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Financial Reforms and International Trade

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ABSTRACT

This research has been undertaken to estimate the effects of one of the major impediments to trade particularly of developing and less developed countries meaning credit constraints. In this paper we address the issue of easing of financial constraints on trade flows. Financial repression is generally a common characteristic across many developing countries. We provide evidence that financial reforms (over the period 1976–2005) significantly affected exports, in particular of industries with high external capital dependence and low asset tangibility. The coverage of reforms is comprehensive, encompassing the banking sector, interest rates, and equity and international capital markets. Our methodology improves upon existing studies by controlling for time-varying unobserved exporter characteristics. We find significant effects of various reforms with diverse impacts by intensity. China emerges as a consistent outlier, but the results are robust to its inclusion or exclusion. Further, event studies that incorporate possible anticipated and lagged effects of commencement of reform policies confirm the findings.

Keywords: financial reforms, external capital dependence, asset tangibility, time-varying unobserved heterogeneity, event study

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1. INTRODUCTION

Countries with a well-developed financial sector have a comparative advantage in industries and sectors that rely on external finance (Kletzer and Bardhan 1987). Beck (2003) and Svaleryd and Vlachos (2005) have presented empirical evidence supporting this hypothesis. Chang, Hung, and Lu (2005) showed that the share of exports in gross domestic product (GDP) is higher in countries with advanced financial systems than in those without such systems.

How international trade flows are affected by financial development—assessed by commonly used measures such as credit issued by commercial banks—has been studied by several authors (see Manova 2008b; Berthou 2007; Chang, Hung, and Lu 2005; Hur, Raj, and Riyanto 2006; and Beck 2002). Financial development, or the state of the financial sector in a country, however, is itself in large part an outcome of policies of financial reform. In this paper, we focus on financial reforms—that is, the actual policies—and estimate their effects on international trade flows.[1]

Financial reforms can render specific benefits to firms. Jayaratne and Strahan (1996) showed that the relaxation of interstate banking and branching restrictions in the United States caused faster economic growth, sensitized bank lending decisions to firm performance, reduced entry barriers, and improved access to finance for small firms (see also Cetorelli and Strahan 2006; Stiroh and Strahan 2003).

Exporting firms are assumed to be relatively more restricted by initial entry costs (and fixed costs of exporting) vis-à-vis firms that cater exclusively to the domestic markets. Trade economists increasingly recognize the role of firm heterogeneity and fixed costs in exporting (Melitz 2003; Helpman, Melitz, and Rubinstein 2008). Ahn, Amiti and Weinstein (2011) demonstrated that domestic sales are not affected by the banks' providing trade finance, and in the recent financial crisis, trade finance contractions alone could explain about one-third of the drop in exports, or as much as fundamentals.[2]

While an extensive literature documents the effects of financial liberalization on economic growth (Bekaert, Harvey, and Lundblad 2005; Girma et al. 2009; Klein and Olivei 2008; Ranciere, Tornell, and Westermann 2006), when it comes to international trade it is only equity market liberalization that has been studied. Manova (2008a), drawing on measures from Bekaert, Harvey, and Lundblad (2005), assessed the effect of equity market liberalization on exports.

A vast literature exists on the portfolio choice of firms between debt and equity. In a pioneering work, Modigliani and Miller (1958) showed that, in an Arrow-Debreu environment (complete markets, no transaction costs, no taxes, no bankruptcy costs), firms could be indifferent between debt and equity financing. Since these conditions are generally not met in reality—capital markets are never perfect or complete, and there are taxes and agency problems—the allocation by firms between debt and equity (both domestic and foreign) becomes a substantive issue (Tirole 2006).

The importance of equity markets in relation to debt markets has been shown to be higher in developed than in lesser-developed economies (see Boyd and Smith 1998). Thus, with countries at different levels of economic development, focusing on equity markets per se could be limiting. There are other reforms, for example those related to banking supervision that could have significant effects on the supply of capital. Even within banking sector reforms there is significant variation over time and across countries.[3]

This paper uses a comprehensive account of financial reforms from Abiad, Detragiache, and Tressel (2010) that documents countries' financial reforms across seven dimensions. It covers not just the equity market—which is one of the seven dimensions—but also the banking sector, the market structure

[1] In our analysis we use measures of reforms (such as those related to banking supervision) that go beyond measures of liberalization. The dataset that we employ uses the terms *liberalization* and *reforms* interchangeably.

[2] Exporters tend to be bigger users of trade financing than domestic firms because international transactions take much longer to execute than domestic transactions and international transactions are perceived to be of higher risk.

[3] State ownership of banks has been, and still is, more widespread in developing countries than in others, but across all countries it has been declining over time beginning in the late 1980s. Megginson (2003) showed that state ownership is higher in countries with a socialist legal tradition. Also countries with commercial codes based on French civil law have generally higher state ownership.

in the financial industry, and international capital flows, as well as money supply and transmission mechanisms. Using a robust empirical methodology that controls for industry- and time-varying exporter characteristics, we provide evidence that financial reforms have had positive and significant effects on industry-level exports.

We are also able to include differences in the intensity of reforms and find that reforms with higher intensity are more influential, which reinforces the overall impact of reforms. While there are some exceptions, in general, relative to a situation of full repression, as reforms progress toward less repression to partial liberalization to full liberalization, the effects become incrementally larger. Estimates of any financial reform assessed singularly or without variation in intensity could thus be inadequate.

Apart from a comprehensive view of reforms, we feel that a proper empirical framework would need to account for time-varying changes in the countries' policies and environment to obtain effects that could be treated as causal. Our rich empirical specification controls for unobserved time-varying characteristics (such as institutional quality) of the exporting country by incorporating fixed effects for each exporter at each time period, as well as unobserved industry-specific attributes by including industry fixed effects.

The importance of exporter–time fixed effects (a fixed effect for each exporter at each time period) cannot be underestimated. Countries around the world have been joining multilateral, bilateral, and regional trade agreements as well as customs or currency unions. Various country-specific events have occurred at different points in time with clear effects on exports: Mexico, for instance, faced a financial crisis in 1994/95 that coincided with the initiation of the North American Free Trade Agreement (NAFTA); many (but not all) countries in the developed world faced a crisis in 2008; China joined the World Trade Organization (WTO) in 2001, thus emerging as a more potent competitor for Mexico in the US markets; the European Union brought in many eastern European countries after 2000 (but at different points in time). Such exporter-time-specific events need to be accounted for in any meaningful analysis of trade flows.

Many of these events are observed and in theory can be controlled for in a regression. However, it is not realistic to expect that a researcher can account for each and every country-specific event occurring at a different point in time that in some way or another affects trade. Besides, even for observed events, the exact span of their effects may be largely unobserved. Mexican exports to the United States, for example, jumped by an average of 28.3 percent per year from 1991 to 1993 in anticipation of NAFTA (Salvatore 2007). Hence, anticipation of accession of China into the WTO before 2001, country-specific adjustments to the impending dissolution of the Multifiber Arrangement in 2005, and expansion of exports in anticipation of NAFTA are all unobserved factors that only an exporter–time fixed effect can adequately control for in explaining trade flows.

Accounting for exporter–time unobserved factors, however, implies that the stand-alone effect of a reform, which is exporter-time-specific, cannot be identified. Our identification strategy therefore involves utilizing the variation in external financial dependence and asset tangibility across industries to capture the effects of different financial reform measures on industry-level exports (Hur, Raj, and Riyanto 2006 and Manova 2008a followed a similar strategy). The tangibility of assets of a particular industry is related to the ability of these assets to act as collateral while the external finance dependence captures the ability of a particular industry to generate internal cash flow to finance investment (Hur, Raj, and Riyanto 2006). An added advantage of using the industry-level exports variable is that it mitigates concerns of reverse causality. Reforms that take place at the national level are not likely to be affected by export flows in one of the 28 industries in any significant way.

Firm characteristics and level of financial development have been shown to account for accessibility and quantity of external capital (see Levine 2004). Hur, Raj, and Riyanto (2006), using industry-level data on firms' external finance dependence and asset tangibility, found that economies with higher levels of financial development have greater export shares and trade balance in industries with more intangible assets. Bradley, Jarrell, and Kim (1984) empirically showed that a larger amount of intangible assets reduces the borrowing capacity of a firm. We find that, within the same country, most financial reforms (though not all) lead to significant increases in exports in industries that have higher

external capital dependence and greater share of intangible assets. Moreover, we find that the impact of financial reforms differs according to whether the cross-industry variation is along external capital dependence or asset tangibility.

With different reforms, this distinction is quite revealing. In our results, for industries with fewer tangible assets, equity market reforms and those related to international capital result in stronger effects compared with those in the banking sector. Further, effects of reform have much greater variation across industries differing in external capital dependence, compared with those across industries differing in asset intangibility. The measure external capital dependence is indiscriminate across sources of funds (debt or equity, for example). Hence, all measures of reforms (securities, banking, international capital, and so on) tend to have greater effects for industries with greater external financial dependence vis-à-vis industries with low shares of tangible assets, which could likely be most effective in borrowing from banks.

At a broader level, Henry and Lorentzen (2003) made a distinction between debt and equity liberalization and argued that much of the negativity regarding capital account liberalization (following several crises) stems from clubbing them together. They argued that after equity market liberalization, capital becomes cheaper, investment booms, and economic growth increases. In contrast, debt market liberalization has often led to an increase in the vulnerability of banks, companies, and governments to changes in financial markets' perceptions of their ability to pay back loans. The evidence in this paper shows that in terms of the effects on exports, both reforms tend to have positive and significant effects. With cross-country, -industry, and -time variation, results reveal that each reform is important in its own right, including debt, equity, and international capital.

Tressel and Detragiache (2008), drawing from McKinnon (1973) and Shaw (1973), showed that widespread state interference in financial markets results in low financial savings, high lending rates, monopoly power by banks, low financial intermediation, and concentration of credit in favored sectors and firms, especially in developing countries. Our findings regarding reduced government control of interest rates and banking services support the argument that with less government interference a credit crunch could be mitigated, particularly for sectors and firms that are not among the favored ones.

In the literature we find that even not-so-direct measures of liberalization, such as banking supervision, have affected loan growth (see Curry, Fissel, and Ramirez 2006). Beck et al. (2008) showed that within banking supervision some measures ease firms' financing obstacles more than other measures.[4] A standard form of banking supervision, for example with bars on capital ratios, could affect loan disbursements as banks adjust their risk-weighted assets. Our results provide some support for such measures by presenting evidence of their positive effects on exports.

Finally, by adopting an event study approach, we find that some reforms do have lagged effects. The most prominent ones that exhibit lagged effects are banking supervision, privatization, and interest rate controls. Alongside this finding, we find that financial reforms have a strong and positive effect on the extensive margin—that is, for each industry on the number of destinations that it exports to.

Also in our analysis, we find that China stands out as a clear outlier, with the size of the average effect of reforms as well as their significance being quite different without China. We therefore check the robustness of our findings with and without China.

The paper is structured as follows: Section 2 presents the data and descriptive statistics of key variables that are later used in the regression analysis; Section 3 presents the estimation strategy; Section 4 provides the findings; the last section concludes.

[4] Prudential regulation requires an optimal level of supervision. Excessive regulation and supervision can hurt the banking sector. In the past, especially in the early 1990s, excessive regulation and supervision were often cited as the reasons banks had a lending crunch (Peek and Rosengren 1998; Berger, Kyle, and Scalise 2001).

2. DATA AND DESCRIPTIVE STATISTICS

Financial Reforms

We combine long-term multidimensional data on financial reforms, data on countries' exports at the three-digit level (International Standard Industrial Classification, or ISIC, Revision 2), and information on financial structure by industry. The trade information is obtained from UN Comtrade (deflated with the base year 2000). Data on financial structure by industry are obtained from Braun (2003) along the lines of Hur, Raj, and Riyanto (2006) and Manova (2008a).

The financial reform measures are obtained from Abiad, Detragiache, and Tressel (2010), who constructed a new database that records a country's financial liberalization across seven dimensions. It covers 91 countries for the period 1973–2005. After matching data on industries and trade, we are left with data on 84 countries for the period 1976–2005. See Appendix B for detailed descriptions of the reforms. Briefly, the reform measures in Abiad, Detragiache, and Tressel (2010) are as follows:

- *Directed credit*: Removing government policies to channel funds to certain *priority* sectors, reducing coverage of subsidized rates, lowering reserve requirements, and the like
- *Interest rate controls*: Loosening government controls over lending and deposit rates; lowering government control over interest rate through ceilings, floors, bands, and so on
- *Banking supervision*: Adoption of risk-based capital adequacy ratios based on the Basel I capital accord, ensuring independence and legal power of supervisory agencies, comprehensiveness of oversight and monitoring
- *Privatization*: Lowering of the share of banking-sector assets controlled by state-owned banks
- *Entry barriers*: Lowering entry barriers for both domestic and foreign banks
- *International capital*: Unified exchange rate system and lower restrictions on capital inflow and outflow
- *Securities market*: Policies to encourage and develop securities markets, such as establishment of debt and equity markets, tax incentives or development of depository and settlement systems, deregulation of stock exchanges, and opening up of securities markets for foreign investors

The score for each measure of reform is computed based on a survey, and the final score is assigned into one of four categories: fully repressed = 0, partially repressed = 1, partially liberalized = 2, and fully liberalized = 3. Easing of restrictions and positive policy stances—such as openness of securities markets to attract new investors, especially foreigners who can bring in external capital—qualify a country as partially or fully liberalized, depending on the extent of reforms. In state ownership of the banking sector, for example, thresholds of 50 percent, 25 percent, and 10 percent of asset ownership by the state are used to determine the grades between full repression and full liberalization. More prudential regulations and tighter supervision of the banking sector indicate a healthier financial sector. Hence, in this case greater government regulation could qualify as reform.

Overall financial reform is obtained by summing over 7 individual scores (each coded as 0, 1, 2, or 3) and dividing the sum by 21, thereby normalizing it to a [0,1] interval. We will call the normalized score the overall financial reform index (OFRI). Besides OFRI, we will also address each reform measure individually. We convert the scores into binary indicator variables—that is, for each reform category, whether a country is "fully repressed or not," "partially repressed or not," "largely liberalized or not," and "fully liberalized or not." These 28 dummy variables provide a comprehensive description of the state of financial reforms in a country. Table 2.1 presents the summary statistics on reform measures in different categories and intensities of reforms in the sample.

Table 2.1—Summary statistics

Variable		mean	sd	min	max
Trade (in US$ millions, in 2000 US GDP)		1,885.80	7,491.33	0.000001	204,000.00
GDP per capita (in 2005 US GDP)		10,785.15	12,498.09	122.45	65,324.03
Trade liberalization		0.76	0.42	0.00	1
Abiad, Detragiache, and Tressel (2010) reform index		0.58	0.29	0.00	1
Directed credit	Index	1.85	1.09	0.00	3
	Fully repressed	0.14	0.35	0.00	1
	Partially repressed	0.27	0.44	0.00	1
	Partially liberalized	0.20	0.40	0.00	1
	Fully liberalized	0.39	0.49	0.00	1
Interest rate controls	Index	2.15	1.18	0.00	3
	Fully repressed	0.17	0.38	0.00	1
	Partially repressed	0.12	0.33	0.00	1
	Partially liberalized	0.09	0.29	0.00	1
	Fully liberalized	0.62	0.49	0.00	1
Entry barriers	Index	1.98	1.11	0.00	3
	Fully repressed	0.22	0.41	0.00	1
	Partially repressed	0.22	0.41	0.00	1
	Partially liberalized	0.17	0.38	0.00	1
	Fully liberalized	0.47	0.50	0.00	1
Privatization	Index	0.99	1.01	0.00	3
	Fully repressed	0.41	0.49	0.00	1
	Partially repressed	0.28	0.45	0.00	1
	Partially liberalized	0.21	0.40	0.00	1
	Fully liberalized	0.10	0.30	0.00	1
Banking supervision	Index	1.44	1.19	0.00	3
	Fully repressed	0.31	0.46	0.00	1
	Partially repressed	0.21	0.41	0.00	1
	Partially liberalized	0.20	0.40	0.00	1
	Fully liberalized	0.28	0.45	0.00	1
International capital	Index	1.95	1.06	0.00	3
	Fully repressed	0.11	0.31	0.00	1
	Partially repressed	0.27	0.44	0.00	1
	Partially liberalized	0.19	0.39	0.00	1
	Fully liberalized	0.44	0.50	0.00	1
Securities market	Index	1.82	1.08	0.00	3
	Fully repressed	0.14	0.35	0.00	1
	Partially repressed	0.27	0.44	0.00	1
	Partially liberalized	0.23	0.42	0.00	1
	Fully liberalized	0.37	0.48	0.00	1
External financial dependence		0.24	0.32	-0.45	1.1401
Asset tangibility		0.30	0.14	0.07	0.6708

Source: Abiad, Detragiache, and Tressel (2010).
Notes: N = 47,496.

Compared with other financial reform databases, the Abiad, Detragiache, and Tressel (2010) dataset has several advantages. First, it covers a wide range of countries over several years, unlike other existing measures, such as that of Williamson and Mahar (1998), which has 34 countries and covers 1973–96, and that of Kaminsky and Schmukler (2003), which has 28 countries and covers 1973–99. The measures of reforms used by Abiad, Detragiache, and Tressel (2010) are also more comprehensive. Williamson and Mahar (1998) defined six variables that mainly analyzed capital flows. In Abiad, Detragiache, and Tressel (2010), each reform indicator has a graded score, a method better suited to measuring the intensity of reforms. In several studies, for example Laeven (2003), reforms are measured as a binary variable, which cannot capture intensity of reforms.

Evolution of Reform Measures over Time

Figure 2.1 presents the evolution of OFRI and the share of countries in the sample with different states of reforms. It highlights significant variations across countries and over time. The multidimensionality of the reform measures and the long time span imply that important episodes, such as the Basel I capital accord or country-specific structural adjustment programs, are covered in the data.

Figure 2.1—Countries by reform category

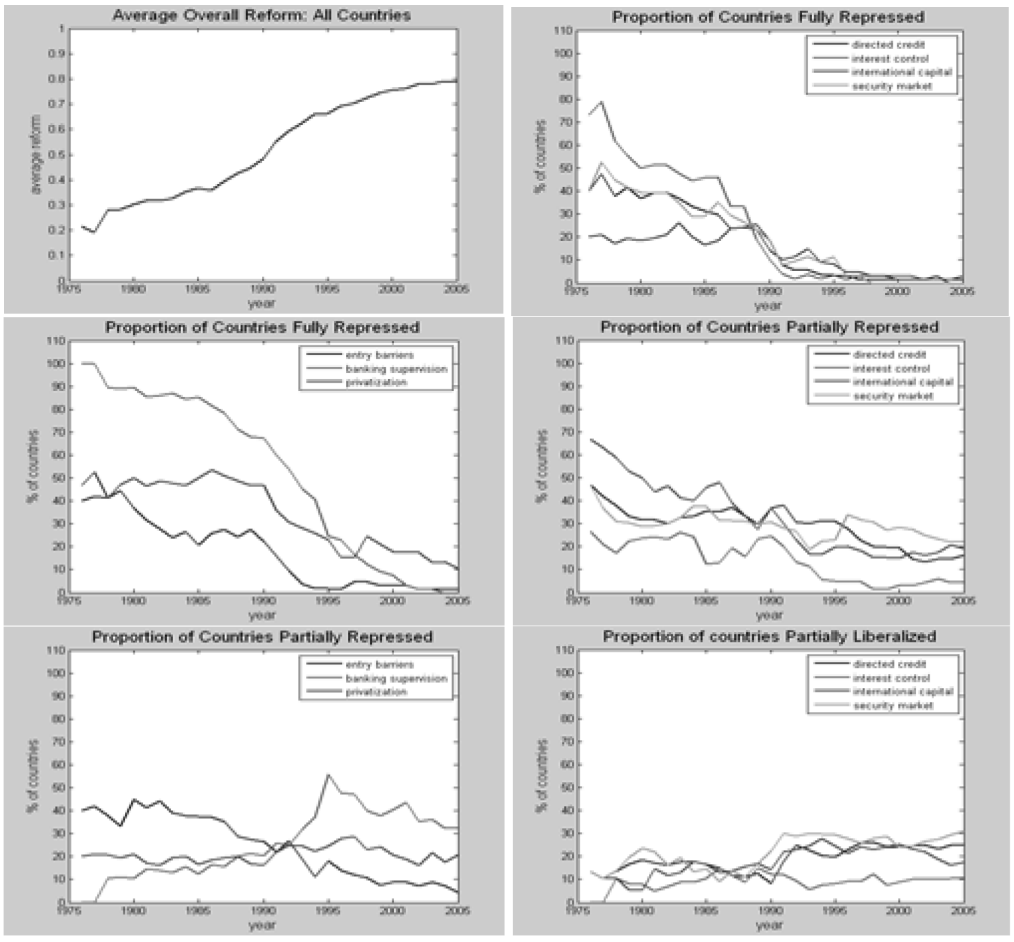
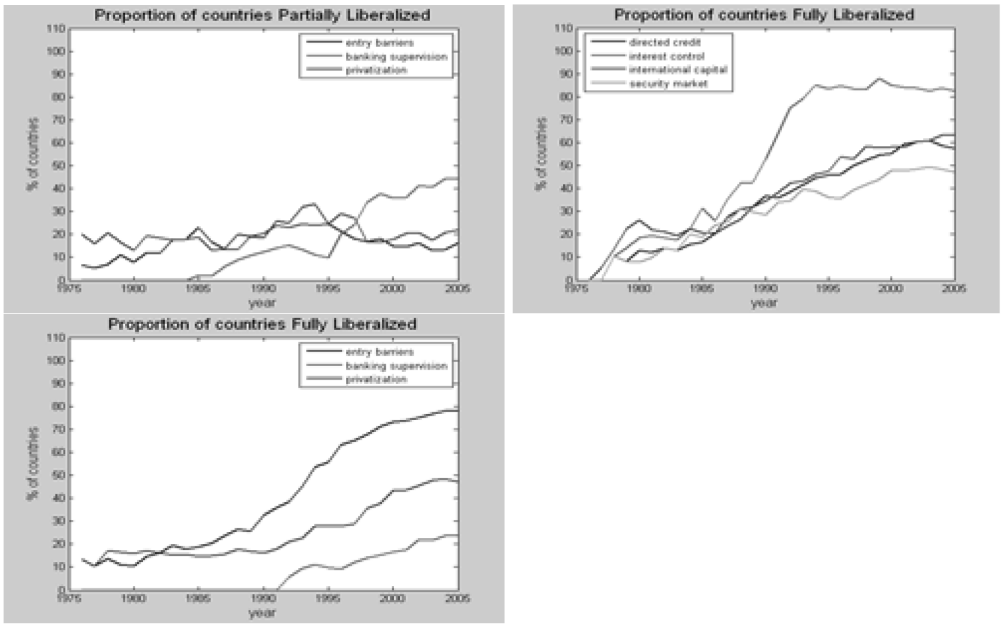


Figure 2.1—Continued



Source: Drawn based on data from Abiad, Detragiache, and Tressel (2010).
Notes: China Included.

The time path of average OFRI across countries shows a clear and continuous trend toward less financial repression (the first panel in Figure 2.1). With specific measures, the intertemporal pattern of reforms reflects a lot of heterogeneity in terms of the proportion of countries in the fully or partially liberalized states (less so in the fully repressed category). Across all measures, the proportion of countries with full repression tends toward zero, except in the measure of privatization of banks, where the declining share settles near 10 percent.

Securities market reforms show a distinctive pattern, wherein the expansion of coverage is among the most sedate compared with other reforms. This is the only reform (that is, equity market liberalization) for which a rigorous analysis of its impact on trade exists (see Manova 2008a, whose analysis covers the period 1980–97). Figure 2.1 shows that for this reform, there is a much more significant change in the number of countries with full or partial liberalization and repression post-1995. A similar case is observed for the privatization measure, with the difference that the declining share of fully repressed countries seems to result in an even reallocation across the other three categories—except that since the late 1990s, the number of countries that are fully liberalized on this measure breaks ranks with the numbers in the two repressed categories.

Moreover, the pace of reform is quite different across categories, the common trend toward less repression notwithstanding. Particularly before the mid-1990s, at each point in time in a cross-section of countries, the package of reforms was somewhat loose. A significant number of countries could be repressed on many fronts while becoming liberalized on some others. At a broader level there are time spans for different countries when different levels (or categories) of financial reforms concurred, and other times when they did not. Sometimes they were sequenced in particular ways and other times in opposite ways. The intensity of reform itself was low (or high) for a sustained period of time.

One of the broadly accepted conclusions in the literature suggests that in order to maximize the gains from capital account liberalization, such liberalization should accompany domestic financial market reforms, such as interest rate deregulation, removal of credit controls, elimination of barriers of entry in the banking sector, and improvement of banking-sector supervision and regulation (Fischer and Reisen 1994; Bergsten and Williamson 1990). Another relative consensus in the literature emphasizes that the privatization of state-owned banks must be done at the same time as or after the development of security

markets and liberalization of capital accounts (see Bicaba 2011). Further, Buiter and Taci (2003) showed that without an efficient domestic banking sector, and deeper and more liquid domestic financial markets, only the well-to-do firms (in terms of their capitalization and liquidity) will likely attract significant amounts of external finance.

Table 2.2 presents the correlations among reform indicators and then of individual reform measures with the value of exports. All individual reform indicators have similar correlation with OFRI, with interest rate deregulation and capital account reforms leading the pack. Among individual reforms, the highest correlation of exports is with reforms related to the securities market. Prima facie, the weakest associations of reforms with trade are found in the case of policies related to reduction of entry barriers and privatization in the banking sector.

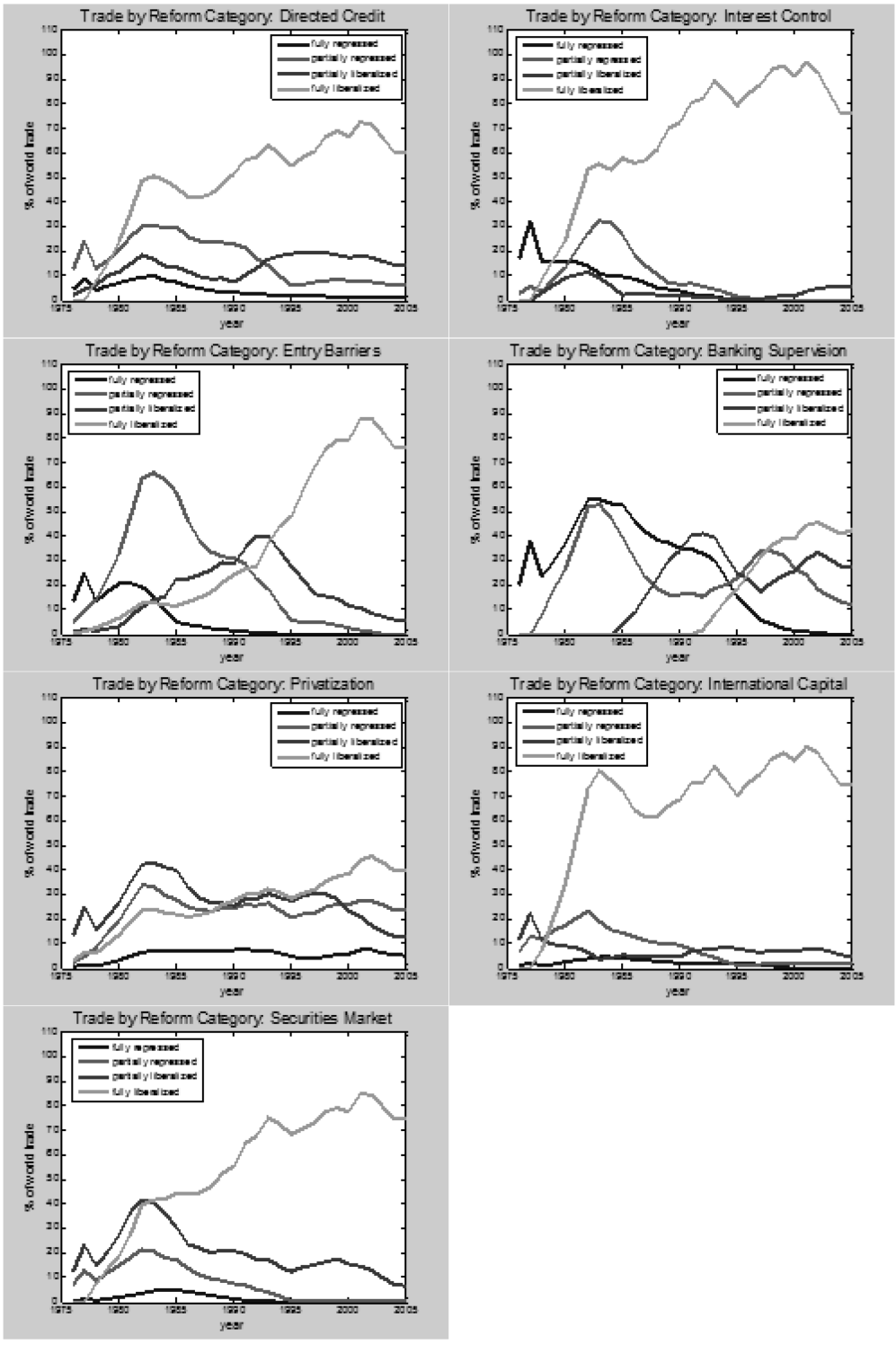
Table 2.2—Correlations among reform indicators and of reform indicators with value of exports

	Exports	Reform index	Directed credit	Interest rate	Entry barriers	Banking super-vision	Privati-zation	Capital account	Securities market
Exports	1.00								
Reform index	0.17	1.00							
Directed credit	0.12	0.74	1.00						
Interest rate	0.11	0.79	0.55	1.00					
Entry barriers	0.07	0.77	0.52	0.53	1.00				
Banking supervision	0.18	0.79	0.51	0.55	0.57	1.00			
Privatization	0.08	0.71	0.47	0.42	0.48	0.48	1.00		
Capital account	0.16	0.82	0.53	0.60	0.53	0.58	0.52	1.00	
Securities market	0.20	0.80	0.50	0.57	0.55	0.61	0.45	0.67	1.00

Source: Author's estimations.

Each panel in Figure 2.2 plots the share in world trade of countries belonging to the four categories for each reform measure. Full liberalization related to directed credit, interest controls, international capital, and equity markets is associated with countries' commanding a significantly larger share in world trade vis-à-vis the share of countries with less or no liberalization. In the case of other reforms, the differences in trade shares are much less stark between fully liberalized exporters and the rest, especially before the middle of 1990s. For much of the period, high-intensity reforms in banking supervision and privatization show weak partial association with an increase in share in global exports.

Figure 2.2—Percentage of world trade by reform category: Five-year moving average



Source: UN Comtrade and Abiad, Detragiache, and Tressel (2010).

Notes: Without China.

China emerges as an outlier, with exceptional trade performance even when the financial reforms in that country are subdued. The OFRI is as low as 0.22 compared with the average in the rest of the world (0.58). Table 2.3 presents shares of China's trade under different stages of financial reforms in a group comprising countries in the same state of financial reform. Note that in none of the reform categories does China qualify as fully liberalized. Under the controls related to banking supervision, privatization, and interest rates, in the set of countries that are fully repressed, China holds a very high share of trade at 40, 32, and 31 percent, respectively. In the cases of international capital flows and securities markets, among the countries in a partially repressed state, China has shares as high as 37 and 41 percent, respectively.

Table 2.3—China's share of world trade under different reform regimes (%)

	Directed credit	Interest rate controls	Banking supervision	Entry barriers	Privatization	International capital	Securities market
Fully repressed	0	40	31	4	32	26	18
Partially repressed	9	13	14	2	0	37	41
Partially liberalized	17	28	0	10	0	0	8
Fully liberalized	0	0	0	0	0	0	0

Source: Author's estimations.

Note: Each cell in the table presents the share of China's trade in a particular reform of a particular intensity. For example, the cell corresponding to directed credit and partially liberalized intensity shows the number 17, which implies that of the total trade from the countries that are partially liberalized in directed credit, China's exports account for 17%.

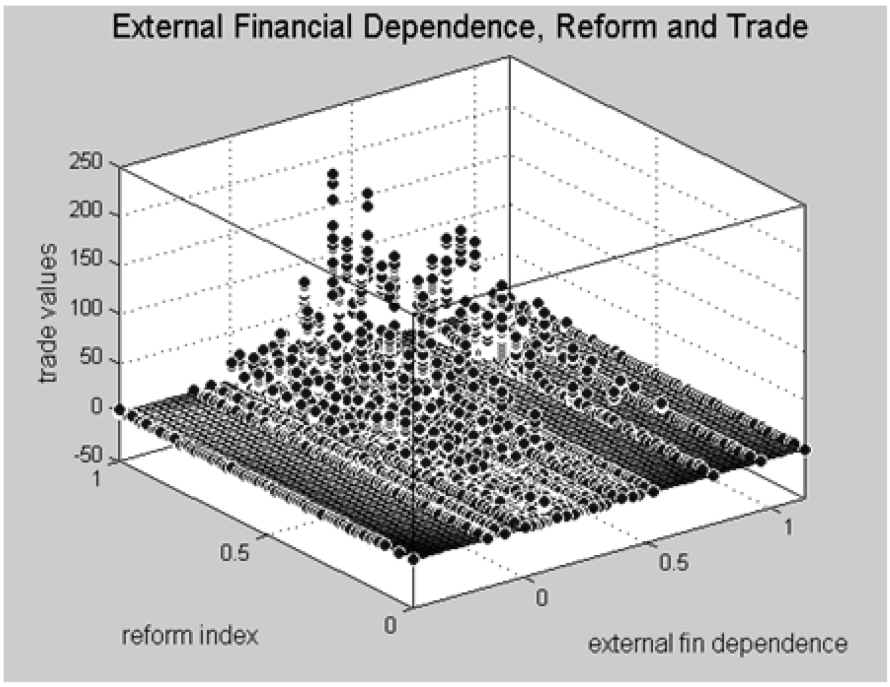
Further, countries in the same industry tend to have higher numbers of export destinations if financial markets are liberalized.[5] The effect on the extensive margin is most pronounced in the cases of securities market and international capital reforms. The number of destinations is marginally higher for liberalized interest rate controls. The number of destinations for full liberalization is not unambiguously higher for other reforms. Assuming that every entry into a new market involves fixed costs, one could hypothesize that, ceteris paribus, expansion of trade, when contributed more by the extensive margin, could be comparatively intensive in need for finance. Consequently, the impact of reforms could be more pronounced if the number of destinations for a particular industry in a given country is higher.

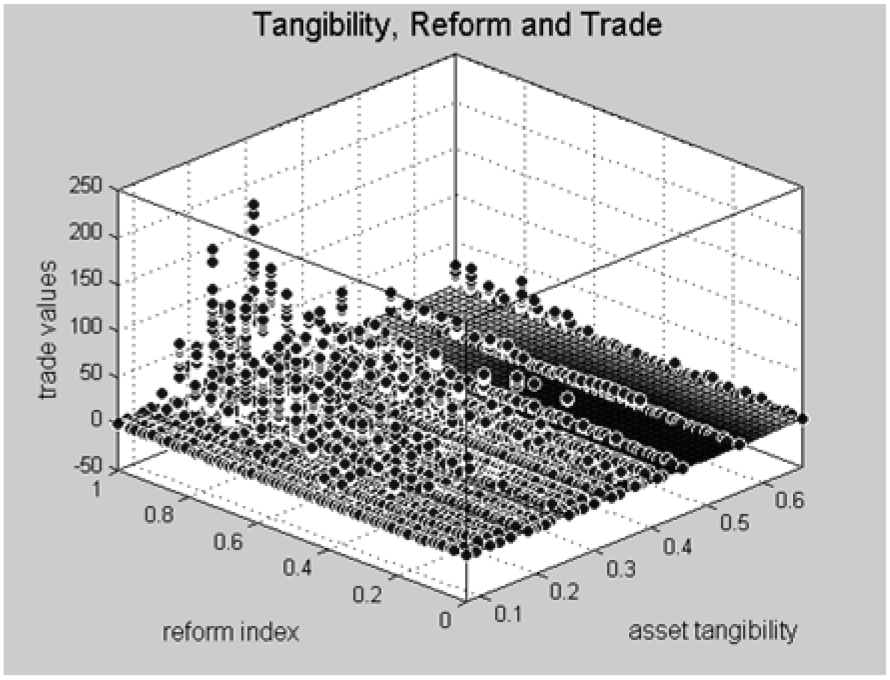
Following earlier literature, we choose the external financial dependence and asset tangibility at the industry level from Braun (2003). The former is the ratio of capital expenditures minus cash flow from operations to capital expenditures, and the latter is the share of net property, plant, and equipment in total book-value assets. The value is based on the median firm in each sector in the United States. The data have been compiled based on Compustat for different years. Given the technological determinism in these variables, following Rajan and Zingales (1998), we assume that at least in a relative sense across industries, the same structure of external capital dependence and asset tangibility holds in all countries. Across industries there is much greater variation in external capital dependence than in asset tangibility.

The three-dimensional pictures in Figure 2.3 show the interplay between financial reforms, industry characteristics (in terms of external capital dependence and asset tangibility), and trade performance: There is concentration of exports toward greater reform and higher external financial dependence, and toward reform and lower asset tangibility, respectively. The plots are for overall reform index, but similar patterns exist for each individual reform as well.

[5] Figures available upon request from the authors.

Figure 2.3—Industry financial structure, reform, and trade





Source: Braun 2003 and UN Comtrade.

3. ESTIMATION: EFFECTS OF FINANCIAL REFORMS ON EXPORTS

Industry Financial Structure and Unobserved Heterogeneities

We estimate the impact of different types of reforms on exports using a framework that controls for unobserved time-varying characteristics of the exporters. Among important exporter and time-varying characteristics are different financial reforms (as well as other reforms related to trade policy, for example) themselves. Inclusion of exporter–time fixed effects is a distinct improvement upon the specifications in earlier studies, such as that of Manova (2008a). Exporter–time fixed effects also include variables such as incomes in the exporting country and, most importantly, time-varying unobserved country-specific characteristics such as technological progress, institutional quality, country-time-specific events, and the like.

In the specification below, with the inclusion of exporter–time fixed effects, $\theta_j * t$, the effect of any financial reform measure per se, cannot be identified. Industry-level unobserved heterogeneities, such as level of concentration in the industry, are accounted for with θ_s, which also subsumes the observed characteristics, such as asset tangibility and external capital dependence. Consequently, we adopt the following identification strategy. For each reform category *k* we estimate the following equation:

$$\ln(X_{jt}^{s}) = \alpha_k + \sum_{m=1}^{3} \beta_k^m \left(R_{jkt}^m * EFD_s\right) + \sum_{m=1}^{3} \gamma_k^m \left(R_{jkt}^m * AT_s\right) + \theta_j * t + \theta_s + \xi_{jt}^{s}, \qquad (1)$$

where X_{jt}^{s} is country *j*'s exports in industry s at time t, R_{jkt}^m denotes the *k*th reform in country j of intensity m at time t (for example, partially repressed state of directed credit at time *t* in country *j*), EFD_s denotes the external financial dependence in sector s, AT_s denotes the asset tangibility in sector s, and ξ is the error term. The omitted category for each reform is the one corresponding to fully repressed. Note that in each reform regression, the exporter–time fixed effect also accounts for all other measures of reform, thereby conditioning the effect of each policy change on the state of every other reform policy.

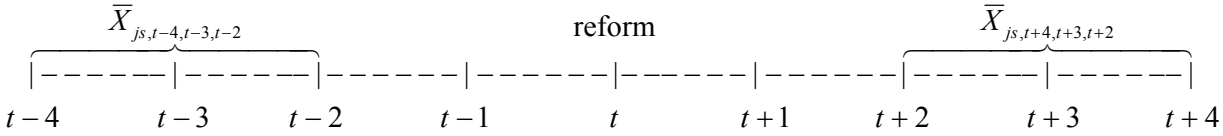
For each of the seven regressions, our coefficients of interest are the different β_k^m and γ_k^m. A priori we expect $\beta_k^m > 0 \ \forall k,m$ and $\gamma_k^m < 0 \ \forall k,m$; that is, we expect reforms with differing intensities to increase exports relatively more in industries with higher external capital dependence and fewer tangible assets. There is no prior expectation for the relative sizes of β_k^m and γ_k^m, although one could conjecture that if intangible assets restrict collateralization then nonbanking reforms could be comparatively important for industries with soft assets. Finally, one would expect greater changes in exports from high intensity of reforms, although, if diminishing returns set in, this may not always hold.

With this specification, the identification of the effect of financial reforms on trade comes from the variation within countries across industries (in the form of external financial dependence and share of tangible assets). Any variable that is industry specific or has only within-country variation over time cannot be identified in our framework.

Assessing Lagged Effects of Reforms

It is possible that the effects of financial reforms are realized with a gestation lag. If time period *t* represents the initiation of any reform, then we want to determine whether the effects are more pronounced some time periods later. For tractability, first we collapse the reform intensity measures into two categories: repressed (if fully or partially repressed) and liberalized (if partially or fully liberalized).

The outcome for trade flows that we consider for assessing potential lagged effects entails comparing the average of three time-period trade flows prior to reforms (excluding the immediate pre-reform period) with the same average after the reforms (excluding the immediate postreform period). If reforms were anticipated, then the effects on trade flows can fructify before the reforms are actually initiated. Following Trefler (2004) and Manova (2008a), we explore the question of lagged effects by conducting an event study. The timeline for the event study is given as follows:



The event study estimation equation for reform k that changed from a repressed to a liberalized state at time t is given as

$$\overline{X}_{js,t+4,t+3,t+2} - \overline{X}_{js,t-4,t-3,t-2} = \pi_k + \phi_k \, EFD_s + \varphi_k \, AT_s + \theta_j * t + \varsigma_{jst}, \tag{2}$$

where $\overline{X}_{js,t+4,t+3,t+2} - \overline{X}_{js,t-4,t-3,t-2}$ denotes the change in three-year average of exports in industry s post- and pre-reform. Since these differences can be negative as well as zero, the dependent variable is not specified in logs. Also, since the difference in trade is measured for the same industry, industry fixed effects are washed away in this specification. The equation, as before, includes exporter–time fixed effects $\theta_j * t$ and therefore does not include changes in the exporter's GDP. Since the change in exports is being assessed around an event for each of the seven indicators, only observations that include reform of the particular type in each observation are retained.

4. RESULTS

Results from Primal Regressions

Following the discussion above, in all specifications, estimations have been done by including as well as excluding China. In each regression, standard errors are clustered at exporter–year level. We start by assessing the effect of the overall financial reform index (OFRI). Table 4.1 presents the results of panel regressions of 84 countries in 28 industries for the period 1976–2005 to estimate the effect of OFRI on exports. There is evidence of strong effects of interaction of the reform index with both external capital dependence and asset tangibility, with the expected signs. For countries that improved in overall reforms in the financial markets, there is greater expansion in exports of industries with greater external financial dependence or a bigger share of soft assets in their portfolios. Without China in the sample, both the effects are stronger.

Table 4.1—Estimates of the effects of financial reform index on trade

	Full sample	No China
Index*(external financial dependence)	1.927***	1.989***
	(0.0967)	(0.0982)
Index*(asset tangibility)	-1.180***	-1.431***
	(0.251)	(0.249)
Constant	6.126***	6.083***
	(0.0645)	(0.0658)
Industry fixed effect	yes	yes
Exporter–time fixed effect	yes	yes
Observations	47,496	46,930
R-square	0.796	0.794
Mean Squared Error	1.574	1.579

Source: Author's estimations.
Notes: *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$. Standard errors in brackets. Standard errors are clustered over each exporter for each year.

Given that there is wide variation across industries in terms of external capital dependence as well as asset tangibility, the effects of exports are likely to have been quite diverse. Relative to industries with low external capital dependence, such as nonferrous metals, the effect on exports would be nearly 10 times higher than in high-dependence industries, such as plastic products.

In Table 4.2 we make two significant changes. First, we break out the financial reform index into its seven constituents. Second, we incorporate the intensity of reform in each constituent by interacting industry characteristics with dummies for different degrees of reform. Recall that in the regression for each individual measure, other reforms are controlled in the background by being subsumed into the exporter–time fixed effects. Since fully repressed is the omitted category, all the effects are measured with respect to that state.

Table 4.2—Estimates of the effects of financial reform with exporter–time fixed effect: Including China

	Directed credit	Interest rate controls	Banking supervision	Entry barriers	Privatization	International capital	Securities market
Partially repressed*(external financial dependence)	0.354***	0.293**	0.490***	0.250**	0.573***	0.577***	0.191*
	(0.102)	(0.124)	(0.0775)	(0.108)	(0.0849)	(0.121)	(0.114)
Partially repressed*(asset tangibility)	-0.0441	-1.047***	-0.354*	-0.360	0.229	0.477	-0.560**
	(0.228)	(0.369)	(0.205)	(0.274)	(0.223)	(0.309)	(0.273)
Partially liberalized*(external financial dependence)	0.588***	0.856***	0.895***	0.346***	1.025***	1.060***	0.724***
	(0.108)	(0.133)	(0.0792)	(0.112)	(0.0905)	(0.127)	(0.114)
Partially liberalized*(asset tangibility)	-0.739***	-0.0162	-0.703***	-0.477*	-0.447*	-1.041***	-2.053***
	(0.268)	(0.397)	(0.208)	(0.256)	(0.234)	(0.321)	(0.278)
Fully liberalized*(external financial dependence)	1.235***	0.913***	1.164***	0.729***	1.101***	1.484***	1.430***
	(0.0910)	(0.0918)	(0.0706)	(0.0849)	(0.0757)	(0.116)	(0.105)
Fully liberalized*(asset tangibility)	-0.471**	-0.426*	-0.769***	0.0413	-0.580***	-0.698**	-1.887***
	(0.222)	(0.248)	(0.215)	(0.235)	(0.211)	(0.278)	(0.245)
Constant	6.510***	6.533***	6.753***	6.780***	6.565***	6.227***	6.523***
	(0.0782)	(0.0771)	(0.0480)	(0.106)	(0.0571)	(0.0971)	(0.0908)
Industry fixed effect	yes	yes	yes	yes	yes	yes	yes
Exporter–time fixed effect	yes	yes	yes	yes	yes	yes	yes
Observations	47,496	47,496	47,496	47,496	47,496	47,496	47,496
R-square	0.795	0.794	0.795	0.794	0.795	0.796	0.797
MSE	1.577	1.580	1.579	1.582	1.577	1.574	1.570

Source: Author's estimations.

Notes: *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$. Standard errors in brackets. Standard errors are clustered over each exporter for each year.

Results in Table 4.2 show that for industries with high external capital dependence, the effects of reforms vary positively with reform intensity. Relative to a fully repressed case, the effect of full liberalization is most pronounced for equity market reforms. The coefficient of full liberalization interacted with external capital dependence is nearly 7.5 times that of partial repression. The second-highest accentuation in relative effect from full liberalization happens in the case of directed credit, with a coefficient 3.5 times larger for the highest degree of reforms. The lowest estimated increase in effects of full liberalization for industries with high external capital dependence is in the case of privatization of banks, with the coefficient smaller than 2 times in magnitude.

Comparing across reforms, the biggest effects of both partial and full liberalization for industries with high external capital dependence are obtained for reforms related to international capital flows. Securities market reforms along differing intensities probably have the most nonlinear effects on exports for industries with high external capital dependence.

In the case of asset tangibility, results demonstrate that in four of the seven categories, low-intensity reforms (that is, partial repression compared with full repression) have had no significant effect on exports in industries with low levels of assets to offer as collateral. In cases of partial and full liberalization, only reforms related to interest rate controls and privatization of banks, respectively, have an insignificant effect on exports of industries with soft assets. The effect on the exports of such industries is most striking in the case of securities market reforms of higher degrees. With only partial liberalization (relative to a fully repressed securities market), the exports of industries with average asset tangibility will go up by as much as US$2 million.

Table 4.3 repeats the exercise in Table 4.2 but excludes China. A few interesting facts emerge regarding the disproportionate influence of China. The weak effect of low-degree reforms in securities markets turns out to be insignificant (for interaction with external capital dependence as well as asset tangibility) when China is excluded. Since China has never been fully liberalized in any category of reforms but is an exceptional exporter, the effect of full liberalization interacted with pertinent industry characteristics tends to have relatively greater effects without China.

Table 4.3—Estimates of the effects of financial reform with exporter–time fixed effect: Excluding China

	Directed credit	Interest rate controls	Banking supervision	Entry barriers	Privatization	International capital	Securities market
Partially repressed*(external financial dependence)	0.341***	0.336***	0.496***	0.264**	0.617***	0.588***	0.166
	(0.103)	(0.127)	(0.0780)	(0.112)	(0.0858)	(0.123)	(0.116)
Partially repressed*(asset tangibility)	0.0722	-1.271***	-0.383*	-0.527*	0.0515	0.487	-0.443
	(0.228)	(0.372)	(0.206)	(0.272)	(0.224)	(0.309)	(0.273)
Partially liberalized*(external financial dependence)	0.561***	0.900***	0.888***	0.384***	1.070***	1.103***	0.728***
	(0.109)	(0.136)	(0.0807)	(0.114)	(0.0914)	(0.129)	(0.115)
Partially liberalized*(asset tangibility)	-0.631**	-0.221	-0.634***	-0.730***	-0.625***	-1.196***	-2.097***
	(0.268)	(0.400)	(0.207)	(0.254)	(0.234)	(0.321)	(0.280)
Fully liberalized*(external financial dependence)	1.235***	0.971***	1.170***	0.768***	1.145***	1.527***	1.440***
	(0.0910)	(0.0951)	(0.0711)	(0.0882)	(0.0767)	(0.118)	(0.106)
Fully liberalized*(asset tangibility)	-0.471**	-0.693***	-0.820***	-0.213	-0.758***	-0.853***	-1.949***
	(0.222)	(0.251)	(0.215)	(0.233)	(0.211)	(0.278)	(0.246)
Constant	6.501***	6.484***	6.741***	6.794***	6.523***	6.186***	5.697***
	(0.0782)	(0.0803)	(0.0486)	(0.111)	(0.0583)	(0.0994)	(0.0842)
Industry fixed effect	yes	yes	yes	yes	yes	yes	yes
Exporter–time fixed effect	yes	yes	yes	yes	yes	yes	yes
Observations	46,930	46,930	46,930	46,930	46,930	46,930	46,930
R-square	0.793	0.793	0.793	0.792	0.793	0.794	0.795
MSE	1.583	1.585	1.584	1.588	1.582	1.579	1.575

Source: Author's estimations.

Notes: *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$. Standard errors in brackets. Standard errors are clustered over each exporter for each year.

Event Studies for Different Reforms: Export Values and Number of Destinations

Event studies in the context of reforms are motivated by the fact that there could be unobserved systemic differences across countries (or country-industry pairs) in the economic environment at the time of a policy change (see Manova 2008a and Trefler 2004). We cannot include (country) × (industry) × (time) fixed effects, since they would leave no variation to capture the effects of reforms. Our specification with exporter–time fixed effects can control for country-specific heterogeneity at the time of reforms.

Further, event studies can be used to allow for effects of reforms that are not contemporaneous. In anticipation of reforms, the effects could be ushered in earlier than the enactment of the policy, or they could become effective with a lag, or both. Event studies are useful in capturing the noncontemporaneous effects of each reform.

Recall from the specification in equation (2) that in an event study we revert to binary measures of reforms and that the dependent variable is no longer in logs since exports can take on nonpositive values. The event study results (Panel A, Table 4.4) confirm the findings for most reforms. Relative to the three-year average of exports before the commencement of a reform, except in the case of interest rate controls, all policy changes increased average exports, for three years postreform, of industries with relatively high external capital dependence. Note that the three-year averages exclude the immediate pre-reform and postreform periods. In the case of asset tangibility, there is no significant increase in exports around events of reforms related to interest rate controls and securities market reforms.

Table 4.4—Event study estimates of the effects of financial reform

Panel A: Exports	Directed credit		Interest rate controls	Banking supervision	Entry barriers		Privatization	International capital	Securities market
	With China	Without China			With China	Without China			
External financial dependence	1236**	899.5**	584.1	1087***	1128***	910.1***	696.1**	410.2**	413.5**
	(483.50)	(355.50)	(358.80)	(392.90)	(368.60)	(303.20)	(271.90)	(177.30)	(196.40)
Asset tangibility	-1775**	-1260**	-800.1	-1415**	-1490**	-1131**	-959.0**	-483.6**	-288.5
	(724.10)	(516.00)	(608.80)	(550.70)	(602.60)	(493.50)	(377.20)	(230.10)	(237.60)
Constant	250.4**	179.0**	120.2	156.4*	154.5	493.9***	100.4*	81.86	20.45
	(109.60)	(83.60)	(132.60)	(85.13)	(104.80)	(96.81)	(50.28)	(55.71)	(66.02)
Industry fixed effect	yes	yes	yes	yes	yes	yes	yes	yes	yes
Exporter–time fixed effect	yes	yes	yes	yes	yes	yes	yes	yes	yes
Observations	820	792	923	897	971	943	646	986	738
Number of countries	43	42	47	38	42	41	35	42	36
R-square	0.191	0.173	0.115	0.202	0.225	0.222	0.183	0.149	0.138
MSE	2520	2018	2044	2554	2623	2410	1381	1123	1118

Panel B: Number of destinations	Directed credit		Interest rate controls	Banking supervision	Entry barriers		Privatization	International capital	Securities market
	With China	Without China			With China	Without China			
External financial dependence	5.152***	5.525***	5.086***	5.340***	7.306***	7.733***	6.770***	6.007***	8.137***
	(1.19)	(1.16)	(0.92)	(1.38)	(1.47)	(1.45)	(1.74)	(1.24)	(1.57)
Asset tangibility	-0.418	-1.834	-0.483	-5.523**	0.933	-0.493	-7.546**	-2.368	-4.731
	(2.81)	(2.50)	(2.73)	(2.17)	(3.34)	(3.10)	(3.26)	(2.31)	(3.04)
Constant	5.268***	5.603***	0.457	5.490***	2.427**	12.87***	3.592***	4.509***	6.719***
	(0.90)	(0.86)	(0.90)	(0.60)	(0.99)	(0.94)	(0.96)	(0.66)	(0.81)
Industry fixed effect	yes	yes	yes	yes	yes	yes	yes	yes	yes
Exporter–time fixed effect	yes	yes	yes	yes	yes	yes	yes	yes	yes
Observations	820	792	923	897	971	943	646	986	738
Number of countries	43	42	47	38	42	41	35	42	36
R-square	0.507	0.503	0.552	0.581	0.552	0.558	0.625	0.545	0.527
MSE	8.362	8.242	8.27	8.214	9.567	9.475	7.9	8.195	8.958

Source: Author's estimations.

Notes: *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$. Standard errors clustered over each exporter for each year. For the event study we need observations for four years before and after the year of reform. China does enter into the reform category (partially or fully liberalized) in interest rate controls and securities markets. However, these reforms took place in 2004 and our sample ends in 2005, which means that we don't have enough observations for event study analysis. China therefore appears in only two of the categories, directed credit and entry barriers. With exporter–time fixed effect: changes in three-year averages.

Again, China singularly makes a lot of difference in the estimates of the effects on exports, especially for two reforms, those related to entry barriers for banks and to directed credit. Based on external capital dependence as well as asset tangibility, allowing for both anticipated responses and lagged effects of policies, the estimated changes in industrial exports are smaller without China.

In general, event studies establish that with most financial reforms there are significant increases in exports for industries with certain financial structures. The studies do not, however, delineate the source of expansion of trade with reforms. It is now well accepted that margins in trade are a function of firm heterogeneity and the fixed costs of exporting. Easing of credit constraints in that case should relate directly to the number of destinations served by the affected exporters (in our case, ones with high external capital dependence and less holding of collateralizable assets).

As a secondary test for the financial link to exporting, we conduct a second event study with changes in the number of destinations across periods separated by reform episode. Results are presented in Panel B of Table 4.4. Industries with high external capital dependence experience significant increases in numbers of export destinations for all types of reforms. The effects on industries with soft assets are weaker and are significant only for reforms relating to banking supervision and privatization of banks. The regressions in event studies related to the number of destinations fit the data better than do those related to export values.

Robustness Checks: Separate Exporter, Time, and Industry Fixed Effects

In the analysis above, the interaction of the industry's financial structure with measures of reforms was mandated in order to identify the effects of financial reforms. Inclusion of exporter–time fixed effects underlines our preferred specification for estimating the effects of financial reforms to account for time-varying unobserved characteristics of the exporter. If exporter, industry, and time fixed effects were included separately, then the effect of each level of reforms for every category could be identified (see Table B.1, in Appendix B). Without exporter–time fixed effects, the GDP of the exporting country and trade liberalization measures now would also appear in the specification. In these regressions, for each reform, we need to control for all the other reforms. For example, in the regression for directed credit, the specification will incorporate 18 dummies from the remaining 6 types of reform, each reform with 3 dummy variables—partially repressed, partially liberalized, and fully liberalized—capturing the effect of financial reform on the "average" sector.

The results generally support the ones presented in Table 4.2. They also point out the importance of exploiting the variation by industry in financial structures. While several of the reform measures have insignificant effects on the average sector, interaction with industry characteristics produces many significant effects along expected lines, akin to results in Table 4.2.

Estimates of Effects of Financial Reforms for the Time Period 1986–95

Like several other studies, we have used industry-level measures of external capital dependence and asset tangibility from Braun (2003). These measures for the industries are based on data for all publicly traded United States–based companies from Compustat. Both measures are constructed as averages for the 1986–95 period, as in Braun (2003). Researchers frequently use these measures for much longer time periods, assuming that they are stable over time (Manova 2008a). So an issue remains as to how stable (in a relative sense) these industry-level measures are for a longer period of time such as the one here, that is, 1976–2005. For a long time interval, issues might arise regarding changes in both external capital dependence and asset tangibility because of factors such as technological change. Note, however, in the cross-industry variation that is central to our identification strategy, the relative and not absolute values of either of the two characteristics of the industries matter.

To confirm that results are not driven by changing financial structures or asset portfolios of industries, we confine the analysis to the period 1986–95. As before, the analysis is done first with China included and then with China excluded. Note that studies that have used Braun (2003) generally do not conduct a similar robustness check.

Results presented in Tables B.2 and B.3 (Appendix B) show that for most reforms in industries with higher external capital dependence or lower asset tangibility, with few exceptions, there are significant increases in exports, as estimated before. Based on statistical significance, in the case of interaction with external capital dependence, only the partial repression category of securities market reforms is different in the smaller sample. In the bigger sample this category of reform was only weakly significant. In the case of asset tangibility, there are more differences in terms of statistical significance. Note that although financial reforms vary less in the smaller sample, the previous results are still strongly reinforced.

5. CONCLUSIONS

This paper presents new evidence on the effects of different financial reforms related to credit and interest rate controls, banking sector reforms, and capital markets on exports. Using a robust methodology that controls, most importantly, for time-varying observed and unobserved factors in the exporting country, and exploits the variation in industry characteristics, we identify the effects of financial reforms on exports. Industries most in need of external finance, or with asset structures that limit collateralization, or both, are found to experience greater expansion of their exports.

The dataset from Abiad, Detragiache, and Tressel (2010) that we utilize also enables us to assess differences in impacts by intensity of reform. For each reform category, we estimate the effects for three degrees of reform with respect to extreme financial repression, conditional on all the other reforms. The demanding empirical specification that we employ pitches for the links between financial reforms and exports to be causal. Several policy measures that could expand exports—such as, among others, administering of exchange rates by exporting countries and membership in preferential trade arrangements—as well as continuously changing institutional and demographic characteristics, are all accounted for in the empirical model.

Through an event study we demonstrate that there are lagged effects for some reforms and, as a fallout of reforms, significant changes in exports would have occurred along the extensive margin. The results on significant expansion in the number of destinations served by exporters provide an alternative basis for the working of the finance link. This follows from a well-recognized fixed-costs paradigm in international trade literature, wherein matters such as those related to market entry, meeting of product specification, and the like entail fixed costs in exporting. With fixed costs, the number of destinations served can be positively affected by reforms that mitigate a credit crunch.

Overall, the analysis here brings forth the importance of looking at multiple reforms. Apart from issues of debt versus equity financing, domestic versus international capital, liberalization and prudential regulation, the results bring to the front some classical issues in policymaking in the context of international trade. These are sequencing of reforms, complementarities between policy measures, and size of reforms. Though in general we do not find any evidence of front-loading of effects on exports, there is evidence of some nonlinearity with respect to degrees of reforms that are relatively more pronounced in some cases, such as securities market reforms.

APPENDIX A: SUPPLEMENTARY TABLES

Table A.1—List of countries in the full sample

Algeria	France	Netherlands
Argentina	Georgia	New Zealand
Australia	Germany	Nicaragua
Austria	Ghana	Nigeria
Azerbaijan	Greece	Norway
Bangladesh	Guatemala	Pakistan
Belarus	Hong Kong, China	Paraguay
Belgium	Hungary	Peru
Bolivia	India	Philippines
Brazil	Indonesia	Poland
Bulgaria	Ireland	Portugal
Burkina Faso	Israel	Russian Federation
Cameroon	Italy	Senegal
Canada	Jamaica	Singapore
Chile	Japan	South Africa
China	Jordan	Spain
Colombia	Kazakhstan	Sri Lanka
Costa Rica	Kenya	Sweden
Cote d'Ivoire	Korea, Rep.	Switzerland
Czech Republic	Kyrgyz Republic	Thailand
Denmark	Latvia	Tunisia
Dominican Republic	Lithuania	Turkey
Ecuador	Madagascar	United Kingdom
Egypt, Arab Rep.	Malaysia	United States
El Salvador	Mexico	Uruguay
Estonia	Morocco	Venezuela
Ethiopia (excludes Eritrea)	Mozambique	Zimbabwe
Finland	Nepal	

Source: Compiled by authors.

Table A.2—List of countries in the event history analysis under different reform regimes

Directed credit	Interest rate controls	Banking supervision	Entry barriers	Privatization	International capital	Securities market
Algeria	Albania	Algeria	Albania	Australia	Argentina	Argentina
Argentina	Algeria	Argentina	Australia	Austria	Australia	Bangladesh
Australia	Argentina	Australia	Canada	Bolivia	Austria	Bolivia
Bangladesh	Australia	Austria	Chile	Bulgaria	Bangladesh	Brazil
Bolivia	Austria	Bolivia	China	Burkina Faso	Brazil	Chile
Cameroon	Azerbaijan	Brazil	Czech Republic	Cameroon	Bulgaria	Colombia
China	Bangladesh	Burkina Faso	Denmark	Colombia	Burkina Faso	Czech Republic
Costa Rica	Bolivia	Cameroon	Egypt, Arab Rep.	Czech Republic	Chile	Denmark
Czech Republic	Brazil	Canada	El Salvador	El Salvador	Colombia	Ecuador
Dominican Repub.	Bulgaria	Colombia	Estonia	Estonia	Costa Rica	Egypt, Arab Rep.
Ecuador	Colombia	Costa Rica	France	France	Czech Republic	Finland
Egypt, Arab Rep.	Costa Rica	Denmark	Germany	Georgia	Denmark	Georgia
El Salvador	Denmark	Ecuador	Greece	Guatemala	Ecuador	Ghana
Ethiopia	Ecuador	Egypt	Hong Kong	Hungary	Egypt, Arab Rep.	Greece
France	Egypt, Arab Rep.	El Salvador	Hungary	Ireland	El Salvador	Hungary
Georgia	El Salvador	France	India	Israel	Finland	India
Greece	Finland	Germany	Ireland	Italy	France	Indonesia
Guatemala	France	Indonesia	Israel	Jamaica	Greece	Israel
Hungary	Greece	Israel	Italy	Kazakhstan	Guatemala	Jamaica
India	Guatemala	Italy	Jamaica	Kenya	Hungary	Korea, Rep.
Indonesia	Hong Kong	Jamaica	Japan	Korea, Rep.	India	Latvia
Ireland	India	Japan	Jordan	Kyrgyz Republic	Indonesia	Lithuania
Israel	Indonesia	Kenya	Kazakhstan	Lithuania	Israel	Malaysia
Italy	Ireland	Korea, Rep.	Latvia	Madagascar	Italy	Mexico
Japan	Jamaica	Malaysia	Lithuania	Malaysia	Jamaica	Morocco
Jordan	Japan	Mexico	Madagascar	Mexico	Kenya	Netherlands
Kazakhstan	Jordan	Morocco	Malaysia	Mozambique	Korea, Rep.	Norway
Korea, Rep.	Kenya	New Zealand	Mexico	New Zealand	Madagascar	Pakistan
Kyrgyz Republic	Korea, Rep.	Nicaragua	Netherlands	Nicaragua	Mexico	Paraguay
Lithuania	Madagascar	Peru	New Zealand	Paraguay	Morocco	Peru
Malaysia	Mexico	Philippines	Nigeria	Peru	Netherlands	Philippines
Mexico	Morocco	Portugal	Norway	Philippines	New Zealand	Portugal
Morocco	Mozambique	Senegal	Pakistan	Senegal	Nicaragua	Spain
Mozambique	Nicaragua	Singapore	Peru	South Africa	Norway	Sri Lanka
New Zealand	Nigeria	Sri Lanka	Poland	Thailand	Peru	Sweden

Table A.2—Continued

Directed credit	Interest rate controls	Banking supervision	Entry barriers	Privatization	International capital	Securities market
Nigeria	Norway	Sweden	Portugal		Philippines	Thailand
Pakistan	Pakistan	Thailand	Singapore		Poland	
Peru	Paraguay	United Kingdom	Spain		Portugal	
Philippines	Peru		Sweden		Senegal	
Senegal	Philippines		Switzerland		Spain	
Spain	Portugal		United Kingdom		Sri Lanka	
Sweden	Senegal		United States		Sweden	
Thailand	South Africa					
	Spain					
	Sweden					
	Thailand					
	United States					

Source: Compiled by authors.

APPENDIX B: SEVEN DIMENSIONS OF FINANCIAL REFORM

1. Directed credit: Countries often require that a minimum amount of bank lending be directed toward certain "priority" sectors (based on the respective industrial policy) or toward the government (for purposes of financing budget deficits). Occasionally these directed credits are required to be extended at subsidized rates. Additionally, governments may impose excessively high reserve requirements, beyond what can be reasonably expected for prudential purposes, and reserves may not be remunerated at market rates of return. The questions used to guide the coding of this dimension are the following: Are there minimum amounts of credit that must be channeled to certain sectors, or are there ceilings on credit to other sectors? Are directed credits required to carry subsidized rates? How high are reserve requirements? Loosening of these restrictions indicates reform.

2. Interest rate controls: In the most restrictive case, the government specifies both lending and deposit rates by fiat, or equivalently, sets ceilings or floors tight enough to be binding in most circumstances. An intermediate regime allows interest rates to fluctuate within a band. Interest rates are considered fully liberalized when all ceilings, floors, or bands are eliminated.

3. Banking supervision: This is the only measure in which a greater degree of government intervention is considered reform. The questions used to derive this measure are these: Does a country adopt risk-based capital adequacy ratios based on the Basel I capital accord? Is the banking supervisory agency independent from the executive's influence and does it have sufficient legal power? Are certain financial institutions exempt from supervisory oversight? How effective are on-site and off-site examinations of banks?

4. Privatization: The share of banking-sector assets controlled by state-owned banks reflects governments' controls over credit allocation. Lowering this share indicates reform. Thresholds of 50 percent, 25 percent, and 10 percent are used to delineate the grades between full repression and full liberalization.

5. Entry barriers: Entry barriers may take the form of outright restrictions on the participation of foreign banks, restrictions on the scope of banks' activities, restrictions on the geographic area where banks can operate, or excessively restrictive licensing requirements. Removal of these restrictions indicates reform.

6. International capital: These restrictions include multiple exchange rates for various transactions as well as transaction taxes or outright restrictions on inflows, outflows, or both, specifically regarding financial credits. Lowering of these restrictions indicates reform. These criteria are used to measure reform: Is the exchange rate system unified? Does a country set restrictions on capital inflow? Does a country set restrictions on capital outflow?

7. Securities market: Reform indicates policies to encourage and develop securities markets. These policies include auctioning of government securities, establishment of debt and equity markets, establishment of a security commission, tax incentives or development of depository and settlement systems, development of the derivatives markets, deregulation of portfolio investments and pension funds, deregulation of stock exchanges, and opening up the equity market to foreign investors.

Table B.1—Estimates of the effects of financial reform

	Directed credit	Interest rate controls	Banking supervision	Entry barriers	Privatization	International capital	Securities market
Log of GDP	0.169***	0.168***	0.169***	0.170***	0.169***	0.170***	0.168***
	(0.05)	(0.05)	(0.05)	(0.05)	(0.05)	(0.05)	(0.05)
Trade liberalization	-0.160***	-0.161***	-0.161***	-0.162***	-0.163***	-0.160***	-0.162***
	(0.06)	(0.06)	(0.06)	(0.06)	(0.06)	(0.06)	(0.06)
Partially repressed (dummy)	0.0123	0.307**	0.0451	0.447***	-0.269***	-0.273**	0.364***
	(0.08)	(0.12)	(0.08)	(0.09)	(0.08)	(0.11)	(0.10)
Partially repressed*(external financial dependence)	0.354***	0.308**	0.488***	0.245**	0.578***	0.579***	0.214*
	(0.10)	(0.12)	(0.08)	(0.11)	(0.08)	(0.12)	(0.11)
Partially repressed*(asset tangibility)	-0.0503	-1.027***	-0.353*	-0.351	0.252	0.506*	-0.511*
	(0.23)	(0.36)	(0.20)	(0.27)	(0.22)	(0.30)	(0.27)
Partially liberalized (dummy)	0.088	-0.208	-0.0525	0.488***	-0.14	0.0768	1.087***
	(0.10)	(0.14)	(0.08)	(0.10)	(0.09)	(0.11)	(0.11)
Partially liberalized*(external financial dependence)	0.585***	0.861***	0.894***	0.346***	1.028***	1.071***	0.751***
	(0.11)	(0.13)	(0.08)	(0.11)	(0.09)	(0.13)	(0.11)
Partially liberalized*(asset tangibility)	-0.751***	-0.00883	-0.699***	-0.465*	-0.422*	-0.990***	-2.023***
	(0.26)	(0.39)	(0.20)	(0.25)	(0.23)	(0.32)	(0.27)
Fully liberalized (dummy)	-0.0613	-0.170*	-0.155*	0.161*	-0.0309	-0.192*	0.783***
	(0.09)	(0.09)	(0.09)	(0.10)	(0.09)	(0.11)	(0.11)
Fully liberalized*(external financial dependence)	1.237***	0.927***	1.166***	0.733***	1.102***	1.492***	1.451***
	(0.09)	(0.09)	(0.07)	(0.08)	(0.07)	(0.11)	(0.10)
Fully liberalized*(asset tangibility)	-0.481**	-0.416*	-0.762***	0.0543	-0.573***	-0.664**	-1.855***
	(0.22)	(0.25)	(0.21)	(0.23)	(0.21)	(0.27)	(0.24)

Table B.1—Continued

	Directed credit	Interest rate controls	Banking supervision	Entry barriers	Privatization	International capital	Securities market
All other reforms (18 dummies)	yes	yes	yes	yes	yes	yes	yes
Constant	6.532***	6.545***	3.123***	6.726***	3.104***	6.247***	6.528***
	(0.40)	(0.40)	(0.40)	(0.40)	(0.40)	(0.41)	(0.40)
Year fixed effect	yes	yes	yes	yes	yes	yes	yes
Industry fixed effect	yes	yes	yes	yes	yes	yes	yes
Exporter fixed effect	yes	yes	yes	yes	yes	yes	yes
Observations	47,496	47,496	47,496	47,496	47,496	4,7496	4,7496
R-square	0.78	0.78	0.78	0.779	0.781	0.781	0.782
MSE	1.605	1.608	1.606	1.61	1.605	1.602	1.598

Source: Author's estimations.
Notes: GCP = gross domestic product. *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$. Standard errors in brackets. Standard errors are clustered over each exporter for each year. With separate exporter fixed effect and time fixed effect.

Table B.2—Estimates of the effects of financial reform with exporter–time fixed effect, 1986–95: Including China

	Directed credit	Interest rate controls	Banking supervision	Entry barriers	Privatization	International capital	Securities market
Partially repressed*(external financial dependence)	0.565***	0.337*	0.743***	0.484***	0.247	0.419***	-0.253
	(0.151)	(0.190)	(0.130)	(0.166)	(0.153)	(0.145)	(0.168)
Partially repressed*(asset tangibility)	0.0494	-2.179***	-0.462	-0.366	0.283	0.644	-1.804***
	(0.389)	(0.620)	(0.293)	(0.436)	(0.332)	(0.482)	(0.489)
Partially liberalized*(external financial dependence)	0.885***	0.546**	1.203***	0.562***	1.032***	1.000***	0.543***
	(0.177)	(0.226)	(0.0947)	(0.148)	(0.135)	(0.164)	(0.181)
Partially liberalized*(asset tangibility)	-0.616	1.272**	-0.315	-0.444	-0.447	-1.361***	-2.645***
	(0.500)	(0.642)	(0.415)	(0.379)	(0.393)	(0.464)	(0.521)
Fully liberalized*(external financial dependence)	1.509***	0.972***	1.146***	0.711***	1.171***	1.485***	1.142***
	(0.141)	(0.147)	(0.113)	(0.130)	(0.113)	(0.122)	(0.143)
Fully liberalized*(asset tangibility)	0.00491	-0.270	0.136	0.222	-0.858**	-0.197	-2.002***
	(0.391)	(0.439)	(0.499)	(0.392)	(0.387)	(0.422)	(0.458)
Constant	2.858***	3.297***	2.668***	2.727***	2.708***	2.954***	3.142***
	(0.147)	(0.190)	(0.106)	(0.145)	(0.112)	(0.114)	(0.157)
Industry fixed effect	yes	yes	yes	yes	yes	yes	yes
Exporter–time fixed effect	yes	yes	yes	yes	yes	yes	yes
Observations	15,698	15,698	15,698	15,698	15,698	15,698	15,698
R-square	0.793	0.793	0.792	0.791	0.793	0.794	0.794
MSE	1.567	1.568	1.569	1.575	1.568	1.564	1.562

Source: Author's estimations.
Notes: *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$. Standard errors in brackets. Standard errors are clustered over each exporter for each year.

Table B.3—Estimates of the effects of financial reform with exporter–time fixed effect, 1986–95: Excluding China

	Directed credit	Interest rate controls	Banking supervision	Entry barriers	Privatization	International capital	Securities market
Partially repressed*(external financial dependence)	0.534***	0.467**	0.762***	0.586***	0.280*	0.495***	-0.273
	(0.154)	(0.199)	(0.132)	(0.171)	(0.154)	(0.147)	(0.174)
Partially repressed*(asset tangibility)	0.257	-2.722***	-0.543*	-0.850**	0.109	0.456	-1.793***
	(0.390)	(0.630)	(0.294)	(0.431)	(0.334)	(0.490)	(0.494)
Partially liberalized*(external financial dependence)	0.885***	0.676***	1.222***	0.665***	1.066***	1.090***	0.567***
	(0.177)	(0.233)	(0.0961)	(0.154)	(0.137)	(0.165)	(0.185)
Partially liberalized*(asset tangibility)	-0.616	0.730	-0.422	-0.928**	-0.622	-1.651***	-2.816***
	(0.500)	(0.651)	(0.416)	(0.373)	(0.394)	(0.471)	(0.526)
Fully liberalized*(external financial dependence)	1.509***	1.103***	1.165***	0.814***	1.204***	1.575***	1.166***
	(0.141)	(0.159)	(0.114)	(0.137)	(0.115)	(0.123)	(0.148)
Fully liberalized*(asset tangibility)	0.00467	-0.813*	0.0288	-0.262	-1.033***	-0.488	-2.174***
	(0.391)	(0.453)	(0.500)	(0.387)	(0.388)	(0.430)	(0.464)
Constant	3.936***	4.849***	0.590***	4.534***	4.462***	4.021***	5.624***
	(0.167)	(0.239)	(0.117)	(0.174)	(0.0899)	(0.102)	(0.143)
Industry fixed effect	yes	yes	yes	yes	yes	yes	yes
Exporter–time fixed effect	yes	yes	yes	yes	yes	yes	yes
Observations	15,429	15,429	15,429	15,429	15,429	15,429	15,429
R-square	0.791	0.791	0.790	0.789	0.791	0.792	0.793
MSE	1.576	1.575	1.578	1.583	1.576	1.571	1.569

Source: Author's estimations.
Notes: *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$. Standard errors in brackets. Standard errors are clustered over each exporter for each year.

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