Does Trade Protection Improve Firm Productivity? Evidence from Philippine Micro Data

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This paper examines the impact of trade policy changes on firm productivity in the Philippines, characterized by an incomplete liberalization process and reversal of policy in midstream. Though the Philippines implemented substantial trade reforms from the 1980s up to the mid-1990s, it adopted a selective protection policy in the early 2000s. The regression results show that among firms in the purely importable sector, trade protection is negatively associated with firm productivity. For firms in the mixed sector, a negative relationship is also present, but is not statistically significant. Among firms in the purely exportable sector, the evidence is weak due to the strong bias of the system of protection against exportable. Coinciding with policy reversal, the aggregate productivity of the purely importable and mixed sectors both declined from 1996 to 2006. In contrast, the productivity of the purely exportable and non-traded sectors increased during the same period. This paper shows that the selective protection policy not only reversed the productivity gains from the previous liberalization, but undermined the output restructuring from less productive to more productive firms that was already underway as the protection of selected sectors allowed inefficient firms to survive.

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1. Introduction

The more recent empirical literature on trade and productivity shows that in the presence of firm heterogeneity, trade liberalization allows more productive firms to expand while less efficient firms either exit or shrink. Trade liberalization may lead to improved productivity through the exit of inefficient firms and the reshuffling of resources and outputs from less to more efficient firms. As Melitz (2002) points out, trade opening may induce a market share reallocation towards more efficient firms and generate an aggregate productivity gain, without any change at the firm level. With the exit of inefficient firms, resources (labor and capital) will be freed and will move to other industries where they can be used more productively. Trade liberalization drives the process of restructuring and reshuffling of resources within and across sectors of the economy such that unprofitable activities contract while profitable ones expand.

Studies indicating that productivity improves following liberalization include Pavcnik (2000) for Chile, Fernandes (2003) for Columbia, Topalova (2003) and Chand and Sen (2000) for India, Amiti and Konings (2004) and Muendler (2002) for Indonesia along with Schor (2003) for Brazil and Ozler and Yilmaz(2001) for Turkey. In India, Krishna and Mitra (1998) and Goldar and Kumari (2003) also found evidence of a significant favorable effect of reforms on industrial productivity. In Korea, Kim (2000) found that trade liberalization had a positive impact on productivity performance. Earlier works by Haddad (1993), Harrison (1994), and Tybout and Westbrook (1995) for the Ivory Coast and Mexico also showed a positive link between liberalization and productivity growth.

There are however, studies that showed the opposite. Bernard and Jones (1996) found weak support for productivity improvements after trade liberalization.Rodrik (1988, 1992) argued that there are no reasons to believe that protection discourages productivity improvement. In fact it is import liberalization that retards productivity growth by shrinking domestic sales and reducing incentives to invest in technological efforts.Thus whether liberalization really improves efficiency in less developed countries is ambiguous and has remained an empirical question.

As with many developing countries and transition economies, the Philippines

opened up its domestic economy to international trade starting in the 1980s. Studies on trade and productivity are few and mostly based on macro level analysis (Kajiwara 1994, Urata 1994, Tan 1997, Austria 1998, and Cororaton and Abdula 1999). Medalla*et al.* 1995; Pineda 1997; and Medalla 1998 carried out industry based analysis that examined the impact of trade liberalization on resource allocation. Hallward-Driemeier, M. *et al.* (2002) conducted a cross-country study including the Philippines. Their results showed that exporters are significantly more productive than non-exporters that sell only in the domestic market and productivity gaps are larger the less developed the domestic market is.

This paper will focus on the assessment of the impact of trade policy changes on firm productivity in the Philippine manufacturing industry using micro level data.The Philippines presents an interesting case due to its adoption of selective protection amidst an on-going trade liberalization process.Though substantial reforms were carried out from the late 1980s to the mid-1990s, it reversed its trade policy in the early 2000s.

A firm-level panel dataset covering the manufacturing industry was created based on the survey and census data of the National Statistics Office for the period 1996 to 2006 (with missing years for 1999, 2001, and 2004). The paper is divided into 6 sections. After the introduction, section 2 discusses the various episodes of trade policy reforms and analysis of the performance and structure of the manufacturing industry. Section 3 provides a brief review of the trade and productivity studies in the Philippines. Section 4 presents the methodology and descriptionof the data used in the paper. Section 5 analyzes the results, and section 6 summarizes the findings and policy implications of the paper.

2. Trade Policy Reforms in the Philippines

2.1. Trade Policy Reforms: 1980s-2000s

Initiated in 1981, the first tariff reform program (TRP 1)substantially reduced the average nominal tariff and the high rate of effective protection that characterized the Philippine industrial structure. The second phase of the tariff reform program (TRP II) was launched in 1991. It introduced a new tariff code that further narrowed down the tariff range with the majority of tariff lines falling within the 3 to 30 % tariff range. The government initiated another round of tariff reforms (TRP III) in 1995 as a first major step in its plan to adopt a uniform 5% tariff by 2005. This further narrowed down the tariff range for industrial products to within 3 and 10% range and reduced the ceiling rate on manufactured goods to 30 % while the floor remained at 3%.

In 1996, Republic Act 8178 legislated the tariffication of quantitative restrictions imposed on agricultural products andthe creation of tariff quotas. Tariff quotas imposed a relatively lower duty up to a minimum access level (or in-quota rate) and a higher duty beyond this minimum level (or out-quota rate).

In January 1998, Executive Order 465 was legislated to further refine the tariff structure and gradually implement the tariff reduction on 23 industries identified as export winners.In 1999, Executive Order 63 was issued to increase the tariff rates on certain products and froze tariff rates at their 2000 levels. In January 2001, EO 334, which was to constitute TRP IV, was passed to adjust the tariff structure towards a uniform tariff rate of 5 % by 2004. This was never implemented, as a series of executive orders were passed to either postpone or increase tariff rates on selected products. In 2003, a comprehensive tariff review was carried out which culminated in the legislation of Executive Orders 241 and 264. These Executive Orders modified the whole tariff structure such that the tariff rates on goods that are not locally produced goods were made as low as possible while the tariff rates on locally produced goods were adjusted upward.

2.2. Structure of Protection: 1998-2004

Table 1 shows that the overall level of tariff rates is already low. As of 2004, the average tariff rate for all industries is 6.82 %. The average for manufacturing is almost the same as the average for all sectors at 6.8 %.Agriculture has the highest average tariff rate of 11.3 %. Unlike the rest of the sectors where ad valorem tariffs are applied, tariff quotas are used in agriculture.

Table 1. Average Tariff Rates: 1998-2004

	1998	1999	2000	2001	2002	2003	2004
All Industries	11.32	10.25	8.47	8.28	6.45	6.6	6.82
Coefficient of variation	0.96	0.91	0.99	1.04	1.17	1.06	1.07
% of tariff peaks	2.24	2.24	2.48	2.5	2.69	2.53	2.71
Agriculture	15.9	13.2	11.5	12.3	10.4	10.4	11.3
Coefficient of variation	1.07	1.14	1.3	1.23	1.31	1.22	1.17
Fishing and forestry	9.4	8.9	6.7	6.7	5.8	5.7	6
Coefficient of variation	0.63	0.7	0.66	0.62	0.45	0.48	0.57
Mining and quarrying	3.3	3.3	3.1	3.2	2.8	2.7	2.5
Coefficient of variation	0.42	0.41	0.24	0.23	0.38	0.4	0.48
Manufacturing	11.38	10.35	8.5	8.28	6.39	6.57	6.76
Coefficient of variation	0.93	0.88	0.95	1	1.13	1.03	1.03

Aldaba (2005).

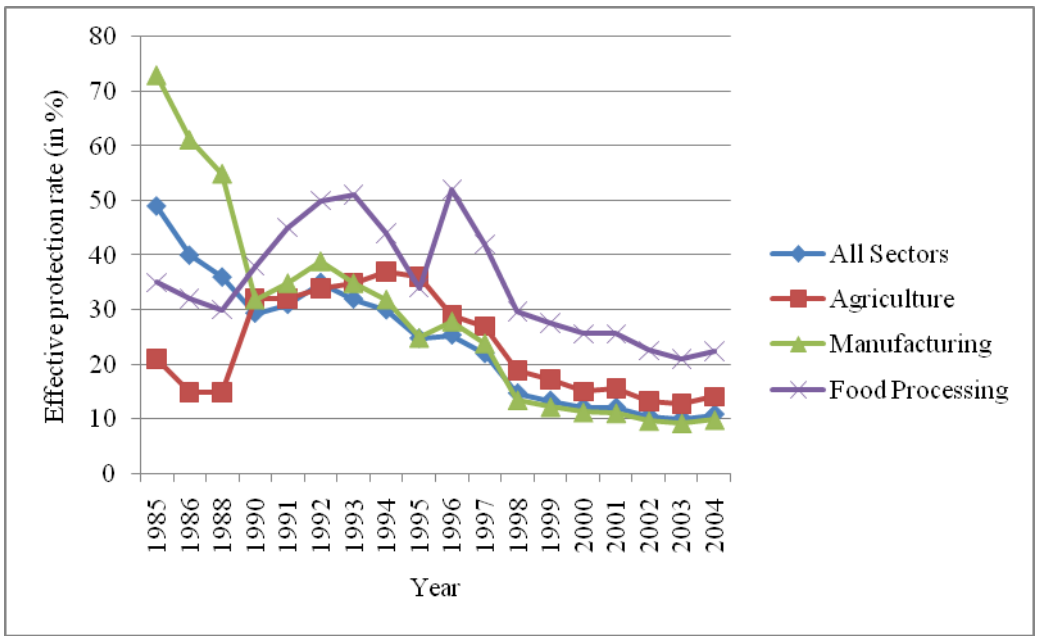
Note, however, that a lower level of tariff rates does not always imply that the tariff schedule is less distorting. The economic and trade distortions associated with the tariff structure depend not only on the size of tariffs but also on the dispersion of these tariffs across all products. Common measures of dispersion used are percentage of tariff peaks and coefficient of variation. In general, the more dispersion in a country's tariff schedule, the greater the distortions caused by tariffs on production and consumption patterns. As Table 1 shows, while the average tariff rate for all industries dropped from 11.32 % in 1998 to 6.82 % in 2004, tariff dispersion widened as the coefficient of variation went up from 0.96 to 1.07. The ad valorem tariffs for mining and quarrying as well as those for fishing and forestry show the most uniformity, while those for agriculture and manufacturing exhibit the widest dispersion.

Table 1 also indicates an increase in the percentage of tariff peaks (tariffs that are greater than three times the mean tariff) from 2.24 in 1998 to 2.71 in 2004. The sectors with tariff peaks consisted mostly of agricultural products with in- and out- quota rates along with manufacturing sectors such as slaughtering and meat packing, coffee roasting and processing, meat processing, canning and preserving fruits and vegetables, manufacture of starch and starch

products, bakery products animal feeds, miscellaneous food products, drugs and medicines, chemical products, and assembly of motor vehicles.

Compared to tariff rates, effective protection rates (EPRs)[2] provide a more meaningful indicator of the impact of the system of protection. EPRs measure the net protection received by domestic producers from the protection of their outputs and the penalty from the protection of their inputs. Figure 1 shows that average effective protection rates for all sectors declined from 49% in 1985 to 36% in 1988. In 1995, this further dropped to around 25% and to 15% in 1998 and to 10.9% in 2004.

Figure 1. Effective Protection Rates (1985-2004)



Source: Medalla, et al (1995), Manasan, R. and V. Pineda (1999), and Aldaba (2005).

The country's effective protection has continued to discriminate in favor of some industries and against others, and in favor of sales in the domestic market against sales in other markets. This implies that there is a strong incentive to misallocate resources. There are two elements of bias in the effective protection structure, one is the bias in favor of agriculture and food manufacturing, and two, anti-export bias (artificial incentive to produce for the domestic market) or penalty imposed on exports as they

[2] EPRs are rates of protection of value added, are more meaningful than actual tariff rates and implicit tariff rates (representing excess of domestic price of a product over its international price) since it is value added rather than the value of the product that is contributed by the domestic activity being protected.

continue to receive negative protection. That these industries have continued to survive suggests that they are economically efficient. This is in contrast to those sectors that have received relatively higher protection but have not exported to any significant extent. To address the problem of exporters being disadvantaged by the system of protection, the government has provided incentive mechanisms such as duty drawbacks, bonded manufacturing warehouses, and export processing zones to allow exporters duty-free importation of inputs.

Table 2 presents the average EPR for the years 1998 to 2004. Though the average EPR for all industries is already relatively low, protection continues to be uneven as indicated by the high levels of coefficients of variation, particularly in manufacturing. After falling from 3.68 in 2000 to 2.54 in 2001, it increased to 2.64 in 2004. Among the major economic sectors, agriculture continued to enjoy the highest level of protection from 1998 to 2004. Protection of importable also remained relatively higher than exportable. Manufacturing exportables continued to register negative EPRs indicating that they were penalized by the system of protection.

Table 2. Average Effective Protection Rate

	1998	1999	2000	2001	2002	2003	2004
All Sectors	**14.75**	**13.41**	**12.13**	**12.18**	**10.55**	**10.11**	**10.88**
Importable	25.64	23.45	21.21	21.11	18.82	18.05	19.09
Exportable	3.45	2.99	2.72	2.92	1.98	1.88	2.36
CV	2.82	2.91	3.21	2.19	2.13	2.23	2.27
Agriculture, Fishing, & Forestry	**18.98**	**17.29**	**15.12**	**15.63**	**13.38**	**12.86**	**14.15**
Importable	22.67	20.35	19.01	19.48	17.97	17.26	18.09
Exportable	15.36	14.29	11.31	11.85	8.89	8.55	10.3
CV	0.75	0.71	0.77	0.83	0.88	0.82	0.77
Mining	**2.52**	**2.6**	**2.65**	**2.67**	**2.41**	**2.36**	**2.28**
Importable	3.86	3.8	3.44	3.33	2.77	2.71	2.57
Exportable	2.01	2.15	2.35	2.42	2.28	2.23	2.17
CV	0.79	0.76	0.68	0.66	0.68	0.69	0.69
Manufacturing	**13.61**	**12.34**	**11.37**	**11.23**	**9.79**	**9.36**	**9.96**
Importable	27.3	25.1	22.48	22.17	19.53	18.72	19.87
Exportable	-1.57	-1.81	-0.96	-0.89	-1.02	-1.02	-1.04
CV	3.27	3.4	3.68	2.54	2.45	2.58	2.64

Source: Manasan, R. andV.Pineda (1999), Aldaba (2005).
Note: CV or coefficient of variation is the ratio of the standard deviation to the mean.

3. Empirical Framework and Data Description

3.1. Methodology

Following Pavcnik (2000), the paper will first estimate total factor productivity using the methodology of Levinsohn and Petrin(2003).Second, the estimated aggregate TFP is decomposed to understand the factors that underlie the changes in TFP growth and examine the importance of the contribution of resource reallocation within industries to productivity growth. Third, the correlation between trade liberalization and productivity is examined in a regression framework by industry trade orientation and by usingeffective protection rate as a trade proxy. Pavcnik used dummy variables as a measure of trade policy. In the case of the Philippines, applying trade orientation dummy variables might not correctly capture the changes in tariffs and protection since the trade liberalization program was carried out in various stages at an uneven pace across industries from the early 1980s to the 1990s. This is different from Chile's trade liberalization experience that occurred in one big bang from 1974 to 1979 with the adoption of a uniform 10% tariff in 1979. In other studies that measure the impact of trade liberalization on productivity, nominal tariffs are applied. Amiti and Konings (2004) used both input and output tariffs in Indonesia while Topalova(2003) employed nominal tariffs on finished goods in India.

Effective protection rates take into account both the tariff on the firm's output and the tariffs on the inputs that the firm uses. EPRs are important because tariffs vary considerably along the production stage generally exhibiting an escalating structure with inputs having lower protection while final goods receive higher protection. For instance, in 2004, the tariff rate on completely knocked down (CKD) packs was 3%, the