MARKET REFORMS AND EFFICIENCY GAINS IN CHILE*

REFORMAS DE MERCADO Y GANANCIAS DE EFICIENCIA EN CHILE

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Abstract

Starting in the mid 1970s, Chile implemented comprehensive structural market reforms. Using manufacturing plant-level data on Chilean firms for years 1980 to 2001, we estimate the role of reforms on efficiency. We analyze aggregate productivity constructed from micro data to find that in the aftermath of the reforms, efficiency gains were explained by within-plant improvements and by the net entry of new units. We also find that plants producing traded goods and plants facing liquidity constraints experienced the largest efficiency gains. Trade openness and a superior access to external finance seem to have partially accounted for the improvement in manufacturing performance.

Key words: Plant dynamics, Productivity, Manufacturing, Chile.

Resumen

A partir de mediados de la década de los 70, Chile implementó un número relevante de reformas estructurales a sus mercados. En este trabajo estimamos el efecto de estas reformas sobre la eficiencia agregada, utilizando datos de plantas manufactureras chilenas para el período entre 1980 y 2001. Descomponemos la productividad agregada construida a partir de datos microeconómicos, encontrando que, luego de las reformas, las ganancias de eficiencia se explican tanto por mejoras al interior de las empresas como por la entrada neta de nuevos establecimientos. También encontramos que las mayores ganancias fueron obtenidas por las plantas que producen bienes transables y por aquellas

* We thank Instituto Nacional de Estadísticas for providing the manufacturing plant-level data used in this paper. We also thank the research assistance provided by Rafael Labarca, and the helpful comments of Ronald Fischer and two anonymous referees. Useful suggestions have also been provided by participants in a number of seminars and conferences. We acknowledge financial support from the IADB and Fondecyt (1050499 and 1070805).

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restringidas en su liquidez. Así, nuestros resultados sugieren que la apertura comercial y el mejor acceso al financiamiento externo explican en parte el mejor desempeño manufacturero en Chile.

Palabras clave: *Dinámica de plantas, Productividad, Manufacturas, Chile.*

JEL Classification: *L16, L60, O47, O12.*

1. Introduction

Starting in the mid 1970s, Chile implemented deep and comprehensive structural reforms. The main goal was to increase the role of markets in the economy. The results speak for themselves. Chile's outstanding macroeconomic performance during the past two decades has been portrayed as an example of successful market-oriented policies. Although these decades have not been free of turbulence, Chile has developed into a stable emerging economy that has outperformed the rest of Latin America. And though favorable external conditions contributed to achieve this rapid growth, its main source was a remarkable increase in total factor productivity (TFP). In fact, since 1980, almost 90% of total growth is explained by efficiency gains.[1]

The response of the economy to reforms at the macroeconomic level reflects substantial changes in the industrial organization of domestic markets, as well as in the process of adaptation of individual firms to a more dynamic environment. Plant dynamics, as this paper shows, accounts for a substantial part of aggregate efficiency gains in Chile. Thus to better understand the link between market reforms and growth, we must first understand the link between these reforms and plant dynamics. Surprisingly, in spite of the broad agreement there is on the importance of market reforms in explaining high and sustained growth in Chile, limited empirical evidence has been provided to quantify this connection. Using plant-level data on Chilean manufacturing firms for the years 1980 to 2001 period, we provide suggestive evidence. To do so, we characterize plant-level TFP to study the microeconomic sources of aggregate efficiency.

The Chilean experience is particularly interesting for several reasons: First, the reforms were deep and affected all key markets. Among other reforms, public firms were privatized, most trade impediments were lifted, labor markets were flexibilized, the financial system was liberalized, and individual accounts for social security were created. Second, the available micro data encompass a long period of time, including part of the enactment and implementation of the reforms and over a decade of their aftermath. This allows us to capture the full effects of the reforms. Finally, although most reforms were implemented at once, the deep recession of 1982 and 1983 led authorities to reverse some policies. Other papers analyzing the Chilean experience have used data between

[1] See Bergoeing *et al*. (2002a). Kehoe and Prescott (2002) provide similar findings for a sample of developed economies. Cole *et al*. (2005) show that most differences between the performance of Latin American countries and the Western economies takes root in differences in the behavior of TFP.

1980 and 1986 (Pavcnik (2002) and others), and have incorrectly assumed that the economy was far more flexible in the mid 1980s than in the early 1980s. This is not the case as, for instance, the mean tariff reached 35% by mid 1985, whereas in 1980 it was only 10%.

Our results suggest a quantitatively relevant connection between market reforms and efficiency gains in Chile. By decomposing productivity dynamics into production reallocation and within plant efficiency changes, we find that once reforms were fully implemented, aggregate efficiency gains were explained in equal proportions by within plant changes and the net entry of more productive economic units. The reallocation among incumbent firms did not contribute significantly to changes in efficiency, however.

We also analyze the behavior of within-plant efficiency gains. We find that although newly created firms display lower productivity than incumbents at the beginning, entering survivors quickly improve their productivity. After one period only, the productivity of a new plant is statistically equal to that of an incumbent. Meanwhile, exiting plants experience a downward trajectory of productivity prior to exit. Thus, inefficient plants are replaced by firms that are more efficient and that experience rapid improvements in productivity. That is, plant turnover leads to aggregate efficiency gains.

How does idiosyncratic efficiency respond to specific market reforms? We examine the effects of trade liberalization and financial market reforms on plant dynamics. To study the role of trade, we classify plants according to the trade orientation of the sector they belong to. We show that firms producing tradable goods are many times more productive than firms producing non-tradable goods. This productivity advantage increased over time, indicating not only the existence of a lag between reforms and their effect on TFP, but also that the bilateral agreements that were signed after 1990 are associated with additional productivity gains. We also analyze the reaction of plant-level TFP to changes in the effective tariff rate. We show that plants producing in exporting, import-competing and other tradable sectors grow faster when effective tariffs fall. Overall our results are consistent with the hypothesis that specialization and trade, both in input and final product markets, generate efficiency gains. These gains could potentially be attributed to a variety of reasons, such as a reduction in production costs if some inputs are imported, and to the incentives to trim domestic firms' fat as foreign competition increases.

After the early 1980s crisis, and after the implementation of tax and social security reforms that strongly promoted savings, Chile experienced an investment boom, with financial market deepening and foreign finance expansion. To explore the role of the development of financial markets on plant efficiency we use the identification strategy of Rajan and Zingales (1998), and find that financial market deepening relatively favored productivity gains within plants producing in sectors that are more dependent on external financing. These results are consistent with the hypothesis that firms that were credit constrained experienced the largest gains from financial market development.

In short, the exposure to foreign markets and the higher access to external finance have fostered aggregate efficiency gains in Chile. These are the result of the adoption of better technologies and production processes, both by new firms and incumbents.

The policy implication derived from this paper is clear: Exposing firms to the best practices is necessary to generate conditions that promote aggregate growth. On the opposite side, rigidities that block plant dynamics, particularly through altering the natural process of birth and death of plants, impede growth and limit development.

A number of papers have also analyzed the link between growth, TFP and policies in Chile[2]. Using aggregate data and numerical simulations, Bergoeing *et al.* (2002b) suggest that banking and bankruptcy law reforms explain Chile's steep recovery path after the severe crises of the early 1980s through their effect on TFP. Caballero *et al.* (2004) measure labor market inflexibilities by the speed at which plants close the gap between labor productivity and the marginal cost of hiring workers. Although Chile exhibits a relatively high degree of micro flexibility, the paper suggests that its decline is large enough to explain the decline in TFP-growth observed since 1997.

Perhaps because of the early timing of the trade liberalization and because the post-crisis recovery was driven by export growth, most papers using micro level data have studied the relationship between Chile's trade reforms and TFP. Liu (1991) analyzes whether the competitive pressure from trade reforms forced less efficient plants to fail more frequently. Tybout (1992) deals with the heterogeneous effects on technical efficiency of exposure to increased foreign competition. Alvarez and Fuentes (2003) examine the changes in the composition of manufacturing production and the implied productivity changes as a response to the liberalization. Bas and Ledezma (2007) estimate trade barriers in a multilateral context to disentangle the effect of export –and import– oriented policies on plant productivity. Although these papers use different statistical strategies, they all suggest that trade liberalization played a relevant role in explaining TFP. On a related matter, Fernandes and Paunov (2008) study the role of FDI on plant productivity growth suggesting that reductions in barriers restricting foreign investment may help accelerate growth. Similarly, Alvarez and Crespi (2009) show that multinationals may play a role in speeding up across-plant convergence in TFP[3].

The paper is organized as follows. The next section describes the main structural reforms implemented in Chile since the mid 1970s and its macroeconomic performance afterwards. In Section 3 we present the manufacturing data used and we characterize aggregate and plant-level TFP. In Section 4 we study and quantify the role of market oriented policies in the process of efficiency enhancing plant-dynamics. The final section concludes.

2. Market reforms in Chile: an overview

Today few question the significance of the structural reforms initiated thirty years ago in shaping the economic transformation of Chile over the past few

[2] Alvarez and Fuentes (2003) describe the early literature.

[3] A related literature that we do not review here studies different aspects of the relative performance of exporters and non-exporters. See, for instance, Alvarez (2007) and Alvarez and López (2005 and 2008).

decades[4]. The scenario was very different in the late 1960s and early 1970s, however. Trade restrictions had practically isolated the Chilean economy from the rest of the world. The structure of relative prices was drastically distorted in favor of industrial goods at the expense of agricultural, mining and other tradable activities. Differential import duties exempted capital goods and levied high taxes on final goods, creating a largely inefficient capital –intensive industrial sector. In particular, import tariffs ranged from 0 percent for capital goods to 750 percent for luxury goods. There was also a requirement of a 90-day non-interest bearing deposit of 10,000 percent of the CIF value of imported goods and all import operations required administrative approval. In addition, a system of multiple exchange rates prevailed reaching at the collapse of the economy in 1973 a 52 to 1 ratio.

The few imports that resulted were concentrated on intermediate goods, followed by capital goods and some essential consumer goods. Exports were mostly concentrated on copper, making the trade balance highly dependent on the evolution of copper prices. Moreover, several foreign mining companies, banks and enterprises had been nationalized.

In short, the military government that took power in September 1973 inherited an economy closed to international trade, dominated by the public sector, and with severe macroeconomic imbalances in the form of accelerating inflation and a deteriorating balance of payments. Relative prices were starkly distorted and the production and distribution of goods was mainly determined by bureaucratic rules. The labor market was dominated by a few unions, which were fighting for political rather than for workers' objectives. The country had practically no foreign exchange reserves and the fiscal budget reached a deficit of 25% of GDP.

Since the very beginning, the military government implemented far-ranging pro-market reforms. The initial set of trade reforms was intended to simplify the structure of the economy. Consistently, exchange markets were unified and all restrictions to trade other than tariffs were removed immediately, while tariffs were reduced from an average of 94% in 1973 to a uniform rate of 10% by 1979. Price ceilings and public purchasing mechanisms were also eliminated, and the state withdrew from most areas of the economy, including labor relations, international economic relations and social services.

In short, the initial reforms contemplated nine main themes: (1) A stabilization program to reduce an increasing inflation; (2) the liberalization of markets in an effort to get the price system back in operation; (3) public sector reforms to reach macroeconomic stability and to improve its efficiency and that of the whole economy; (4) trade reforms to provide incentives to export oriented and import competing activities; (5) a social security reform to transit from a pay-as-you go pension system to one based on individual capitalization; (6) a financial sector reform to improve the efficiency of financial intermediation; (7) a labor market reform to facilitate the industrial restructuring and the drastic reallocation of labor that had to take place from the highly protected import competing

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4 The Chilean economic transformation has been extensively documented by Cox-Edwards and Edwards (1991), De la Cuadra and Hachette (1991), Corbo (1993), and Bosworth *et al.* (1994).

sectors towards the export oriented activities; (8) a comprehensive privatization program; and (9) social sector reforms to improve incentives in the production and provision of social services.

Early on, the economy recovered at high speed: During the 1976-80 period, GDP grew at an average rate of 7% and the availability of foreign goods expanded markedly. However, and although reforms continued its advance in several fronts, two major problems remained unsolved: The unemployment rate did not decline in a significant manner and inflation remained stubbornly high. Among the instruments used to control inflation, the fixing of the nominal exchange rate in June 1979 proved to have a devastating effect. The highly indexed nature of the Chilean economy, in combination with the fixed exchange rate, induced an increasing real exchange rate overvaluation, fostering imports and discouraging exports and leading to large current account deficits. In 1981, the external deficit reached 14.5% of GDP. Large amounts of foreign loans entered the country to finance the trade imbalance and, as a consequence, foreign debt skyrocketed between 1977 and 1981. Two additional elements also helped generate the observed rise in the level of indebtedness: The resistance of the real interest rate to converge to world levels and the deregulation of the financial market in 1981. The former induced a continuous flow of short-term lending; the lack of adequate supervision of the quality of the portfolio of banks due to the latter, led to a generalized miscalculation of risk levels and imprudent domestic lending (Barandiarán and Hernández, 1999).

With such a large trade imbalance, confidence on the Chilean economy faltered and foreign lending ceased. In June 1982 the authorities were forced to devalue the peso by 19%, but "it was too little and too late" (Cox-Edwards and Edwards, 1991). The economy fell in a deep recession as GDP dropped by 13.6% in 1982 and a further 2.8% in 1983. Unemployment, at already high levels, swelled to 34% of the labor force (including emergency employment programs), and the government deficit increased to almost 9% of GDP when the Central Bank had to rescue the financial sector from bankruptcy. Foreign debt reached 130% of GDP in 1983.

This recession led authorities to partially reverse the openness policies. In particular, the mean tariff was raised, reaching a level of 35% in 1985. Since then, however, the reduction in tariffs continued.

Starting in 1985, the government went through a second round of privatizations that included public utility firms and financial companies that had been taken over in the 1982 financial collapse. In 1986 a new banking law was implemented. As a result, the financial system was rebuilt and a greater supervisory role for the Central Bank was established. Innovative debt conversion schemes were introduced to reduce foreign debt by approximately 50%.

In 1990, and after 17 years of a military regime, democratic elections were held and the candidate of a center-left coalition was elected. Immediately after the new president was in power, the commercial links with the rest of the world were strengthened and a number of multilateral agreements were initiated. As of today, Chile maintains trade agreements with most economies in the world, covering more than 95% of its exports. Similarly, capital inflows increased as foreign investment decisions were determined by market conditions. The 1990s mark the consolidation of a market economy drastically transformed during the previous 15 years.

Since the beginning, the democratic governments maintained a strong fiscal stance and the Central Bank of Chile –independent since 1989– gradually reduced inflation to its lowest level in half a century. Public spending on social programs increased sharply. Structural reforms proceeded at a much slower pace, however.

Summing up, only during the late 1980s and early 1990s the Chilean economy fully reaped the benefits from the changes in economic incentives and productive structure that came with market reforms. By the end of the 1990s, Chile had unquestionably been the Latin American country with the most consistent record over the past two decades. The sound and stable behavior of most macroeconomic indicators and the sharp improvement in social indices place Chile as the most successful recent experience in the region. In fact, the 1990s were much more stable than the 1980s in spite of the Tequila and the Asian crises. The volatility of detrended GDP was 5.8% during the 1970s, 5% during the 1980s, and only 2.1% during the 1990s.

3. Plant dynamics and aggregate TPF

Two sources of productivity gains drive aggregate efficiency over time: The exposure of economic units to better production methods (within-plant efficiency gains) and the Schumpeterian creative destruction process through which efficient firms thrive while inefficient ones disappear (reallocation driven efficiency gains). The former results from the adoption of better technologies and more efficient production processes by incumbents; the latter occurs from the reshuffling of resources from less to more productive firms, and from the entry process of new and more efficient firms that replace old and less efficient ones. A number of papers report evidence for developed and developing economies on the importance of plant dynamics in accounting for aggregate efficiency gains[5].

This virtuous process of reallocation, technology adoption and efficiency gains should be directly linked to market reforms. Two recently available regularities support this prior: First, the research based on plant-level data shows that productivity is highly heterogeneous across units, even within narrowly defined sectors at any given period of time. This heterogeneity is a necessary condition for the reallocation of inputs and output to be a relevant source of productivity gains and aggregate growth. Second, the data show that vintage is an important factor in explaining productivity gaps. Hence, the entry of firms with new technologies and production processes is also an important source of TFP gains. Therefore, market reforms that promote this entry-exit process and facilitate a better allocation of resources spur TFP growth by inducing the adoption of superior production techniques and by reshuffling resources towards their most efficient use.

In the remainder of this section, we look into the microeconomic components of the aggregate dynamics of TFP. We first disentangle the sources of aggregate TFP gains into within-plant productivity, reallocation and net entry effects.

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[5] See Bartelsman and Doms (2000) for a review of the literature.

We then provide a more detailed view of the relative productivity evolution of entering and exiting plants in order to better understand the role of net entry effects on aggregate TFP growth. In the following section we provide evidence that suggests that, at least for Chile, market reforms are linked to the underlying microeconomic sources of the economy wide TFP gains.

(a) Characterizing aggregate productivity from plant-level data

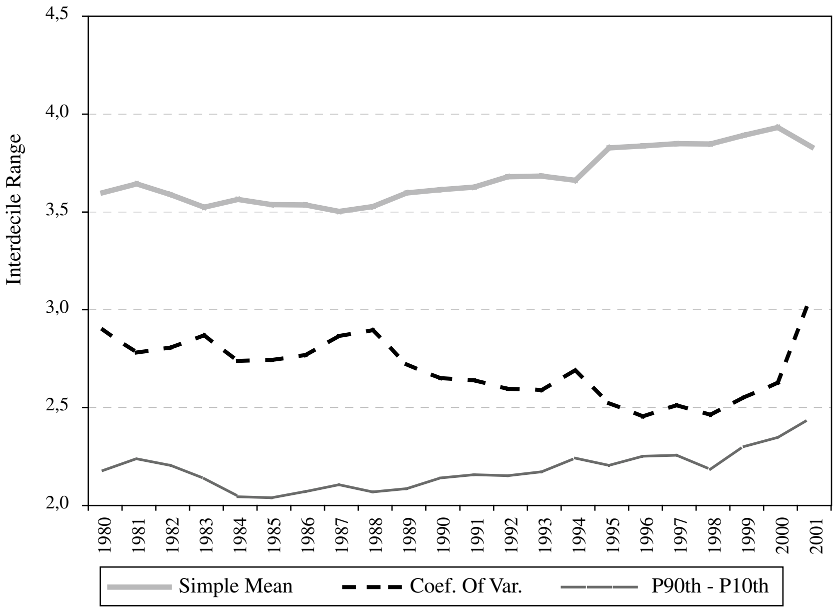
The data in this study come from the 1980-2001 Encuesta Nacional Industrial Anual (ENIA), an annual survey of manufacturing conducted by the Chilean statistics agency, the *Instituto Nacional de Estadísticas* (INE). The ENIA covers all manufacturing plants that employ at least ten individuals. Thus, it includes all newly created and continuing plants with ten or more employees, and it excludes plants that ceased activities or reduced their hiring below the survey's threshold[6]. The ENIA collects detailed information on plant characteristics such as manufacturing sub-sector at the 4-digit ISIC level, sales, employment, investment, intermediate inputs and location.

Using this data set, Bergoeing *et al.* (2006) have estimated production functions and plant-level TFP using the strategy developed by Olley and Pakes (1996) and further extended by Levinsohn and Petrin (2003). They provide estimates of the production functions for 26 3-digit ISIC sub-sectors that account for 92% of total real gross revenue in the ENIA. The measure of plant-level TFP we use in this paper is the residual from those estimated production functions.

Figure 1 plots the evolution of the simple average of plant-level log TFP and some measures of its dispersion. Average TFP displays large changes across the first and second half of our sample. Specifically, in 1987, aggregate TFP was about 9% lower than in 1980. It then grew steadily until year 2000. TFP dispersion, measured using the difference between the 90^{th} and 10^{th} percentiles follows a similar pattern. When measured using the coefficient of variation, the dynamic pattern is somewhat different. However in any case, the figure shows that there is wide dispersion in TFP across plants –the coefficient of variation moves between 0.34 and 0.45 throughout the period whereas the minimum interdecile range equals 2.0–, so most of the variation is associated with dispersion of TFP at the plant level in any given year. Calculations for sectors at the three-digit level show a consistent pattern. These large differences in productivity are a necessary condition for reallocation to be a relevant source of efficiency gains. Additionally, the figure shows a substantial increase in the dispersion of TFP in spite of the reduction in aggregate volatility in the late 1980s relative to the

6 The treatment of entry and exit is somewhat complicated by the fact that plants falling below the minimum employment boundary do not appear in the survey. Thus a plant interviewed in any given year, but that fails to enter the sample in the following year might not represent an exit. Similarly, a plant appearing for the first time in any given year does not necessarily correspond to an entry, as it might represent a growing plant that surpasses the ten people boundary. To reduce the extent of spurious identification of plant entry and exit, we artificially raised the sample threshold to 15 employees, following the strategy in Micco (1995).

FIGURE 1
MEAN TPF AND ITS DISPERSION



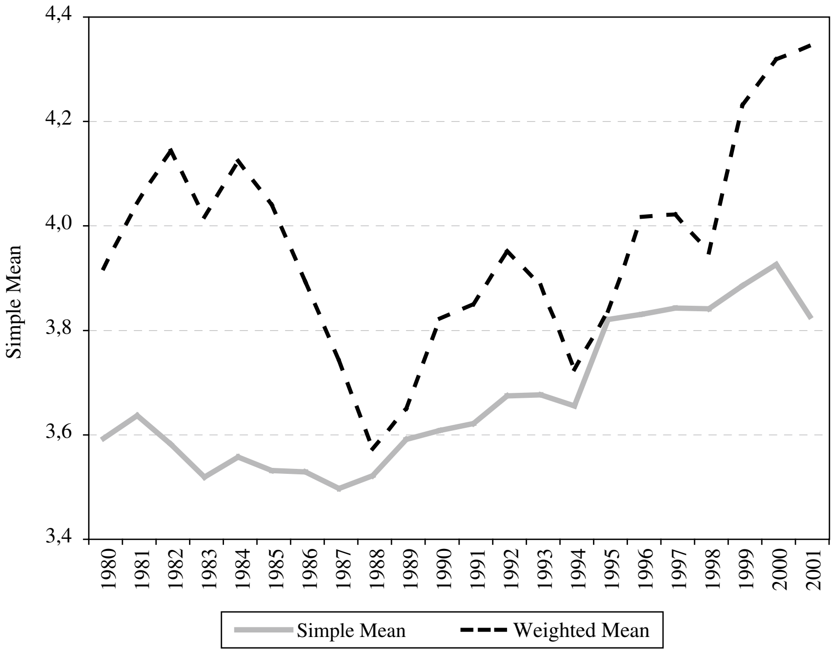
earlier years of our sample period[7]. In 1980, the coefficient of variation was equal to 0.43. By 2001, it peaked at a level of 0.46 after reaching its lowest point at 0.34 in 1996. This higher relative heterogeneity may reflect the higher degree of market flexibility due to the reforms implemented a decade earlier.

Figure 2 plots the evolution of the simple and weighted average log TFP, using the shares of each plant's value-added out of total value-added in a given year as weights. This weighted measure has been extensively used in the literature in order to capture the aggregate productivity gains due to the allocation of activity (Foster *et al.*, 1998). Olley and Pakes (1996) decompose this weighted average into the simple average and a covariance term between market shares and TFP. Whenever the most efficient firms have the largest market shares, the allocation of inputs and output is efficiency enhancing. If so, the weighted average reaches a higher level than the simple average.[8] The figure shows that in Chile the weighted measure is always above the simple average, thus that production is disproportionately located at the most efficient plants.

7 Comin and Mulani (2006) show that aggregate and firm level volatilities have also followed diverging paths over the past two decades in Canada and in the United States. In particular, while the former has decreased, the latter has increased.

8 The covariance term is the distance between the weighted and simple averages measures depicted in Figure 2.

FIGURE 2
TPF EVOLUTION: SIMPLE AND WEIGHTED MEANS



Nevertheless, it is interesting to note that aggregate TFP is mostly accounted for by the simple average, and not by the allocation term[9]. The relative contribution of the covariance term varies over the period and is larger over the 1980s when it reached an average relative importance of 9%. Starting in 1988, average productivity drives the increase in productivity observed in the Chilean manufacturing sector. After a large number of distortionary policies that placed impediments on reallocation were removed, the allocation of resources among incumbents lost relative importance. The adoption of better techniques seems to largely account for the improved industry performance.

(b) The sources of aggregate TFP gains

We now disentangle aggregate productivity dynamics into within-plant efficiency changes and the reallocation gains arising from the expansion and contraction of continuing plants as well as from the entry and exit of economic units. We follow Foster *et al.* (1998) in decomposing productivity growth into four elements: (i) A within-plant effect, given by incumbents' productivity growth weighted by initial output shares; (ii) a reallocation effect, that captures

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9 Foster *et al.* (1998) find similar results for the US. In contrast, Eslava *et al.* (2004) find that the contribution of the covariance term accounts for almost all aggregate productivity in Colombia.

the gains in aggregate productivity coming from the expanding market share of high productivity plants relative to the initial aggregate productivity level; (iii) an entry effect which is the sum of the differences between each entering plant's productivity and initial aggregate productivity, weighted by its market share; and (iv) an exit effect given by the sum of the differences between each exiting plant's productivity and initial aggregate productivity, weighted by its market share. The decomposition is given by:

$$\Delta P_t = P_t - P_{t-k} = \sum_{i \in C} \theta_{it-k} \Delta p_{it} + \sum_{i \in C} \Delta\theta_{it}(p_{it} - P_{t-k}) + \sum_{i \in N} \theta_{it}(p_{it} - P_{t-k}) - \sum_{i \in X} \theta_{it-k}(p_{it-k} - P_{t-k})$$

where Δ refers to changes over the k-year interval; P_t is the log aggregate productivity level in year t; p_{it} is plant's i log efficiency in year t; θ_{it} is its output share in total output at time t, and C, N, and X are the sets of continuing, entering, and exiting plants, respectively. Thus, incumbents contribute to aggregate log productivity growth whenever they become more efficient, and whenever the more productive plants increase their market share. New plants contribute positively to productivity growth if they have higher productivity than the initial industry average. Exiting plants contribute if they have lower productivity than the initial industry average. The last three terms of the decomposition capture the effects of heterogeneity. If all plants were identical, then the within effect would constitute the only source of aggregate gains.

The results of this decomposition are presented in Panel A of Table 1. The first column of Table 1 displays our results for the full sample period. Aggregate productivity gains are driven completely by the entry of new, more productive firms. The contribution of within-incumbents efficiency gains and of the reallocation of value added among continuing plants is small when such a long period of time is considered.

In columns (2) to (5) we decompose aggregate TFP growth in four different five year periods. Over these shorter periods within plant productivity gains are more important than over longer periods. This fact, combined with the results in the first column, imply that entrant firms experience faster productivity growth than incumbents[10]. In column (7) we present the decomposition when considering the 1986-1998 period that most analysts consider as the "economic miracle" period in the recent Chilean economic history. This appreciation seems to be confirmed by the numbers: productivity gains by entering plants and reallocation of production within incumbents both explain more of the productivity gain in the manufacturing sector than productivity associated to exiting firms does. Finally, column (8) repeats the exercise focusing on the aggregate productivity

[10] Recall that, due to our partition of the time dimension, a plant that is an entrant in column (2) is either an incumbent or an exiting plant in column(3). Thus faster incumbents productivity gains in a 5 year period than in the overall sample means that previous entrants (younger incumbents) experience faster productivity growth.

TABLE 1
DECOMPOSITION OF AGGREGATE TIP GAINS

	Full Period 1980-2001	(2) 1981-1985	(3) 1986-1990	(4) 1991-1995	(5) 1996-2000	(6) 1986-1998	(7) 1988-2001
				Panel A			
TEP Gain	0.418	−0.055	−0.086	0.258	0.255	0.566	0.786
Within	−0.014	−0.205	−0.111	0.092	0.159	0.164	0.457
Reallocation	0.432	0.150	0.025	0.167	0.096	0.402	0.329
Among Incumbents	−0.097	0.170	0.020	0.094	0.108	0.135	0.078
Entry	0.582	−0.037	0.013	0.090	0.248	0.384	0.665
Exit	0.053	−0.017	0.008	0.017	0.261	0.117	0.414
Net Entry	0.529	−0.020	0.005	0.073	−0.013	0.267	0.251
Share of TFP gain (%)	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%
Within	−3.29%	372.73%	128.92%	35.50%	62.43%	28.99%	58.14%
Reallocation	103.29%	−272.73%	−28.92%	64.50%	37.57%	71.01%	41.86%
Among Incumbents	−23.25%	−309.09%	−23.11%	36.24%	42.56%	23.86%	9.92%
Entry	139.23%	67.27%	−15.27%	34.84%	97.49%	67.88%	84.61%
Exit	12.69%	30.91%	−9.47%	6.58%	102.47%	20.74%	52.67%
Net Entry	126.54%	36.36%	−5.81%	28.26%	−4.99%	47.15%	31.93%
				Panel B			
Number of Plants, by type							
Enter	3.220	758	1.046	1.155	1.239	2.566	2.652
Exit	3.885	1.255	721	875	2.015	1.947	2.607
Incumbents	2.819	6.964	6.798	7.680	6.523	4.302	3.769
Share of Value Added (%), by type							
Starting year							
Incumbents	46.24%	92.47%	94.87%	92.99%	60.09%	70.93%	40.15%
Exit	53.76%	7.53%	513%	7.01%	39.91%	29.07%	59.85%
Ending	Year						
Incumbents	40.53%	92.29%	88.43%	89.05%	78.86%	68.21%	53.03%
Enter	59.47%	7.71%	11.57%	10.95%	21.14%	31.79%	46.97%

growth between 1988 and 2001[11]. As already shown in Figure 2, the time-series pattern of aggregate TFP suggests a break in the evolution around 1988. The gains in aggregate efficiency in the later period are twice as large as the gains obtained over the complete sample period. Moreover, like in the full period, the net entry of new firms accounts for a large fraction of aggregate gains. However, this time within-plant efficiency improvements also contribute significantly to aggregate TFP growth.

One possible concern with the previous exercise is that, over long periods, the results may be driven by natural plant dynamics (that is, the vegetative rates of plants been born, growing and dying). In other words, the relative relevance of the net entry effect might not be surprising, given the length of the time period considered[12]. Still, Panel B of Table 1 shows that, for any of the periods considered, incumbent plants represent a large share of both total plants and total value added. Thus, it is not the case that productivity gains in incumbents are not important because they are a small share of the sample but because those gains in productivity are of much smaller magnitude than those taking place in entering firms or resulting from less productive firms exiting the manufacturing sector.

Overall, the results suggest that when reforms were fully implemented, the average plant exhibited important efficiency improvements. Reallocation played a key role due to the net entry of firms that had higher than average productivity more than to changes in the allocation of inputs and output across incumbent plants.

(c) The behavior of plant entry and exit

The aggregate TFP growth accounting grants a key role to the net entry of plants in long periods of time. In this section we further analyze the relative efficiency of newly created plants and shutdowns.

There exists a vast theoretical literature on firm heterogeneity pioneered by Jovanovic (1982) and further extended by Hopenhayn (1992), Ericson and Pakes (1995), Bergoeing *et al.* (2004), and Bergoeing *et al.* (2010). These models are characterized by heterogeneous production units, vintage capital, common and idiosyncratic shocks, and an ongoing process of plant entry and exit. Plants exit if aggregate economic prospects loom negative. Plants may also exit if their current technology becomes obsolete. Thus plants with relatively low level of technology are scrapped. New units enter embodying inputs and production processes that reflect the leading edge technology. However, new firms are

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11 Our estimates correct for the fact that plants may leave and re-enter the sample without having actually exited the market. For instance, a plant may leave the sample prior to 1988 and reenter in 1989 or later. This plant is an incumbent according to our definition of entry and exit, but would be incorrectly classified as an entry if only data for years 1988 and 2001 were to be considered. There are 93 plants in our data set that leave and reenter the sample around 1988. It is worth emphasizing, though, that the results in Table 1 are almost unchanged if these corrections are not made.

12 After a 20 year time span, only 35% of plants are expected to survive if the unconditional probability of exit in any time period is 5%. See Bergoeing *et al.* (2006).

uncertain with respect to their own idiosyncratic efficiency, and thus may enter and quickly leave the market after this uncertainty is resolved.

Table 2 reports regressions of plant-level log TFP accounting for entry and exit effects. The entry dummy is equal to one in period *t* if the plant produced in year *t* but not in any previous period. Similarly, the exit dummy is equal to one in period *t* if the plant produced in that year, but not in any period ahead. The first column shows that the typical entering plant is less productive than incumbents, contrary to the predictions of vintage capital models[13]. Still, newly created firms have an advantage over shutdowns. Depending upon the specification, incumbents have a 3.2% to 3.9% productivity advantage over entering plants. This difference rises to about 7% when continuing plants are compared to exiting plants.

TABLE 2
PLANT LEVEL TFP, EFFECTS OF ENTRY AND EXIT

	(1)	(2)	(3)	(4)
Entry	–0.039 (0.008)	–0.032 (0.008)	–0.043 (0.008)	–0.037 (0.008)
One period lag of Entry			–0.011 (0.008)	–0.008 (0.008)
Two periods lag of Entry			–0.007 (0.009)	–0.008 (0.009)
Exit	–0.070 (0.008)	–0.073 (0.008)	–0.073 (0.008)	–0.076 (0.008)
One period lead of Exit			–0.051 (0.008)	–0.053 (0.008)
Two periods lead of Exit			–0.029 (0.008)	–0.033 (0.008)
Sector dummies	Yes	Yes	Yes	Yes
Year dummies	Yes	Yes	Yes	Yes
Sector*Year dummies	No	Yes	No	Yes
N	84907	84907	84036	84036
R^2	0.89	0.90	0.89	0.90

The third and fourth columns of the table explore the dynamics of productivity post entry and prior to exit. Does the productivity of firms that enter increase over time? Are there learning effects? Similarly, does the efficiency of exiting plants deteriorate before they actually exit? To explore the evolution of exiting firms' productivity we added one and two period leads of the exit dummy to our specification. Similarly, to account for learning effects we added one and two period lags of the entry dummy. The results reported on columns (3) and (4) suggest that exiting plants experience a downward trajectory of productivity prior to exit. Several studies have reported similar results for other countries[14]. The

13 Bartelsman and Doms (2000) report similar evidence for the OECD.
14 See Tybout (2000) for a review.

results also suggest that entering survivors quickly improve their productivity. After one period only, the productivity of a new plant is statistically equal to that of an incumbent. These patterns imply that inefficient plants are replaced by firms that are more efficient, and that experience rapid improvements in productivity. Plant turnover thus leads to aggregate efficiency gains.

4. Market reforms and productivity gains: the Chilean evidence

In this section we analyze the effects of two key reforms on the dynamics of plant-level TFP: Trade liberalization and financial market deepening. The evidence we present is suggestive of the consequences these reforms may have had on plant performance. This evidence, though, should not be taken as conclusive, due to two limitations of our analysis. First of all, a large number of reforms were implemented at the same time. Secondly, the reforms implemented in Chile were neutral in the sense that they gave the same incentives to all firms (*e.g.*, one single tariff rate taxes the imports of all goods). Thus it is hard to identify the effects of any single reform on the economy.

With these caveats in mind, in this section we present evidence that suggests that the exposure to foreign markets and a higher access to external finance have fostered efficiency gains in Chile. These TFP increases have resulted mostly from the adoption of better technologies and production processes, both by new firms and incumbents.

(a) The effects of trade reforms on plant-level efficiency

Trade liberalization enhances plant and aggregate productivity through different channels. First of all, it exposes domestic firms to foreign competition, reducing their market power and forcing them to improve their efficiency in order to ensure survival. Secondly, if there are domestic and foreign market entry costs, trade liberalization induces the least efficient plants to shutdown, whereas only the most productive plants are able to successfully export[15]. Trade also facilitates the access to foreign technology and reduces the cost of foreign intermediate and capital goods.

To explore the effects of trade policy on plant-level productivity, we classify plants according to the trade orientation of the sector they belong to at the 3-digit ISIC level[16]. Compared to firms in non-traded goods sectors, firms in export-oriented and import-competing sectors are exposed to the competition

15 See Eaton and Kortum (2002), Melitz (2003), and Bernard *et al.* (2003) for recent models of trade with heterogeneous firms.

16 We have chosen to classify plants' trade orientation based on sector level observations rather than on plant level export-import status to avoid classifying firms on the basis of a variable that is endogenous to productivity at the plant level. See Melitz (2003).

of foreign firms, and thus must be more efficient in order to survive. All plants, though, are benefited by the reduced cost of foreign inputs.

We use the sector classification of Hernando (2001). According to this strategy, sectors can be classified depending upon the export intensity of sales and the volume of imported competing goods. A sector is non-traded if (1) the export share in total sales is lower than 10% and import penetration does not exceed 6%, or (2) import penetration is lower than 10% and the export share does not exceed 6%. A sector is export-oriented if the export intensity of sales is larger than 10%. A sector is import competing if import penetration exceeds 20%. Using data for 1986-1996, Hernando (2001) finds that export oriented sectors are those related to natural resources, such as the manufacturing of paper, chemicals, food processing, and beverages. The sectors classified as import-competing are those that are labor intensive, such as textiles and leather industries. The manufacture of machinery is also classified as import competing. Under this classification, some sectors are both import-competing and export-oriented, so we created another category called "other traded". Thus using this classification, we generated a set of dummy variables indicating the trade orientation status of each plant's sector.

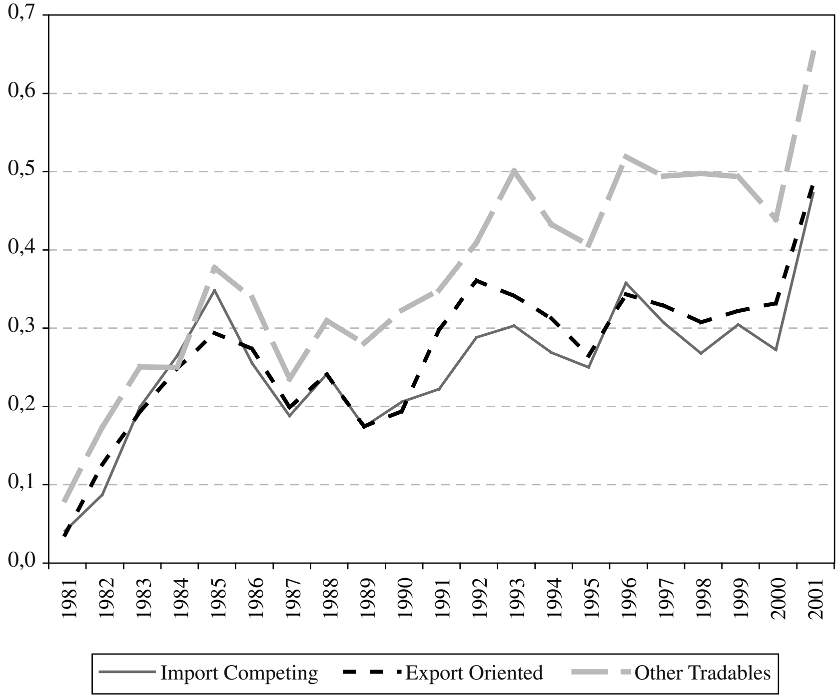
Ideally, to estimate the effects of trade liberalization on plants, one would use a measure of trade protection that varies across firms. However, Chile had reduced its tariffs to 10% for all goods in 1979 –prior to the start of our sample period–, and then changed the level of protection in a uniform manner. Thus, in the Chilean case it is not possible to clearly identify the effects of trade reforms, and to disentangle them from the effects of other reforms enacted at the same time. Other countries, such as Brazil –studied by Schor (2004)– maintained differential tariffs that depended upon sectors and upon the stage of production of goods (final or intermediate).

We have taken two approaches to deal with the identification issues discussed above. First, we estimate the differential evolution of plant-level TFP over our sample period for firms producing in export-oriented, import-competing and other tradable sectors. This is a rather flexible parameterization of the effects of trade on plant efficiency. However, it does not take into account the swings that trade protection has experienced in Chile since the mid-1970s. Although Chile today ranks highly in an index of free trade policies, tariffs and other key variables did not evolve smoothly towards their current levels[17]. In our second exercise we take into account the dynamics of effective tariff rates as a determinant of the evolution of plant-level TFP.

To follow the evolution of plant TFP producing in traded relative to non traded sectors, we ran fixed effects regressions of plant efficiency. These regressions include time and sector effects, and dummies indicating the trade status of the industry. The regressions also include the interaction of the trade indicator variables with the time dummies. The estimated results show that firms producing tradable goods are many times more productive than plants produc-

[17] See the Index of Economic Freedom developed by the Heritage Foundation (http://www.heritage.org/research/features/index/).

FIGURE 3
PRODUCTIVITY EVOLUTION IN TRADED SECTORS
(Above productivity in non-traded sectors)



ing non-traded goods[18]. Interestingly, the productivity advantage of tradables increased further over the sample period as depicted in Figure 3, which shows the estimated coefficients on the interaction terms (the base case being non-tradable producing plants). After a steep rise over the early 1980s, by 1986 the productivity advantage of traded sectors experienced a downturn. Although the estimated dynamics is not strictly monotonic, plant-level TFP in traded sectors experienced an upward trend in the 1990s relative to non traded sectors. The evolution of TFP in export-oriented, import-competing and other traded sectors was qualitatively the same over the sample period.

These findings suggest that plants did respond to an intensified foreign competition. Possibly these within-plant productivity gains are a result of a reduced cost of foreign capital and intermediate materials, self-selection into international markets, and learning from international buyers, sellers and competitors. A better functioning of financial markets might as well have helped to improve relative productivity if credit flows relatively favored traded sectors.

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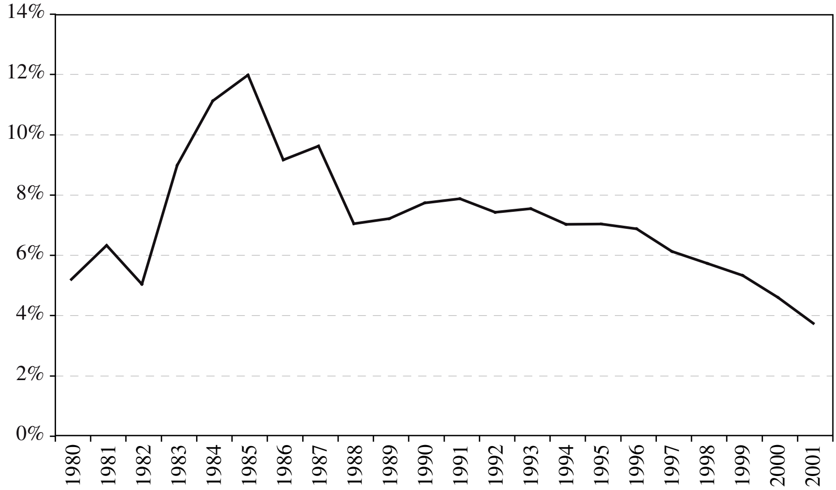
18 Similarly, Bergoeing *et al.* (2010) show that firms that export have a large productivity advantage over non-exporting firms.

FIGURE 4
EFFECTIVE TARIFF IN CHILE



The results in Figure 3 do not take into account the fact that although trade was initially liberalized in 1976, the deep recession of 1982-83 led the authorities to reverse some of these free trade policies. Figure 4 depicts the effective tariff rate faced by domestic producers over the years 1980 to 2001. Between 1980 and 1982 the effective tariff reached an average of 5.47%. Between 1983 and 1986, this average almost doubled, reaching a level of 10.62%. Only in 1999 the effective tariff recovered the level of 1980. By 2001 and after a number of bilateral trade agreements were signed and fully functioning, the rate had fallen to 3.69%.

These ups and downs in trade policy might explain the swings in the estimated evolution of the relative productivity of traded sectors shown in Figure 3. To explore this hypothesis we ran regressions directly controlling for the evolution of the effective tariff[19]. That is, we estimated the following model for the natural log of productivity of plant i in sector j, and year t,

$$p_{ijt} = \varphi_i + \delta_j + \mu_t + \psi \cdot \text{size}_{ijt} + \beta \cdot \text{traded}_j + \gamma \text{traded}_j \text{effective\_tariff}_i + \varepsilon_{ijt}$$

where $size_{ijt}$ is the logarithm of the total employment of plant i in sector j and year t[20], $traded_j$ is a dummy or a vector of dummies indicating the trade status of sector j, and $effective\_tariff_t$ is the level reached by the effective tariff in

[19] Anderson and Neary (2005) discuss the drawbacks of the use of effective tariffs and other standard measures of trade protection whenever there are multiple trade barriers.

[20] There's some evidence in Alvarez (2007) that productivity is positively related to firm size, measured by its employment. We add the log of the employment to control for this effect.

year t[21]. We use data for two subsamples: the one starting in 1983 (to avoid the particularly abnormal period of 1981-82) and the one starting in 1990 (the logic for this analysis will become evident later on).

Columns (1) to (4) of Table 3 display our estimation results. The first column shows that a one percentage point rise in the effective tariff rate reduces productivity in traded sectors by two percentage points. The sign of this effect indicates that on average, traded sectors benefit from trade exposition. The estimated effect is precisely estimated and statistically significant. The second column of Table 3 allows for a differential impact of tariffs on export-oriented, import-competing and other traded sectors. The results reveal that these sectors respond in similar ways to trade protection: the productivity of export-oriented, import-competing, and other traded sectors all are significantly reduced as tariffs rise.

These results suggest that effective tariffs reduce the efficiency of plants that produce in import-competing sectors. This result is hardly surprising as the protection granted by tariffs reduces the toughness of competition.

Other traded sectors are hurt when effective tariffs rise, possibly because foreign intermediate and capital goods become more costly, and because the reduction in external competition allows the less productive plants to survive. Export oriented sectors are also sensitive to tariffs. Yet, it is likely that our effective tariff measure is a poor proxy of the trade policy faced by exporters, as they respond to the tariffs imposed by other countries, and not to those relevant for local imports. Given that trade policy was undertaken unilaterally over most of the sample period, internal and external tariffs are most likely uncorrelated. Still, the estimates may reflect a similar effect to those related to other tradable products: better access to foreign intermediate and capital goods.

Overall our results show that on average all traded sectors have become more productive, relative to non-traded sectors over our sample period. The results are consistent with the hypothesis that specialization and trade, both in input and final product markets, generate efficiency gains. Our results also show that the response of plant TFP to domestic trade protection is very similar for plants producing in tradable sectors. They suggest that lowering effective tariffs increases the efficiency of plants in all tradable producing plants regardless of whether they are in import-competing, or export-oriented sectors. These gains could potentially be attributed to a variety of reasons. The first may be that the cost of production is reduced whenever tariffs fall and some inputs are imported. Another possible explanation is that reduced protection induces domestic firms to trim their fat as foreign competition increases.

[21] A potential concern with our results is that we are ignoring any dynamic effects. Since productivity tends to be very persistent, one may feel that a dynamic specification should be more appropriate to control for this autocorrelation. However, our estimation procedure for TFP models productivity as following a random walk with Markovian iid innovations. Thus the persistence related to production and investment decisions is already controlled for by the procedure. Therefore, there should be no need to explicitly control for persistence or trends beyond the period fixed effects. Still, as a check, we estimated the model using a dynamic panel specification with four lags of the dependent variable and the Arellano-Bond method to correct for the bias present in dynamic panels. The results, presented in the Appendix, are qualitatively the same.

TABLE 3
THE EFFECT OF TARIFFS AND FINANCIAL DEVELOPMENT ON PLANT-LEVEL PRODUCTIVITY

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Tradable	2.150 (0.061)		2.320 (0.073)					
Tradable*Tariff	–1.917 (0.243)		–3803 (0.448)					
Export Oriented		3.087 (0.088)		3.296 (0.101)			3.147 (0.088)	3.313 (0.101)
Export Oriented*Tariff		–1.695 (0.258)		–3.341 (0.478)			–1.681 (0.258)	–3.393 (0.478)
Import Competitive		3.375 (0.100)		3.408 (0.113)			3.519 (0.101)	3.425 (0.113)
Import Competitive* Tariff		–0.940 (0.276)		–3.853 0.508)			–0.849 (0.276)	–3.557 (0.522)
Other tradables		3.984 (0.094)		4.164 (0.107)			4.128 (0.095)	4.192 (0.108)
Other tradables* Tariff		–3.358 (0.278)		–4.571 0.518)			–3.322 (0.278)	–4.445 (0.520)
Private Credit by Banks over GDP					0.631 (0.074)		0.638 (0.074)	
Private Bond Mkt. Capitalization over GDP						0.658 (0.185)		0.481 (0.199)
Size (Ln of Employment)	–0.032 (0.004)	–0.031 (0.004)	–0.046 (0.005)	–0.045 (0.005)	–0.032 (0.004)	–0.047 (0.005)	–0.030 (0.004)	–0.045 (0.005)
Sample years	1983-2001	1983-2001	1990-2001	1990-2001	1983-2001	1990-2001	1983-2001	1990-2001
N	74022	74022	48045	48045	74022	48045	74022	48045
R^2	0.880	0.880	0.870	0.870	0.879	0.870	0.880	0.870

All regressions include sector and year fixed effects.

(b) The role of financial markets development

Poorly functioning financial markets limit the creation of new firms as they lack the necessary funds for project finance. Similarly, credit constrained incumbents face limits to their ability to adopt new technology, to retool and to grow. Starting in the mid 1980s, Chile experienced an investment boom associated to the deepening of financial markets, the entry of foreign finance, the privatization of the public pension system and a tax reform that promoted firms' saving[22].

In this section we examine whether financial development facilitated within-plant productivity growth. In assessing the effects of a better access to financial markets on micro efficiency, we follow the literature on imperfect capital markets, based upon the hypothesis that asymmetric information and incentive problems in financial markets imply that agency costs and the internal resources of a firm influence the cost of external funds. Capital market deepening reduces the extent of these agency problems, and thus the cost of funds. Therefore, when credit constraints are relaxed, the funds available for all firms increase, favoring relatively more those that lack the necessary funds to finance its activities. Thus, plants that are credit constrained are those that are more likely to gain when financial markets deepen.

As discussed above, the identification of financial constraints in micro level panel data is a difficult task. Particularly, many of the measures used in the literature are endogenous. To circumvent these problems, Rajan and Zingales (1998, henceforth RZ) proposed a measure of external financial dependence that is exogenous to any individual firm's growth prospects. Specifically, RZ identify an industry's need for external finance from data on U.S. firms. As the U.S. financial markets are relatively frictionless, an industry's external finance dependence in the American economy is a good proxy for the technological demand for external financing in other economies. RZ use this information to study whether industries that are more dependent on external financing grow relatively faster in countries that are more financially developed. A number of recent papers have used this identification strategy to perform tests of the effects of cross-country differences in financial development[23].

We adapt RZ's strategy to the comparison of plant-level TFP over time within a country. That is, we study the differential impact of Chile's financial development over the 1983-2001 period on sectors with different external finance requirements[24]. We estimate the following model

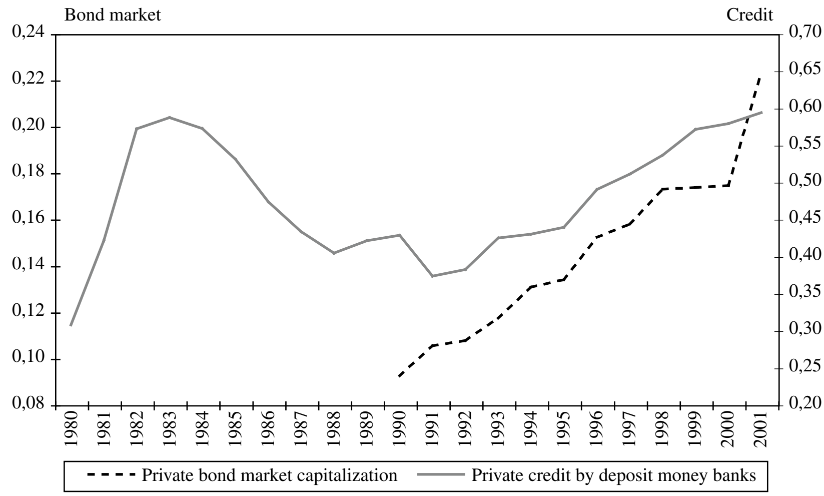
$$p_{ijt} = \varphi_i + \delta_j + \mu_t + \psi \cdot \text{size}_{ijt} + \gamma_t ext_j * findev_t + \varepsilon_{ijt}$$

22 See Coronado (2002) for an analysis of the effects of the privatization of Social Security on savings, and Hsieh and Parker (2008) for an analysis of the role of the tax reforms on the Chilean investment using the ENIA.

23 For instance, see Galindo *et al.* (2002), Fisman and Love (2004), Braun and Larraín (2005), and Hsieh and Parker (2006) for different applications of this identification strategy.

24 Again, we restrict the period of analysis to that starting in 1983 to avoid including the 1982 crisis, an abnormal period.

FIGURE 5
FINANCIAL MARKETS' DEVELOPMENT



where p_{ijt} represents the natural log of plant's i TFP, producing in sector j at time t. The regression includes plant, sector and year dummies. The variable ext_j is RZ's measure of the external financing dependence of sector j, whereas the variable $findev_t$ is a measure of Chile's financial development in year t. In this paper, we use two alternative measures of financial development –private credit by deposit money banks to GDP, and private bond market capitalization to GDP– both taken from Beck *et al.* (2003)[25]. Figure 5 shows the evolution of these measures over our sample period. The figure shows that market depth did not rise monotonically in Chile. There is a rise in the early 1980s and a fall after the massive failure of banks during the 1982-83 crisis. The measures started to recover in the early 1990s only after a number of regulatory changes took place.

Columns (5) and (6) of Table 3 present our estimation results using alternative specifications. In all cases, the coefficient of the interaction variable between external financing dependence and financial development is positive, indicating that the TFP of plants in industries that require more external financing grows faster when capital markets are deeper. We can illustrate the economic importance of the estimated coefficients by comparing the predicted differences in growth rates across sectors. The industry at the 75th percentile of the external dependence distribution is sector 321 (textiles), whereas the industry at the 25th percentile is sector 369 (the manufacture of other non-metallic mineral products). Then the estimated coefficients imply a growth rate of plant-level TFP between 1.3 and 2.2 percentage points higher in sector 321 than in sector 369 whenever the market development indexes increase in 10 percentage points. Recall that according to Figure 5, the private bond market capitalization index grew 13.1 percentage points between 1990 and 2001, whereas the private credit index grew 16.5 percentage points.

25 The latter measure is available since 1990 only.

Our results are consistent with the hypothesis that firms that are credit constrained experienced the largest gains from financial market deepening. In an economy with poorly developed credit markets, actual firms and potential entrants with productive investment projects are unable to raise sufficient external funds to undertake these projects at the efficient levels. By allowing a better access to financial markets, these investment activities have a better likelihood of being implemented and to result in an improvement in plant productivity.

Finally, as a robustness check, in columns (7) and (8) of Table 3 we combine the analysis for both policies: tariffs reduction and financial market deepening. The estimation results do not change significantly which implies that each policy is important for explaining TFP dynamics over the considered period.

5. Concluding remarks

In this paper we have examined how structural reforms contribute to productivity using information at the plant level. We find that the Chilean experience provides suggestive evidence on the contribution of market reforms on efficiency gains. In particular, to two key markets –the financial market and the traded goods market– have helped significantly to improve plant efficiency. These efficiency gains may have resulted from the adoption of better technologies and production processes, both by incumbents and new firms. Much research remains to be done, though. For instance, future research should explore alternative identification strategies, possibly taking better advantage of the fact that not all reforms were undertaken at exactly the same time. Similarly, future research should broaden our identification approach based on the fact that the impact of market reforms is likely to depend on plant's characteristics. In addition, the channels through which the reforms spur productivity growth should be disentangled. Moreover, other structural reforms could be studied. Overall, we believe that our results have a clear policy implication: Exposing firms to the best practices is crucial to promote aggregate growth.

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APPENDIX

Tariffs, financial development and plant-level productivity: dynamic model

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Tradable	3.087 (0.114)		2.890 (0.108)					
Tradable*Tariff	−0.455 (0.520)		−10.137 (0.402)					
Export Oriented		2.263 (0.094)		3.627 (0.129)			2.384 (0098)	3.348 (0.148)
Export Oriented*Tariff		−0.735 (0.559)		−8.098 (0.509)			0.654 (0.558)	−3.311 (1.094)
Import Competitive		−6.426 (0.091)		3.605 (0.140)			6.600 (0.097)	3.397 (0.155)
Import Competitive* Tariff		−0.186 (0.573)		−7.913 (0.592)			−0.135 (0.573)	−3.776 (1.128)
Other tradables		3.132 (0.099)		4.451 (0.133)			3.322 (0.108)	4.216 (0.155)
Other tradables* Tariff		−0.292 (0.593)		−7.118 (0.596)			−0.238 (0.593)	−2.530 (1.170)
Private Credit by Banks Over GDP					0.738 (0.146)		0.730 (0.146)	
Private Bond Mkt. Capitalization over GDP						0.301 (0.387)		0.185 (0.407)
Size (In of Employment)	−0.119 (0.006)	−0.119 (0.007)	−0.124 (0.008)	−0.123 (0.008)	−0.119 (0.006)	−0.122 (0.008)	−0.119 (0.005)	−0.122 (0.008)
Ln of Productivity–1	0.052 (0.004)	0.053 (0.004)	0.051 (0.006)	0.049 (0.006)	0.052 (0.004)	0.065 (0.007)	0.053 (0.004)	0.058 (0.007)
Ln of Productivity–2	−0.001 (0.003)	−0.001 (0.003)	−0.002 (0.003)	−0.002 (0.003)	−0.001 (0.003)	−0.001 (0.004)	−0.001 (0.003)	−0.003 (0.004)
Ln of Productivity–3	−0.003 (0.003)	−0.003 (0.003)	−0.002 (0.003)	−0.002 (0.003)	−0.003 (0.003)	0.001 (0.003)	−0.003 (0.003)	−0.001 (0.003)
Ln of Productivity–4	−0.009 (0.002)	−0.009 (0.002)	−0.011 (0.003)	−0.011 (0.003)	−0.009 (0.002)	−0.009 (0.003)	−0.009 (0.002)	−0.010 (0.003)
N	39148	39148	28049	28049	39148	25772	39148	25772

Dynamic model estimated using the Arellano–Bond method.
All regressions include fixed effects.