whereas net exporting firms should benefit from better terms of trade and thus seek to increase be able to increase their investments,, the collapse of the banking sector may limit their access to needed credit. Although changes in the terms of trade affect firms equally, ceteris paribus, the degree to which liquidity constraints limit their activities likely varies by firms' ownership. In particular, firms with foreign ownership can overcome liquidity constraints by accessing overseas credit through their parent companies. Comparing investment by domestically owned firms with investment by a control group of foreign-owned firms is thus an ideal test of the extent to which capital market imperfections limit investment. We conduct this test using a panel dataset of Indonesian manufacturing establishments before and after the East Asian financial crisis of 1997-1998. Our results show that foreign-owned exporters increased investment during the crisis, but otherwise similar domestically owned exporters did not.

The imperfections of capital markets and liquidity constraints are well documented (Fazzari, Hubbard, and Petersen 1988, Bernanke and Gertler 1989, Hoshi, Kashyap, and Scharfstein 1991, and Minton and Schrand 1999; see surveys by Hubbard 1998 and Caballero and Krishnamurthy 1999). The insight of this work is that some firms have easy access to capital and thus their investment responds to future profit opportunities. Other firms have only limited access to capital, and thus their investment responds to current cash flow more than to future profit opportunities.

Recent theoretical work, such as Caballero and Krishnamurthy 2001, demonstrates that such capital market imperfections can amplify the severity of financial crises.[1] Aguiar and Gopinath 2005 and Desai, Foley, and Forbes 2004 have examined the empirical predictions using domestic and foreign ownership to identify firms at high and low risk of liquidity constraints. Aguiar and Gopinath 2005 examines mergers and acquisitions during crises and finds that a decline in liquidity leads to an increase in M&A activity at "fire sale" prices. Desai, Foley, and Forbes 2004 finds that U.S. firms significantly increase investment in overseas operations following a currency devaluation, while local firms often do not. We follow a similar empirical approach and show that domestically owned and foreign-owned exporters in Indonesia responded to the crisis in very different ways consistent with the presence of liquidity constraints.

The unprecedented scale of Indonesia's currency devaluation and the severity of its banking sector's troubles provide a unique setting for our study. The East Asian financial crisis had a devastating effect on the Indonesian economy. The official measure of GDP dropped 13% in 1998, and investment fell 45% percent in 1998 alone, followed by a smaller decline in 1999. Some of this devastation is surprising since the financial crisis was associated with the largest real devaluation in recent history. A U.S. dollar could buy four to six times the volume of Indonesian exports in early 1998 as in mid-1997. Although rapid Indonesian inflation eliminated roughly half the nominal devaluation, a 2:1 real devaluation remains almost unprecedented. With this large a change in the terms of trade, conventional trade theory suggests that Indonesian firms should have enjoyed an export boom.

Nonetheless, this event was not known as a currency crisis, but as a financial crisis (*krismon*, or monetary crisis, in Indonesia). Most banks in the nation were insolvent

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[1]See Aguiar 2002, Forbes 2002, and Reinhart and Calvo 2000 for discussion of the effect of financial crises on emerging market firms in tradable and non-tradable sectors.

by 1998. The press reported that many firms, even those that wanted to export, were unable to access capital. Lenders had difficulty distinguishing between insolvent borrowers—for whom new loans would go toward old loan repayment rather than productive new investments—and firms that legitimately needed funds for ongoing operations or attractive investments. Moreover, even if a lender could identify solvent firms, IMF banking reforms may have reduced many banks' willingness to make *any* loans. Under threat of closure if they could not meet the IMF's higher reserve requirements, in the short run banks may have preferred holding cash over granting even highly profitable loans.

Our results show that these problems were less severe at plants with foreign owners, who presumably had access to the plants' accounts and could confirm the desirability of new investment and monitor where the money went. Foreign owners, particularly large multinationals, could finance their Indonesian factories internally or through lines of credit available to the parent company.

Our study adds to the literature on foreign direct investment (FDI) during crises (e.g., Lipsey 2001) and to the debate on the social benefits of FDI versus local investment (e.g., Aitken and Harrison 1999). In the case of Indonesia, a simple "back-of-the-envelope" estimate shows that the benefits of FDI were substantial. Prior to the crisis, foreign firms owned approximately 20% of the total capital stock of exporters, and that capital increased about 18% more than domestic capital. Thus foreign-owned firms added roughly 4% more to the post-crisis capital stock than would have been the case if all firms had been domestically owned.

We proceed as follows. Section 2 provides some background on Indonesia and the financial crisis. Section 3 discusses the theory that motivates our analysis, and Section 4 introduces our data and methods. Section 5 presents our results, and Section 6 concludes.

2. Indonesia Background

In 1967, when President Suharto took power, Indonesia was widely considered one of the developing world's basket cases. GDP per capita, for example, was only half that of India, Bangladesh, or Nigeria. By 1997, in contrast, Indonesia was known as one of the Tiger Cubs. Its GDP per capita was at least 3.5 times that of India, Bangladesh, or Nigeria.

Although oil and other natural resources played a role, much of the GDP growth was led by export-oriented manufacturing. Starting from a very low base in 1980, manufacturing boomed through the mid-1990's. In contrast to the first years of Suharto's "New Order" regime of the 1960's and 1970's, much of the manufacturing was either foreign-owned or export-oriented, or both.

Starting in August 1997, Indonesia, like other nations severely affected by the Asian financial crisis, experienced a sudden and widespread financial panic. By January 1998, the Indonesian rupiah (Rp) was worth 15% of its dollar value six months earlier, and GDP growth fell from +8% in 1996 to -13% in 1998. Austerity measures, inflation, very high interest rates, and a massive credit crunch brought the crisis from the financial sector to manufacturing plants. Table 1 lays out a timeline of the crisis.

3. Theory

We first review what conventional trade theory predicts should follow from a massive real devaluation. We then discuss theories of investment subject to financial constraints, a set of theories that are likely applicable during a financial crisis. We close this section with a discussion of how foreign ownership might mitigate financial constraints and increase the accuracy of trade theory predictions.

3.1. Trade Theory

Conventional trade theory assumes that relative prices are important, and no price is more important than the relative price of currency—the real exchange rate. When a country's currency undergoes a real devaluation, its exports become more competitive. In addition, domestic producers that compete against imported goods become more competitive. These increases in competitiveness should have several testable implications: higher profits, more employment, and increased investment. A number of studies, such as Aguiar 2002, demonstrate such findings using firm-level data.In contrast, firms that import most of their raw and intermediate goods to sell locally become less competitive.

Trade theory predicts that the expansionary effect of devaluation will be muted if competitors also undergo devaluations. Thailand and Malaysia, for example, also devalued around the same time as Indonesia, and China had experienced a large devaluation shortly before. Because those real devaluations were much smaller than Indonesia's, standard theory still predicts higher net exports for Indonesia.

In fact, the U.S. dollar value of manufactured exports rose only slightly, from $50 billion in 1996-1997 to $53 billion in 1999 (International Monetary Fund 2000, Table 42).But although exports were roughly flat in dollar terms and (presumably) in quantity terms, their value roughly doubled in inflation-adjusted rupiah terms, assuming the relative price of exports remained unchanged.

3.2. Financial Constraints

Why didn't the dollar value of manufacturing exports increase? One reason may have been the poor state of the banking industry.

Any economic downturn increases banks' lending risk because more of their ex-

isting and potential customers are near bankruptcy. Indonesia's notorious lack of financial transparency and weak bankruptcy laws amplified this effect because banks were unable to verify which customers were still solvent. Loans to insolvent customers were unlikely ever to be repaid.

In addition, after the financial crisis banks stated that they preferred to lend to customers with whom they had an ongoing relationship (Agung, Kusmiarso, Pramono, Hutapea, Prasmuko, and Prastowo 2001). As numerous banks closed down during and after the financial crisis, relationship-specific ties were broken and some creditworthy firms may have lost access to credit.

As the crisis continued, Indonesia established new regulatory mechanisms that forced most banks to recognize their underperforming loans (Enoch, Baldwin, Frecaut, and Kovanen 2001). The resulting extremely low capital ratios in banks further discouraged lending.

The outcome of the lower demand for and supply of credit was dramatic. Between 1996 and 2000, the real value of credit from commercial banks to the manufacturing sector fell by roughly half (comparing International Monetary Fund 2000, Table 35 on credit, with the earlier tables on WPI and CPI). Presumably credit from foreign sources fell even faster as foreign capital poured out of Indonesia during the crisis.

Although much of this decline in total credit may have been attributable to lower demand, constraints on credit supply by banks could nonetheless reduce investment by potentially creditworthy borrowers. Indeed, analyzing surveys of banks and of manufacturing plants, Agung, Kusmiarso, Pramono, Hutapea, Prasmuko, and Prastowo (2001) concluded that lack of bank capital (not high borrower risk) was responsible for much of the slowdown in lending.

3.3. Foreign Ownership and Financial Constraints

Above we argued that domestic banks may be unwilling to lend to firms if the banks cannot determine which firms are essentially bankrupt and unlikely to produce their way out of their problems. An Indonesian plant with substantial foreign ownership should not have this problem, because the foreign owner can document the solvency and profitability of the plant. Indeed, evidence suggests that foreign affiliates often substitute internal borrowing for external borrowing when operating in environments with poorly developed financial markets (Desai, Foley, and Hines 2003).

For firms that sell primarily to the domestic market and do not compete with imports, the benefits of foreign ownership may be low because a foreign owner would not be inclined to invest in a firm selling to the depressed Indonesian market. The hypothesis of foreign ownership as an antidote to financial crisis should be most visible for firms that export or compete with imports.

Three forces mitigate this hypothesis. First, some assembly plants import most of the value of sales. Even so, a devaluation greatly reduces the cost of labor—the main cost as a share of value added. To the extent that the percentage of imports and exports is exogenous, standard trade theory suggests that the share of net exports (that is, exports minus imports) in sales should matter more than the export share in predicting desired expansion after a devaluation and financial crisis.

Second, the Indonesian financial crisis was accompanied by an increase in political risk. Foreign firms might have considered the weaker currency insufficient to counteract the risks of large capital losses. Risk-averse managers in particular might have been loath to invest in Indonesia if they feared the failing economy would erode the basic infrastructure,cause a civil war to break out, or lead to another catastrophic event that would depreciate assets. Riots in opposition to IMF programs presumably

led all foreigners to fear for their personal safety and that of their assets.

Although plausible, it is not clear why rising political risk should have affected foreign owners more than it did many domestic investors. A substantial majority of Indonesia's large companies were owned by individuals closely associated with Suharto (Fisman 2001), by the ethnic Chinese minority in Indonesia, or by businesspeople who were both. These groups had strong reasons to fear that either a new government would take over their businesses or a mob would destroy them. Their risks may have been larger than those faced by foreign investors.

Finally, firms with foreign equity ownership, as well as those that exported, might disproportionately have been those with foreign debt. The devaluation vastly increased the rupiah cost of servicing debt denominated in dollars, yen, or other hard currencies.

4. Data and Methods

4.1. Data

The analysis is based on data from the Republic of Indonesia's *Budan Pusat Statistik* (BPS), the Central Bureau of Statistics. The principal dataset is the *Survei Tahunan Perusahaan Industri Pengolahan* (SI), the Annual Manufacturing Survey. The SI dataset is designed to be a complete annual enumeration of all manufacturing establishments with 20 or more employees from 1975 onward. The SI includes industrial classification (5-digit ISIC), ownership (public, private, foreign), capital, labor, raw material use, export volume, and other related data. We use data from 1990 to 2000. Because of the rapid rupiah devaluation during the crisis, a difference of just a few weeks in the reporting date could dramatically affect values. To avoid this bias, the estimation admits only the pre- and post-crisis years and drops 1996 to 1998.

BPS submits a questionnaire annually to all registered manufacturing establishments, and field agents attempt to visit each non-respondent to either encourage compliance or confirm that the establishment has ceased operation.[2] In recent years, over 20,000 factories have been surveyed annually. Government laws guarantee that the collected information will only be used for statistical purposes. However, several BPS officials commented that some establishments intentionally misreport financial information out of concern that tax authorities or competitors may gain access to the data. Because the fixed-effect analysis admits only within-factory variation on a logarithmic scale, errors of under- or over-reporting will not bias the results as long as each factory consistently misreports over time. Further, even if the degree of misreporting for a factory varies over time, the results will be unbiased if the misreporting is not correlated with other factory attributes in the right-hand side of the regression.

We have varying degrees of confidence in the validity of the three survey responses we examine: number of employees, valued added, and capital stock. Employment appears to be the most likely variable to be reported with high validity. Value added depends very much on the deflators, which are almost certainly noisy measures of true prices. At the same time, our methodology employs a "differences in differences" approach, so overall mismeasurement of inflation will be differenced out. The value of the capital stock is, as usual, the most difficult to measure. In a macroeconomic crisis with high inflation, book value, market value, and replacement cost of assets can diverge widely. It is unclear which plants used which concept to describe their asset values. Thus, while our differencing procedure will eliminate systematic errors, caution is important when considering changes in the capital stock (even with the

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[2]Some firms may have more than one factory. BPS also submits a different questionnaire to the head office of every firm with more than one factory. Although these data were not available for this study, analysis by BPS suggests that less than 5% of factories belong to multi-factory firms. We therefore generalize the results to firms.

inclusion of plant and year fixed effects). We deflated the value-added figures by the 5-digit ISIC industry wholesale price index, and the capital figures by an average of machine, vehicle, and land price indexes, weighted by the share each asset represents of the economy-wide capital stock.

We have two measures of leverage (debt-to-assets ratio), each with limitations. The first indicator is of the leverage in current rupiah. Unfortunately, the dataset does not distinguish zero debt from missing values for the debt measure. Thus we analyze this variable carefully, examining only observations with non-zero debt levels.[3] The second indicator is the existence of a loan from a foreign bank. This measure does not tell us the denomination of the debt, although other sources indicate that most foreign debt was in U.S. dollars (Blustein 2001). Even more important, this measure also does not indicate the share of debt denominated in foreign currency. Thus we distinguish leverage between establishments with and without any foreign bank loans, but we cannot examine the effects of changing shares of foreign-currency-denominated debt.

4.2. Methods

Our methodology is two-fold. First, we compare the effect of the crisis on wholly Indonesian-owned establishments, both exporters and non-exporters. Our aim is to establish exporters as beneficiaries of the rupiah devaluation. Second, we compare the post-crisis outcomes of Indonesian-owned exporters and foreign-owned exporters. The identifying assumption is that the rupiah devaluation should have affected foreign and domestic exporters in the same manner, all else being equal. We argue that changes in investment patterns between foreign and domestic exporters, relative to their pre-

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[3]The results are unchanged if zero-debt responses are assumed to indicate no debt rather than a missing value.

crisis trends, could result from their different financing sources. Whereas domestic establishments would have to either borrow from domestic banks struggling with insolvency or convince foreign banks of their creditworthiness, foreign establishments could obtain internal credit through their parent companies.

As discussed above, exporters and foreign factories were more likely to have had debts denominated in U.S. dollars, Japanese yen, and other hard currencies than in rupiah. In fact, because the Bank of Indonesia has historically supported a policy of gradual depreciation of the rupiah against the dollar, many firms had borrowed abroad to take advantage of lower interest rates. With the implicit belief that the exchange rate would not change dramatically in the short run, few firms had hedged their positions (Blustein 2001). In many cases, the change in the value of outstanding debt alone left firms insolvent following the devaluation. In contrast, those with loans in rupiah enjoyed a large discount in the cost of repaying their debt. We will use our rough measures of liquidity described above as a control in some estimations.

Equation 1 estimates the effect of the crisis on firm outcomes.

$$
\begin{aligned}
\ln Outcome_{it} = &\beta_0 (Exporter * Post)_{it} + \beta_1 (Foreign\_Leverage * Post)_{it} + \\
&\beta_2 (Domestic\_Leverage * Post)_{it} + \alpha_i + \gamma_t + \varepsilon_{it}
\end{aligned}
\tag{1}
$$

where $Outcome_{it}$ is the log of value added, the log of labor, and the log of capital in the respective specifications, $(Exporter * Post)_{it}$ is the interaction of indicators for a pre-crisis (anytime during 1993 to 1995) exporting establishment i and post-crisis years (1999-2000), $(Foreign\_Leverage * Post)_{it}$ and $(Domestic\_Leverage * Post)_{it}$ are the interactions of foreign and domestic leverage, respectively, and post-crisis years, α_i is a fixed effect for factory i, and γ_t is a dummy variable for year t. We note again that we intentionally do not use data from 1996 to 1998. Capital data are not

available for 1996, and the rapid inflation and devaluation of the rupiah during 1997-1998 make any interpolation of pecuniary terms difficult, if not impossible. By 1999 the currency had stabilized, and we believe that variance in monetary values reflects true firm heterogeneity rather than spurious noise resulting from volatile exchange rates.

Each of the three outcome measures captures different responses to the crisis. Value added should mirror profitability and reflect the overall effect of the devaluation. That is, exporting establishments with domestic materials should see value added rise even with no other changes in production. We expect labor to also reflect the overall effect of the devaluation, but subject to access to short-term working capital. Last, capital should reflect the expected persistent effect of the devaluation subject to access to long-term finance.

We next estimate Equation 1 for just exporting establishments and substitute $(Foreign * Post)_{it}$ for $(Exporter * Post)_{it}$.

$$\ln Outcome_{it} = \beta_0(Foreign * Post)_{it} + \beta_1(Foreign\_Leverage * Post)_{it} + \\ \beta_2(Domestic\_Leverage * Post)_{it} + \alpha_i + \gamma_t + \varepsilon_{it} \tag{2}$$

where $Foreign$ is an indicator for plants with foreign equity in 1993-1995.

It is important to note that the estimation uses only within-plant estimation. Time-invariant attributes of the factory, such as its management, industry, and location, are all removed by the fixed effect. Equation 1 thus asks how the difference between domestic exporters and non-exporters changed after the crisis, *conditional on all the unobserved static characteristics of the factories.* Likewise, Equation 2 asks how the difference between foreign and domestic exporters changed after the crisis, again controlling for plant unobservables.

As we noted above, capital is notoriously difficult to deal with in empirical studies of firms. One can imagine wide variation in the valuation of capital assets following the financial crisis. The advantage of our "differences in differences" approach is that we do not rely on changes in the absolute levels of capital. Rather, we ask how differences in capital changed before and after the crisis. Provided that changes in valuation are consistent across asset types, our estimates are consistent.

Finally, to better ensure the comparability of both the domestic exporters and non-exporters and the domestic and foreign exporters, we have limited our sample in two ways. First, we consider only factories with more than 100 employees. Smaller firms in Indonesia are unlikely to have access to formal credit markets and overseas buyers. Second, we consider only plants in industry-region cells for which there is at least one domestic exporter and one foreign exporter.

5. Results

5.1. Summary Statistics

We first examine the characteristics of foreign-owned versus domestically owned plants and of exporting and non-exporting plants prior to the financial crisis (Table 2). We define foreign factories as those that had foreign equity anytime from 1993 to 1995 and exporters as those that exported anytime from 1993 to 1995.

Fourteen percent of all factories were foreign-owned. Roughly two-fifths of domestic plants and two-thirds of foreign-owned plants were exporters.

Foreign-owned plants were larger than domestic plants (mean 600 versus 478 employees), although most of this gap was due to the fact that exporters were larger than non-exporters. Among exporters, foreign-owned plants had fewer employees than their domestically owned counterparts. Foreign-owned plants were far more

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capital-intensive than domestically owned plants, although half that gap was erased when comparing foreign-owned plants only with other exporters.

About one-fifth of domestically owned non-exporters did not survive until 2000. The survival rate was higher for domestically own exporters (83%)and foreign- owned plants (87%).

Plants' exporting activities were fairly persistent, but less so than we had expected. Among exporters in 1993-1995 who survived until 1999-2000, only about 59% (foreign-owned) to 60% (domestically owned) were still exporting at the later dates, a rate of exit from export markets much higher than that in pre-crisis years. Similarly, only 14% of non-exporters switched to exporting, although the rate of initiating exports was substantially higher among foreign-owned non-exporters (21%). Sjoholm and Takii (2003) also report that during the 1990s plants with foreign ownership in Indonesia had above-average odds of starting to export, an effect they attributed to social networks that lowered the costs of starting to export.

As noted above, our leverage measures have several problems: we cannot distinguish zero debt from missing values for debt, and we know only whether any debt is foreign-currency-denominated, but not how much. With these cautions in mind, for plants with positive reported debt levels, leverage (the debt-to-assets ratio) was near 60% regardless of foreign ownership or being an exporter. Among those reporting any debt, half of foreign-owned plants but only 10% of domestic plants reported having any foreign-currency-denominated debt in 1990-1996.

5.2. Regression Results

Table 3 presents the core results of the paper—estimates of Equations 1 and 2 (without yet introducing the leverage controls). The odd columns (1), (3), and (5) show the effect of exporting on value added, labor, and capital among the population of

all domestic plants. The even columns (2), (4), and (6) show the effect of foreign ownership on value added, labor, and capital for the population of all exporting plants, domestic and foreign.

Consider first the effect of exporting on post-crisis outcomes. Among domestic plants, those that were exporters prior to the crisis saw their value added grow by 12% relative to those that did not export.[4] Further, the same exporting plants saw their employment grow by about 8% more than that of non-exporting plants. However, the pattern does not show up for capital stock: there is no significant difference in capital post-crisis between domestic exporters and domestic non-exporters.

Thus capital-to-output and capital-to-labor ratios were declining for exporters (relative to non-exporters), consistent with the hypothesis of liquidity constraints that reduced real investment.

Among all plants that exported prior to the crisis, in contrast, the crisis was followed by higher values of all three outcomes (even rows). Exporters with some foreign ownership ("foreign exporters") grew value added by 46% relative to domestic exporters, employment by 22%, and capital by 19%. The key observation here is that all exporters increased their value added and employment after the crisis, but only exporters with foreign ownership increased investment. These results are consistent with liquidity constraints weighing more heavily for domestically owned plants.

An increase in value added can be attributed to both rising unit sales and rising prices (relative to our deflator, the wholesale price index). Thus the value-added numbers of foreign-owned plants may have increased faster than unit sales to the extent that foreign-owned exporters produce more goods priced in dollars or sell less to other nations affected by the crisis than domestically owned exporters. However,

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[4] All coefficients are statistically significant at the 5% level or better, unless indicated. We use the language of percentage changes, although technically these coefficient estimates are 100 times the change in logs.

that factor does not explain why employment grew so much faster at foreign-owned plants than at domestically owned exporters.

5.3. Robustness Checks

The results above assume similar pre-crisis trends for our different groups of factories, and ignore a number of potentially important determinants, such as differences in leverage, differences in pre-crisis size, and differences in survival rates. In this section we show that adjusting for such factors leaves our basic results unchanged.

5.3.1. Different behavior prior to the crisis

A concern in our analysis is that differing investment patterns between foreign and domestic exporters before and after the crisis simply reflect a long-term trend. To test for this possibility, we divided our pre-crisis sample into two time periods and repeated the analysis with 1993-1995 substituting for the actual post-crisis years. That is, we took 1990-1992 to be the pre-crisis years and assumed the crisis to have occurred between that period and 1993-1995. Table 4 shows the results of this "falsification exercise." Among plants with some foreign ownership, value added, employment, and capital were all higher after the placebo crisis in 1993 than before the crisis. The magnitudes were less than those estimated after the actual crisis. These results imply that a significant share of our apparent post-crisis changes may be attributable to pre- crisis trends.

Table 5 further explores the possibility that foreign and domestic exporters were following separate time trends. Here, we keep the actual post-crisis period of 1999-2000, but allow separate trends for exporters and foreign exporters to begin following the placebo crisis. That is, we ask how trends that started in 1992-1995 changed after the real crisis. The general pattern of results reported above remains unchanged. In

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fact, capital accumulation for domestic exporters is slightly negative, reversing some of the gains that began in 1992.

5.3.2. The role of leverage

We next turn to the leverage measures. If we had clean measures of leverage we would expect foreign-currency-denominated debt to predict a decline in investment as the rupiah value of the debt rose. We would further expect this factor to be lessened to the extent that revenue was also in hard currency— that is, among exporters and especially among foreign-owned exporters. Given our noisy measures (with "zero" representing both zero debt and a missing value for debt, and with only an indicator for any foreign debt, but not its amount), these analyses are largely robustness checks.

In Table 6 we condition on the interaction of post-crisis with pre-crisis leverage among plants with no foreign debt and among plants with positive foreign debt.

Pre-crisis leverage for plants with no foreign loans had a small effect in increasing employment and value added. There was a slight reduction in capital, meaning that leveraged plants had a small decline in their capital:output and capital:labor ratios— consistent with mild liquidity constraints.

Plants with some foreign-currency-denominated debt had almost identical results as plants with similar levels of overall debt but no foreign debt. The non-results on foreign-currency-denominated debt are initially surprising, because the value of the rupiah fell so far so fast that debt denominated in dollars or yen became very difficult to repay if sales were in rupiah. At the same time, if sales were largely in dollars or yen, the plant was hedged and dollar-denominated debts may merely signal a high export share and/or close relations with foreign lenders.

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5.3.3. Government ownership

Some of the estimated effects of domestic ownership may not have been due to domestic ownership per se, but to government ownership coupled with a severe budget crunch. Prior to the crisis, one in eight Indonesian factories had some government ownership, and these factories accounted for 14% of total manufacturing employment.

Many government-run plants in Indonesia were notoriously inefficient and operated under soft budget constraints afforded by public subsidy. For example, prior to the crisis favored plants routinely received loans at reduced interest rates and were not always required to repay all debt. Many of these plants also had political connections with the ruling Suharto family; prior to the crisis, these connections often permitted inefficient plants to flourish.

Following the decline of public subsidies and the downfall of the Suharto ruling family, we would expect these plants to contract. The crisis brought about a severe tightening of the budget constraint for plants with government ownership. First, government tax revenue plummeted, and the IMF required a reduction of the government deficit. Second, lenders were less willing to provide financing to the Suharto regime, and many of the banks linked to plants with government ownership were either out of business or rapidly retrenching. The result of all of these factors was a sharp decline in the availability of credit to plants with government ownership.

Table 7 adds the interaction of government ownership and the post-crisis years to our base estimation. As expected, government-owned plants experienced large declines in value added and employment relative to private plants. Capital also declined relative to private plants, but surprisingly, this decline is not statistically significant. The most salient observation for our study is that conditioning on government ownership is not an alternative explanation to our core finding that foreign exporters

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increased investment relative to domestic exporters.

5.3.4. The effect of pre-crisis size and exports

Exporters and foreign plants have more employment, capital, and sales than non-exporters and domestically owned plants. In Table 8 we condition on pre-crisis employment. Results are very similar with this added control.

We have been measuring exports with a binary dummy indicating any pre-crisis exports. It is possible that a continuous measure would be more useful, with higher net export shares reducing the ill effects of the crisis. Table 9 introduces a control for net exports (exports minus imports) normalized by the total value of output. Our core results remain unchanged. If plants cannot easily adjust their import or export shares, economic theory makes a stronger prediction: exports minus imports is what matters for post-crisis profitability and cash flow.

In fact, net export share before the crisis predicts lower value added and capital after the crisis among domestic firms. Thus, surprisingly, we find no evidence that high pre-crisis imports harmed plants after the crisis. For foreign-owned plants, higher net exports predicted higher value added.

5.3.5. Regional effects and other unobserved heterogeneity

An identifying assumption in our estimations is that the inclusion of plant fixed effects and various controls, as well as the selection of only large plants in sectors and regions with both exporting activity and FDI, results in a comparison of otherwise similar domestic and foreign-owned plants. We recognize, however, that a number of unobserved differences between foreign and domestic plants could explain differing responses to the crisis.

A particular concern is regional effects: the destination of exports and the loca-

tion of competition. Export demand may not have increased after the devaluation for plants exporting to neighboring crisis-afflicted countries. Thus one possible explanation for some of the above results could be that domestically owned plants export more to these neighbors than do foreign-owned exporters. Alternatively, domestic exporters may compete more with neighboring-country firms, who themselves benefited from a devaluation, whereas foreign exporters compete mainly with non-crisis-country rivals. Thus the devaluation may have provided fewer investment incentives to domestic exporters. Unfortunately, we do not know the country destination of exports or the location of exporters' competitors. However, two findings suggest that neither of these regional effects explains our results.

First, we investigated whether exporters with foreign ownership based in other crisis-stricken countries invested differently than other foreign exporters. Specifically, we created an indicator variable for crisis-country ownership and interacted this variable with $(Foreign * Post)_{it}$ in our estimations. The interaction coefficient was near zero and not significant. One might reasonably expect foreign-owned factories to export some of their output to the parent company's country. To the extent that this occurs, destination country does not appear to matter, perhaps because the rupiah depreciated even with respect to neighboring currencies.

Second, BPS conducted a post-crisis follow-up survey of 900 surviving manufacturing firms. The survey asked establishments to list the country of their major competitor. Among the several hundred exporters in the sample, no significant differences were apparent in the geographical distribution of competitors.

Another approach to controlling for some of the unobserved regional effects and other heterogeneity is to estimate by industry. To the extent that factories producing similar products will have similar export destinations, competitors, and other attributes, by-industry estimation reduces unobserved heterogeneity at the cost of

smaller sample sizes. We repeated our estimations for the five 2-digit ISIC industries for which we have more than 500 establishments in our sample.[5] Although not always statistically significant, we obtained similar results for four industries: manufactured food (ISIC 31), textiles (ISIC 32), wood and paper (ISIC 33), and chemicals (ISIC 35). Only in metal products (ISIC 38) did we find different results—domestic exporters increased investment; foreign exporters did not.

5.3.6. Are pre-crisis exporters also the post-crisis exporters?

An additional identifying assumption in these estimations is that exporting activity pre-crisis is a predictor of exporting activity post-crisis. The data in Table 2 (bottom row) support this assumption, although there is more churning than we had expected. Given the expense and time of establishing overseas marketing channels, our priors are that few plants that did not export before the crisis would be able to start exporting afterward. Indeed, only 13% of non-exporters in the pre-crisis period started exporting later. The ability of these plants to switch to exporter status biases the coefficients in the odd columns down by a trivial amount in comparison with the true effect of being a potential exporter.

Further, it is also important to note that, as shown in Table 2, the share of output exported is roughly equal across all exporting plants, regardless of ownership. We thus expect the currency devaluation to affect all exporting plants' investment prospects about equally. Overall, we were surprised by the large percentage of plants that exported in 1993-1995 but did not export after the crisis, as shown in Table 2.Only about 60% of domestic exporters continued to export post-crisis. This may not be surprising if the plants lacked access to working capital needed to continue export operations. We are more surprised that a similar share, only 59%, of foreign

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[5]These estimation results are not reported here, but are available from the authors.

exporters continued to export after the crisis. The continued shift of multinational production to China is one possible explanation, as is the unwillingness of some foreign customers to continue relying on suppliers in a nation that they perceive as increasingly unstable. The table includes only plants that survived the crisis, so exits do not explain the low rates of export continuation.

5.3.7. Differential plant survival

Last, Table 10 shows the effect of pre-crisis exporting and foreign ownership on plant survival. The dependent variable is survival until the year 2000, which we estimate using a probit model with the coefficients expressed as probabilities. As expected, the more capital-intensive plants before the crisis had higher survival rates after the crisis. Conditioning on those variables and 5-digit industry, exporting (among domestically owned plants), and foreign ownership (among exporters) had no large or statistically significant effect on survival.

The zero effect of exporting on survival is unexpected for domestic exporters. For foreign plants, the finding is less surprising because our data do not distinguish between plants closed by bankruptcy and plants that relocated. As noted above, Bernard and Sjoholm (2003) found that before the crisis foreign plants had a roughly 30% higher exit rate in Indonesia than otherwise similar domestically owned plants. Our results are not statistically significant, and we cannot reject somewhat higher excess mortality rates among foreign-owned plants. However, it seems likely that the post-crisis excess mortality of foreign firms is lower the than the pre-crisis level Bernard and Sjoholm reported.

Columns (2) and (4) of Table 10 consider the effect of a plant's pre-crisis productivity on survival. Productivity is the difference between a plant's fixed effect in a translog production function estimation minus the mean fixed effect of other plants

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in the same 4-digit ISIC industry. That is, positive values indicate high productivity, and negative values indicate low productivity. Reassuringly, strong performers pre-crisis are more likely to survive post-crisis. Other results were not affected by the additional control.

6. What Have We Learned?

Our findings provide evidence that capital market imperfections may reduce exporters' investment and thus amplify emerging market crises. Trade theory suggests that exporting firms should increase profits, expand employment, and invest in new capital following a real devaluation. For domestic Indonesian exporters, however, we observe only the first two effects, but do not see increased investment. Liquidity constraints are a likely explanation. Whereas increases in employment could be financed through cash flow, capital investment required obtaining credit from a struggling financial sector. In contrast, Indonesian exporters with foreign ownership did expand investment. A priori, we see no reason other than financing availability why investment would depend on ownership. While domestic exporters may have faced a credit crunch, exporters with foreign ownership could access credit through their parent company and thus insure themselves against liquidity constraints. Finally, we note that a surprisingly large share, 40%, of pre-crisis domestic exporters did not continue exporting following the crisis. Although this phenomenon requires further investigation, liquidity constraints, an overall decline in the regional economy, or competition from Chinese and other East Asian exporters may explain it.

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A. Tables

1997	
July 2	Thai baht is floated and depreciates by 15-20 percent.
July 11	Widening of rupiah band.
July 24	Currency meltdown with severe pressure on baht, ringgit, peso and rupiah.
August 14	Ending of rupiah band and immediate plunge.
November 1	16 banks closed, with promise of more to follow. Deposits were not guaranteed.
November 5	Three-year standby agreement with IMF approved.
Mid-December	Almost half of Indonesian bank deposits exit the system.
1998	
Mid-January	Further downward pressure on the rupiah.
January 27	Bank deposits formally guaranteed by the new super-agency: Indonesia Bank Reconstruction Agency.
March 11	President Suharto re-elected.
Mid-May	Widespread rioting.
May 21	Vice President Habibe succeeds Suharto as president.

Table 1: Timeline of financial crisis. Adopted from Enoch, Baldwin, Frecaut, and Kovanen 2001.

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exported  |  foreign ownership 1993-95
1993-95   |     No     Yes    Total
----------+----------------------
     No |  3,221     261   3,482      No. factories
        | 334.22  453.16  343.13      No. employees
        |  13.17   15.20   13.32      Log (capital)
        |   0.80    0.84    0.80      Prob. survived until 2000
        |   0.00    0.00    0.00      Share output exported pre-crisis
        |   0.13    0.21    0.14      Prob. exported post-crisis (for survivors)
        |
    Yes |  2,435     690   3,125
        | 667.57  656.22  665.06
        |  13.96   14.67   14.12
        |   0.83    0.87    0.84
        |   0.53    0.57    0.54
        |   0.60    0.59    0.60
        |
  Total |  5,656     951   6,607
        | 477.73  600.49  495.40
        |  13.52   14.81   13.71
        |   0.81    0.86    0.82
        |   0.23    0.42    0.25
        |   0.34    0.49    0.36
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Table 2: Descriptive statistics by establishment type in 1995. Foreign factories are those that had foreign equity anytime from 1993 to 1995. Exporters are those that exported anytime from 1993 to 1995.

	value added domestic est. (1)	value added exporting est. (2)	labor domestic est. (3)	labor exporting est. (4)	capital domestic est. (5)	capital exporting est. (6)
Exported 1993-1995 * post-crisis	.124 (.033)***		.078 (.014)***		-.036 (.032)	
Foreign 1993-1995 * post-crisis		.46 (.044)***		.222 (.02)***		.187 (.046)***
1991	.089 (.033)**	.005 (.043)	.075 (.014)***	.037 (.02)	.055 (.028)*	.044 (.04)
1992	.261 (.032)***	.171 (.042)***	.15 (.014)***	.135 (.019)***	.178 (.027)***	.223 (.039)***
1993	.345 (.032)***	.347 (.041)***	.253 (.014)***	.256 (.019)***	.269 (.027)***	.354 (.038)***
1994	.469 (.032)***	.463 (.041)***	.318 (.014)***	.35 (.019)***	.368 (.027)***	.466 (.038)***
1995	.472 (.031)***	.487 (.04)***	.35 (.013)***	.399 (.019)***	.404 (.026)***	.534 (.038)***
1999	.295 (.034)***	.458 (.042)***	.186 (.014)***	.286 (.02)***	.089 (.031)**	.106 (.042)*
2000	.279 (.034)***	.317 (.042)***	.205 (.014)***	.283 (.02)***	.044 (.032)	.104 (.044)*
Obs.	25955	13017	26749	13334	17005	8668
R^2	.02	.048	.053	.087	.044	.057
No. establishments	6589	1936	6649	1936	4862	1446
F statistic	50.348	69.724	139.823	135.352	69.405	54.168

Table 3: Sample of domestic establishments (columns 1, 3, 5) and exporting establishments (columns 2, 4, 6). Estimations include factory fixed effects. 1990 is the omitted year.

	value added	value added	labor	labor	capital	capital
	domestic est.	exporting est.	domestic est.	exporting est.	domestic est.	exporting est.
	(1)	(2)	(3)	(4)	(5)	(6)
Exported 1993-1995 * post-placebocrisis	-.005 (.032)		.05 (.014)***		.123 (.027)***	
Foreign 1993-1995 * post-placebocrisis		.299 (.045)***		.099 (.02)***		.11 (.04)**
1991	.1 (.029)***	.033 (.038)	.084 (.013)***	.054 (.017)**	.053 (.025)*	.047 (.034)
1992	.278 (.029)***	.219 (.037)***	.168 (.013)***	.168 (.017)***	.176 (.025)***	.226 (.033)***
1993	.388 (.032)***	.33 (.038)***	.255 (.014)***	.269 (.018)***	.208 (.027)***	.326 (.035)***
1994	.517 (.032)***	.462 (.038)***	.327 (.014)***	.372 (.017)***	.31 (.027)***	.446 (.034)***
1995	.542 (.032)***	.5 (.038)***	.368 (.014)***	.427 (.017)***	.358 (.027)***	.529 (.035)***
Obs.	13712	9240	14035	9462	9644	6680
R^2	.052	.069	.123	.149	.062	.088
F statistic	100.652	90.557	262.558	218.869	83.759	84.682
No. establishments	2794	1932	2798	1936	2020	1428

Table 4: A falsification exercise with "placebo crisis" between 1992 and 1993. Sample of domestic establishments (columns 1, 3, 5) and exporting establishments (columns 2, 4, 6). Estimations include factory fixed effects. 1990 is the omitted year.

	value added domestic est. (1)	value added exporting est. (2)	labor domestic est. (3)	labor exporting est. (4)	capital domestic est. (5)	capital exporting est. (6)
Exported 1993-1995 * post-crisis	.131 (.036)***		.06 (.015)***		-.079 (.034)*	
Exported 1993-1995 * post-placebocrisis	-.019 (.035)		.046 (.015)**		.112 (.03)***	
Foreign 1993-1995 * post-crisis		.359 (.047)***		.191 (.022)***		.148 (.049)**
Foreign 1993-1995 * post-placebocrisis		.277 (.049)***		.085 (.023)***		.113 (.045)*
1991	.089 (.033)*	.008 (.043)	.075 (.014)***	.038 (.02)	.057 (.028)*	.046 (.04)
1992	.26 (.032)***	.178 (.042)***	.151 (.014)***	.138 (.019)***	.181 (.027)***	.226 (.039)***
1993	.354 (.036)***	.274 (.043)***	.231 (.015)***	.234 (.02)***	.216 (.03)***	.323 (.04)***
1994	.478 (.036)***	.389 (.043)***	.297 (.015)***	.328 (.02)***	.314 (.03)***	.436 (.04)***
1995	.481 (.035)***	.413 (.043)***	.329 (.015)***	.377 (.02)***	.351 (.03)***	.503 (.04)***
1999	.301 (.035)***	.415 (.043)***	.173 (.015)***	.273 (.02)***	.057 (.032)	.088 (.042)*
2000	.284 (.035)***	.274 (.043)***	.193 (.015)***	.27 (.02)***	.012 (.033)	.086 (.045)
Obs.	25955	13017	26749	13334	17005	8668
R^2	.02	.051	.053	.088	.045	.057
F statistic	44.787	65.634	125.349	121.958	63.36	48.878
No. establishments	6589	1936	6649	1936	4862	1446

Table 5: Estimation allowing for differing pre-crisis time trends between exporters and non-exporters, and between foreign and domestic exporters. Sample of domestic establishments (columns 1, 3, 5) and exporting establishments (columns 2, 4, 6). Estimations include factory fixed effects. 1990 is the omitted year.

	value added domestic est. (1)	value added exporting est. (2)	labor domestic est. (3)	labor exporting est. (4)	capital domestic est. (5)	capital exporting est. (6)
Exported 1993-1995 * post-crisis	.215 (.042)***		.11 (.018)***		.072 (.04)	
Foreign 1993-1995 * post-crisis		.421 (.059)***		.176 (.026)***		.147 (.058)*
Leverage and foreign bank loans * post-crisis	.0006 (.001)	.003 (.001)**	.002 (.0004)***	.001 (.0005)**	-.001 (.001)*	0 (.001)
Leverage and no foreign bank loans * post-crisis	.001 (.0006)	.002 (.0008)*	.001 (.0003)***	.001 (.0004)***	-.002 (.0006)***	-.001 (.0008)*
1991	.121 (.042)**	.013 (.052)	.084 (.018)***	.04 (.024)	.081 (.035)*	.075 (.048)
1992	.269 (.041)***	.167 (.051)**	.166 (.018)***	.136 (.023)***	.22 (.035)***	.256 (.046)***
1993	.389 (.04)***	.379 (.05)***	.265 (.018)***	.269 (.023)***	.295 (.034)***	.37 (.046)***
1994	.534 (.04)***	.518 (.05)***	.338 (.018)***	.367 (.022)***	.408 (.034)***	.53 (.045)***
1995	.564 (.04)***	.556 (.05)***	.375 (.018)***	.424 (.022)***	.451 (.034)***	.613 (.045)***
1999	.234 (.056)***	.375 (.07)***	.143 (.025)***	.261 (.031)***	.222 (.051)***	.297 (.068)***
2000	.148 (.056)**	.25 (.07)**	.15 (.025)***	.257 (.031)***	.195 (.052)***	.279 (.069)***
Obs.	12067	8069	12305	8218	8253	5722
R^2	.034	.061	.07	.112	.057	.067
No. establishments	2069	1182	2074	1182	1544	912
F statistic	35.218	44.348	77.315	88.381	40.47	34.519

Table 6: With leverage control. Sample of domestic establishments (columns 1, 3, 5) and exporting establishments (columns 2, 4, 6). Estimations include factory fixed effects. 1990 is the omitted year.

	value added domestic est. (1)	value added exporting est. (2)	labor domestic est. (3)	labor exporting est. (4)	capital domestic est. (5)	capital exporting est. (6)
Exported 1993-1995 * post-crisis	.136 (.033)***		.085 (.014)***		-.03 (.032)	
Foreign 1993-1995 * post-crisis		.443 (.044)***		.212 (.02)***		.184 (.046)***
Government-owned 1993-1995 * post-crisis	-.325 (.068)***	-.423 (.079)***	-.17 (.029)***	-.237 (.036)***	-.134 (.07)	-.073 (.088)
1991	.089 (.033)**	.006 (.043)	.075 (.014)***	.037 (.02)	.055 (.028)*	.044 (.04)
1992	.261 (.032)***	.172 (.042)***	.151 (.014)***	.136 (.019)***	.178 (.027)***	.223 (.039)***
1993	.345 (.032)***	.348 (.041)***	.253 (.014)***	.257 (.019)***	.269 (.027)***	.354 (.038)***
1994	.47 (.032)***	.466 (.041)***	.319 (.013)***	.352 (.019)***	.368 (.027)***	.467 (.038)***
1995	.473 (.031)***	.49 (.04)***	.351 (.013)***	.401 (.019)***	.404 (.026)***	.534 (.038)***
1999	.31 (.034)***	.495 (.043)***	.194 (.014)***	.307 (.02)***	.094 (.031)**	.112 (.042)**
2000	.294 (.034)***	.353 (.043)***	.213 (.014)***	.304 (.02)***	.049 (.032)	.11 (.045)*
Obs.	25955	13017	26749	13334	17005	8668
R^2	.022	.05	.054	.09	.044	.057
F statistic	47.353	65.328	128.493	125.571	62.124	48.228
No. establishments	6589	1936	6649	1936	4862	1446

Table 7: With government-ownership control. Sample of domestic establishments (columns 1, 3, 5) and exporting establishments (columns 2, 4, 6). Estimations include factory fixed effects. 1990 is the omitted year.

	value added domestic est. (1)	value added exporting est. (2)	labor domestic est. (3)	labor exporting est. (4)	capital domestic est. (5)	capital exporting est. (6)
Exported 1993-1995 * post-crisis	.183 (.038)***		.064 (.017)***		.009 (.037)	
Foreign 1993-1995 * post-crisis		.408 (.056)***		.199 (.026)***		.171 (.056)**
1995 employee count * post-crisis	.00003 (.00002)	.00003 (.00002)	.00004 (1.00e-05)***	.00003 (1.00e-05)*	.00004 (.00002)*	.00004 (.00002)
1991	.118 (.037)**	.017 (.048)	.077 (.017)***	.042 (.022)	.081 (.033)*	.061 (.045)
1992	.272 (.037)***	.176 (.047)***	.154 (.017)***	.137 (.022)***	.193 (.032)***	.223 (.044)***
1993	.374 (.036)***	.353 (.046)***	.25 (.017)***	.259 (.022)***	.27 (.032)***	.329 (.043)***
1994	.489 (.036)***	.458 (.046)***	.318 (.016)***	.351 (.021)***	.368 (.031)***	.465 (.043)***
1995	.492 (.036)***	.475 (.046)***	.345 (.016)***	.395 (.021)***	.413 (.031)***	.551 (.043)***
1999	.257 (.041)***	.404 (.05)***	.19 (.019)***	.277 (.023)***	.039 (.038)	.121 (.049)*
2000	.164 (.041)***	.254 (.05)***	.185 (.019)***	.267 (.023)***	.034 (.039)	.102 (.051)*
Obs.	14036	9521	14333	9720	9434	6575
R^2	.028	.047	.059	.091	.047	.057
No. establishments	2021	1400	2021	1400	1497	1057
F statistic	34.527	40.189	76.476	83.184	39.372	33.365

Table 8: With labor size control. Sample of domestic establishments (columns 1, 3, 5) and exporting establishments (columns 2, 4, 6). Estimations include factory fixed effects. 1990 is the omitted year.

	value added domestic est. (1)	value added exporting est. (2)	labor domestic est. (3)	labor exporting est. (4)	capital domestic est. (5)	capital exporting est. (6)
Exported 1993-1995 * post-crisis	.216 (.042)***		.068 (.018)***		.039 (.04)	
Foreign 1993-1995 * post-crisis		.459 (.044)***		.222 (.02)***		.187 (.046)***
Pre-crisis net export share * post-crisis	-.18 (.052)***	.078 (.027)**	.021 (.021)	.021 (.011)	-.145 (.049)**	.003 (.019)
1991	.089 (.033)**	.006 (.043)	.075 (.014)***	.037 (.02)	.055 (.028)*	.044 (.04)
1992	.26 (.032)***	.172 (.042)***	.15 (.014)***	.135 (.019)***	.178 (.027)***	.223 (.039)***
1993	.344 (.032)***	.348 (.041)***	.253 (.014)***	.257 (.019)***	.269 (.027)***	.354 (.038)***
1994	.467 (.032)***	.464 (.041)***	.318 (.014)***	.35 (.019)***	.367 (.027)***	.466 (.038)***
1995	.47 (.031)***	.489 (.04)***	.35 (.013)***	.4 (.019)***	.403 (.026)***	.534 (.038)***
1999	.225 (.039)***	.449 (.042)***	.194 (.016)***	.284 (.02)***	.032 (.036)	.106 (.042)*
2000	.209 (.039)***	.308 (.043)***	.213 (.016)***	.28 (.02)***	-.011 (.037)	.103 (.044)*
Obs.	25955	13017	26749	13334	17005	8668
R^2	.021	.049	.053	.087	.044	.057
F statistic	46.109	62.941	124.397	120.756	62.739	48.146
No. establishments	6589	1936	6649	1936	4862	1446

Table 9: With net exports control. Sample of domestic establishments (columns 1, 3, 5) and exporting establishments (columns 2, 4, 6). Estimations include factory fixed effects. 1990 is the omitted year.

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| | Survival until 2000 | | | |
	(1)	(2)	(3)	(4)
Exported 1993-1995	.008 (.047)	.006 (.047)		
Foreign equity 1993-1995			.008 (.077)	.009 (.078)
Productivity		.032 (.061)		.082 (.082)
log(capital)	.131 (.013)***	.129 (.013)***	.168 (.018)***	.165 (.019)***
Obs.	4020	3955	2321	2302
Pseudo R^2	.028	.028	.042	.044

Table 10: Probit estimation of probability of survival until 2000 for establishments existing in 1995. Domestic establishments (1-2) and exporting establishments (3-4). 5-digit ISIC industry indicators and province indicators are included but not reported.