Effects of Industrial Policy on Productivity: The Case of Import Quota Removal during Postwar Japan

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Abstract

This paper attempts to provide a systematic analysis on the effects of industrial policy in postwar Japan. Among the various types of Japanese industrial policy, this paper focuses on the removal of de facto import quotas through the foreign exchange allocation system. Analyzing a panel of 100 Japanese manufacturing industries in the 1960s, we find that the effects of the quota removal on productivity were limited: the effects were significantly positive but it took time before they appeared. On the other hand, the effects of tariffs on labor productivity were negative although these were insignificant. One possible reason for this is that the Japanese government increased tariff rates before removing the import quotas, and maintained high tariff rates afterward. As a result, the effects of the Japanese industrial policy in the 1960s might be smaller than widely believed in the Japanese economic history literature.

Keywords: Import quota, Industrial Policy, Productivity, Postwar Japan
JEL Classification Code: F1, N15

1. Introduction

To quantify the effects of industrial policies is one of the most important research issues in the various fields of economics, including industrial organization, international economics, development economics, and economic history (Noland and Pack, 2003). Of the industrial policies applied in various periods and countries, one of the most controversial is Japanese industrial policy during the postwar period.[1] This controversy arises because the success of some Japanese industrial policies has been used to justify targeting policies in other countries, including the United States.[2] Accordingly, several studies have attempted to quantify the effects of Japanese industrial policy (e.g., Beason and Weinstein, 1996; Kiyota and Okazaki, 2005, 2010). From these studies, we have learned that, although Japanese industrial policy may have contributed to the growth of labor productivity, it did not contribute to the growth of total factor productivity (TFP).

Even though these previous studies are insightful, there is some room for improvement. For example, Beason and Weinstein (1996) utilized relatively aggregated industry-level data (13 manufacturing industries). This makes it difficult to control for heterogeneity within those aggregated industries, despite the fact that targeting was conducted at a detailed industry level. Kiyota and Okazaki (2005) utilized firm-level data, but the industrial policy they focused on was implemented at a specific point in time. This means that they did not exploit any time variation. Kiyota and Okazaki (2010) also utilized different firm-level data and identified the government control at the firm level. However, the analysis is limited in its scope in the sense that they focused only on the cotton spinning industry.

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[1] The Japanese government implemented an industrial policy to control international trade, investment, technology imports, and foreign exchange (Noland and Pack, 2003, pp. 23–37).
[2] "In fact, it is the success of Japanese targeting that is often used as the justification for targeting in the United States" (Beason and Weinstein, 1996, p. 286).

Building upon these studies, this paper attempts to provide a more systematic analysis of the effects of industrial policy during the postwar period in Japan. Among various types of Japanese industrial policy, this paper focuses on the removal of de facto import quotas through the foreign exchange allocation system.[3] As we discuss below, de facto import quotas through the foreign exchange allocation system were utilized as a powerful tool for industrial policy in the 1950s, and hence their removal was supposed to have a substantial impact on industries. Therefore, the removal of the quotas was an important industrial policy issue. The timing of the quota removal varied across industries, implying that this policy has both time and cross-sectional variations within and across industries.[4] It is remarkable that we can precisely identify the timing of the quota removal for each commodity, using original documents of the Ministry of International Trade and Industry (MITI). Moreover, this paper utilizes detailed industry-level data from the *Census of Manufactures*, matching the information on trade protection (i.e., tariff rates and import quotas). This enables us to control for industry heterogeneity while covering the majority of manufacturing industries, and thereby to overcome the problems of the previous studies stated above.

Several studies have discussed the removal of import quotas during the postwar period in Japan. For example, Itoh and Kiyono (1988) and Nakakita (1993) emphasized the positive effects of quota removal, using a simple descriptive analysis, and this view has been widely accepted. However, this is a problem because the period of the quota removal coincided with a period of high economic growth in Japan. The arguments given

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[3] The effects of trade protection (or trade liberalization) are important issues not only in the literature on international trade but also on economic history. See, for example, Grant and Thille (2001), Irwin (2007), and Davis and Irwin (2008).
[4] In this paper, the year when import quotas were removed is defined as the year when protection by de facto import quotas through the foreign exchange allocation system was removed. A more detailed explanation will be provided in Section 2.

in previous studies may be attributable to the spurious correlation between the quota removal and economic growth. To control for factors other than the quota removal, more careful quantitative analysis is needed.

To examine the effects of quota removal, we follow the empirical framework of Head and Ries (1999). Their study tested whether or not the observed trend in output per plant and the number of plants are systematically related to tariff reductions in Canada, using industry-level data. They found that output increased while the number of establishments decreased in the Canadian manufacturing sector after trade liberalization. Their result indicates that a smaller number of establishments came to produce at a larger scale after trade liberalization, which they called the rationalization effect. Our study asks whether or not such effects are confirmed during 1960–1969 in Japan.

This paper is organized as follows. Section 2 reviews the removal of import quotas in Japan. Section 3 explains the empirical methodology and data. Section 4 presents the estimation results. Conclusions are presented in Section 5.

2. The Removal of Import Quotas in Postwar Japan: A Historical Review

This paper examines Japan's dramatic move from import quota protection to tariff protection in the postwar period. This section argues that the case of postwar Japan provides an excellent opportunity to explore the effects of quota removal.

After direct control of international trade by the government ceased in 1949 as a part of the "Dodge Plan," the Japanese government regulated trade indirectly through the allocation of foreign exchange.[5] That is, all the foreign exchange was at once held by either the government, the Bank of Japan, or foreign exchange banks, and the government

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[5] The description of foreign exchange regulations below relies on Naoi and Okazaki (2013) and Okazaki and Korenaga (1999). See also Inuta (2000) pp. 38–53.

created a "foreign exchange budget" to allocate foreign exchange. The foreign exchange budget was composed of the budget for service imports and that for commodity imports, which in turn was composed of the budget for "foreign exchange allocation system goods" (hereafter, FA goods) and that for "automatic approval system goods" (hereafter, AA goods).

Whereas imports of AA goods was de facto free within the total limit of the AA budget, the FA budget was allocated to each good, namely to coal, steel, etc., for instance. Hence, for FA goods, the upper limit of the import quantity was determined by the foreign exchange budget, given the import price. This implies that there was a de facto import quota for FA goods. Furthermore, to import FA goods, one should apply to MITI to have an allotment of foreign exchange ex ante. In other words, MITI had the authority to control each firm's imports of FA goods. In this sense, classification between FA goods and AA goods was crucial. MITI decided the classification for all import goods, and announced it, when it was revised (*Import Proclamation*, *Yunyu Kohyo*). De facto import quotas on each FA good by the foreign exchange allocation system generated rent by raising their domestic prices. This rent was captured by the firms that were allocated foreign exchange for importing the goods as well as the domestic producers of the goods, to the extent that the import quantity was restricted. Usually, foreign exchange for importing a certain good was allocated to the trading companies that would import it and the firms that would use it as an input (Okazaki and Korenaga, 1999).

In the context of the international trade and finance regime, this system was based on Article 14 of the Agreement of the International Monetary Fund (IMF) and Article 8 of the General Agreement on Tariffs and Trade (GATT), which allowed a member country "transitional arrangements" to impose restrictions on foreign exchange and international

trade. Japan had been allowed this arrangement because it participates in the IMF and GATT; however, as the Japanese economy recovered from the war to grow quickly and resolve the persistent deficit in its balance of payments in the late 1950s, the IMF and foreign countries began to request that Japan liberalize international trade (MITI, 1991, pp. 171–173; Customs and Tariff Bureau, Ministry of Finance (MOF), 1972, pp. 314–323).

Under these circumstances, the Japanese government approved the "Outline of the Plan for Trade and Foreign Exchange Liberalization" ("Boeki Kawase Jiyuka Keikaku Taiko"—"Outline" hereafter), where it committed that the "liberalization rate" should be raised to 80% in three years. "Liberalization rate" here is the ratio of imports of AA and "automatic foreign exchange allocation" goods (hereafter, AFA goods) to total imports, which was 41% in July 1960. AFA goods is a category introduced in 1960 as part of the trade liberalization policy. When a firm applied to MITI for a foreign exchange allocation to import goods in this category, foreign exchange was allocated automatically, and hence trade of AFA goods was regarded as "liberalized" (MITI, 1961, p. 51; Customs and Tariff Bureau, MOF, 1972, p. 327).

With continuing pressure from the IMF, the Japanese government swiftly changed the classification of certain goods from the FA category to the AA and AFA categories in 1961 and 1962, and consequently the liberalization rate increased to close to 90% by the end of 1962 (Table 1). Given these changes, in April 1964, the foreign exchange budget system was abolished, and for the remaining FA commodities, the import quota system was introduced (Japan Tariff Association, 1964, pp. 139–140).

=== Table 1 ===

5

While removal of import quotas proceeded swiftly, it is notable that this process was different from what the literature in economics refer to as "trade liberalization." That is, the "Outline" pointed out the need for revision of tariffs as well as the removal of import quotas. It stated: "as direct regulations on import quantities are mitigated, the role of tariffs for industrial policy becomes more important," and "because many of the commodities to be liberalized need tariff protection, we will revise the Tariff Rate Law from the standpoint of boosting liberalization."[6] Following the recovery of currency convertibility by European countries in 1958, the Japanese government and business community became interested in reviewing the tariff system. Under the de facto import quotas by the foreign exchange allocation system, the role of tariffs in the protected industries was limited; however, as this system was not expected to continue, they sought an alternative protection measure.

In April 1960, MOF consulted with the Tariff Rate Deliberation Council (Kanzeiritsu Shingikai) about changes to the tariff system to cope with the removal of import quotas, given the changes in the industrial structure of Japan. The Council sent a report to the Minister of Finance in December 1960, and a new tariff system was introduced in June 1961 based on the report. This was the first major revision to the tariff system since the last revision in 1951, when Japan was still under Allied occupation (Asai, 2007, pp. 42–46; Customs and Tariff Bureau, MOF, 1972, pp. 450–451, p. 469). The basic idea of the 1961 revision was as follows:

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[6] *Outline of the Plan for Trade and Foreign Exchange Liberalization* (*Boeki Kawase Jiyuka Keikaku Taiko*, printed by the Economic Planning Agency (1960, pp. 17–18). Furthermore, in the 1960 issue of *White Paper on International Trade*, MITI noted: "With the abolition of quantitative import restrictions, the industrial policy role of tariffs, namely protecting developing industries important to the national economy, becomes particularly important" (MITI, 1961, pp. 64–65).

1) Protection of growing infant industries from the standpoint of the industrial structure policy;

2) Protection of stagnating and declining industries to support changes in employment patterns;

3) For the other industries, tariff rates should be minimized for expansion of trade, rationalization of industries, and the benefit of consumers.

Of a total of 2,235 commodities in the tariff table, tariff rates were increased for 251 commodities, they were decreased for 386 commodities and unchanged for 1,596 commodities, and specific tariffs were introduced for 77 commodities (Customs and Tariff Bureau, MOF, 1972, pp. 468–469).

Figure 1 presents the average tariff rate, namely the tariff revenue divided by the total import volume and import volume of the commodities with tariffs. In this figure, we do not observe a substantial change in 1961 or 1962. In fact, the increase in 1959 is much clearer. Most of the increase in the average tariff rate in 1959 was due to the increase in the sugar tariff. In that year, the sugar tariff was increased from 14.0 yen/kg to 41.5 yen/kg, and the ratios of sugar tariff revenue to the import volume of commodities with tariffs in 1958 and 1959 were 4.4 and 7.7, respectively.[7]

=== Figure 1 ===

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[7] The data on sugar tariff revenue are taken from the Tax Bureau of the MOF (1961); the data on the import volume of commodities with tariffs are taken from the MOF ed., *Monthly Bulletin of Financial Statistics*, vol.144, 1963, p. 80.

The 1961 tariff changes did not have a visible impact on the average tariff rate, however the distribution of tariffs changed substantially. Figure 2 compares the distributions of tariff rates on all the individual commodities before and after the 1961 tariff change. It is seen that the distribution clearly shifted to the right. In particular, the mode moved from 11–15% to 20%. Furthermore, in April 1962, an additional major tariff change was implemented. One of the reasons for this change was that there were many commodities whose tariff rates were not changed in 1961 due to the lack of consensus on the appropriate tariff rates.. Furthermore, this change was motivated by the government's decision to accelerate deregulation in September 1961, which set a new target of raising the liberalization rate up to 90% by October 1962. The 1962 change was clearly intended to protect the industries quantitative restrictions which had been or would be removed. Of 133 commodities whose tariff rates were changed, the tariff rates were raised for 79 commodities, while the tariff rates were decreased for 32 commodities (Customs and Tariff Bureau, MOF, 1972, p. 490).

=== Figure 2 ===

These historical reviews together suggest that the removal of import quotas does not necessarily constitute trade liberalization because tariff protection was substituted for import quotas. In other words, to quantify the effects of the quota removal correctly, we need to control for the effects of tariff protection. In the following sections, therefore, we examine the effects of the quota removal, controlling for the effects of tariff protection.

3. Methodology and Data

3.1. Methodology

The analysis of this paper follows that of Head and Ries (1999). To examine the effects of the quota removal, we include an import quota removal dummy that equals 1 if an import quota was removed and 0 otherwise. The regression equation is as follows:

$$\ln Z_{it} = \alpha_i + \beta_t + \gamma \tau_{it} + \lambda d_{it} + \epsilon_{it}, \tag{1}$$

where i and t represent the industry and year, respectively; Z_{it} is the performance of industry; α_i and β_t are industry and year fixed effects, respectively; τ_{it} is the industry tariff rate; τ_{it} is a quota removal dummy; and ϵ_{it} is the error term.

For the performance of the industry Z_{it}, following Head and Ries (1999), we utilize output per establishment and the number of establishments. We also use output (shipment), value added, employment, and labor productivity.[8] The parameters of interest are γ and λ, namely the coefficients of the two industrial policy variables (tariffs and import quota dummy).

As we include industry fixed effects, the effects of industrial policy are estimated by using time-series variation. The year dummies capture influences common to all industries. Tariffs are measured in fraction terms. Therefore, the semi-log specification implies that each one percentage point reduction in the ad valorem tariff changes the performance of the industry by $\gamma\%$.

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[8] All variables are at the industry level.

3.2. Data

Industry Samples

We collected data on the number of establishments, the number of employees, sales, and value added of manufacturing industries at the 4-digit level for the period from 1960 to 1969, from the industry volume of the *Census of Manufactures* (*Kogyo Tokei Hyo*). At the 4-digit level, there are 558 manufacturing industries. We focus on the 100 largest industries in terms of sales in 1960.[9] Industries whose complete information is not available are excluded from the sample.[10] Next, using the commodity volumes of the *Census of Manufacturing*, we identified the main product of each industry whose sales were the largest in 1960.

Import quota removal

As stated in Section 2, those goods classified in the FA category were subject to de facto import quotas, while AA and AFA goods were not subject to such quantitative restrictions. Hence, here we examine the impact of removing quantitative import regulations by focusing on the event in which a certain good moves from the FA category to the AA or AFA category.

Then, we explored into which category (AA/AFA/FA) the main product of each industry was classified at the end of each year from 1960 to 1969. The category information was taken from the following official sources. As stated in the previous section, classification of each commodity in terms of the AA/AFA/FA categories was

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[9] The 1960 shares of sales, value added, and employment of these 100 industries are 69.5%, 66.6%, and 56.9%, respectively. The industry classification of the *Census of Manufactures* changed in 1967. We conducted a concordance to trace the same industry throughout the period.
[10] The *Census of Manufactures* conceals the data in the case in which there were fewer than three establishments in an industry for reasons of confidentiality.

obtained from "Import Proclamation" (*Yunyu Kohyo*) by MITI, which, in turn, was made public in the *Official Bulletin of MITI* (*Tsusansho Koho*). After April 1964, the list of the commodities subject to the import quota system was also announced in the *Official Bulletin of MITI*. We examined every issue of the *Official Bulletin of MITI* from 1960 to 1969 to identify the category of each commodity at the end of each year.

Tariff rates

As stated in the previous section, the official materials by MOF and MITI stated that the tariff system was revised to mitigate the impact of removing quantitative restrictions in 1961 and 1962. To examine the effects of tariffs as well as quota removal, we collected the data on the tariff rates on the main products of the 100 largest industries above, from the 1961–1969 issues of *Customs Tariff Schedules of Japan* (*Jikko Yunyu Zeiritsu Hyo* for 1961, and *Jikko Kanzeiritsu Hyo* for 1962–1969).

Industry performance

Following Head and Ries (1999), we measure industry performance by real output, the number of establishments, and real output per establishment. Real output is defined as shipments divided by the wholesale price index. Shipments and the wholesale price index are obtained from MITI (1960–1969) and the Bank of Japan (1987), respectively.

In addition to these industry performance variables, we utilize labor productivity as an additional performance variable.[11] Labor productivity is defined as real value added divided by the number of workers. Real value added, in turn, is defined as nominal value added divided by the sectoral value-added deflator. Nominal value added and

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[11] Information on the capital stock is not available. Therefore, it is impossible for us to estimate total factor productivity.

value-added deflators are obtained from MITI (1960–1969) and the Cabinet Office (2001), respectively.

3.3. Descriptive analysis

Figure 3 presents the number of establishments, shipments (real output), and shipments per establishment from 1960 to 1969.[12] While the shipments grew steadily, the number of establishments was almost constant throughout the period. As a result, the shipments per establishment increased. One notable finding is that there was no "rationalization effect." Head and Ries (1999) found that a smaller number of establishments produced on a larger scale after trade liberalization, which they called the rationalization effect. Such an effect was not confirmed during 1960–1969 in Japan.

=== Figure 3 ===

Table 2 presents the number of industries that removed import quotas in our sample. From this table, we find that eight out of 100 industries removed import quotas before 1961.[13] Between 1961 and 1962, 59 industries removed import quotas. After 82 industries removed quotas in 1965, no industry removed them from 1966 to 1968. In 1969, four industries removed quotas. The remaining 14 industries did not remove quotas throughout the period. In summary, the years when industries removed import quotas were concentrated in the early 1960s, when the Japanese government promoted quota removal according to the "Outline" announced in 1960.

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[12] In Table A1, we present the average of the industry performances, by year. Table A2 presents the correlation matrix of performance and policy variables.

[13] Note that Table 2 focuses on the 100 largest industries, while Table 1 covers all 558 industries.

=== Table 2 ===

Table 3 presents the average tariff rates, by quota removal year cohort. Two findings stand out from this table. First, no drastic changes in tariff rates were confirmed in the year when the associated import quota was removed. In some cohorts, average tariff rates increased in 1961 as we discussed in Section 2, and were virtually constant afterward. Therefore, average tariff rates were *higher* between 1961 and 1968 than in 1960. Tariffs were reduced in all cohorts from 1968 to 1969. As a result, average tariff rates were lower in 1969 than in 1960 in almost all cohorts. Second, industries that removed import quotas in earlier years did not necessarily have lower tariff rates. Therefore, there does not seem to be any systematic relationship between quota removal and tariff rates.[14]

=== Table 3 ===

Table 4 shows the average of industry performance before and after the quota removal. This table shows that the average of real output, the number of establishments, and output per establishment increased after the removal of the import quotas. Similarly, real value added, employment, and labor productivity increased. On the other hand, tariff rates declined. While the level of these variables increased after the quota removal, the growth rate did not show any clear pattern. Nonetheless, the growth rate of industry performance continued to be positive before and after the removal of the import quotas.

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[14] Table A2 indicates that the correlation between tariff rates and the quota removal dummy is –0.072.

13

=== Table 4 ===

One may argue that these results show the positive effects of the quota removal. However, Table 4 presents simple averages and thus does not control for any industry- and year-specific effects. Noting that the period of the quota removal coincided with the age of high economic growth in Japan, the results may simply reflect factors other than the removal of the import quotas. The next section investigates the effects of the quota removal in greater detail.

4. Results

Baseline results

Table 5 contains the estimation results of equation (1). Three findings stand out from this table. First, none of the industry performances are systematically related to the removal of the import quotas. That is, the quota removal did not have significant effects on real output, the number of establishments, output per establishment, real value added, employment, or labor productivity. Second, the effect of tariffs on labor productivity was negative but insignificant. We also run a simple OLS regression, excluding industry and year fixed effects.[15] The OLS estimates indicate that tariff rates have insignificant effects, while the removal of the import quotas has significantly positive effects on labor productivity. These results together suggest that, once we control for industry and year fixed effects, the effects of the quota removal disappear.

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[15] The OLS results are presented in Table A3.

Finally, the tariffs had significantly negative effects on the number of firms, output per establishment, and industry value added. Note that, as we confirmed in Table 3, tariff rates increased from 1960 to 1961 and continued to remain high until 1968. The results thus imply that increases in tariffs have negative effects on the entry of establishments, output per establishment, and value added. However, one may argue the possibility of reverse causality: higher tariffs were imposed on small industries in terms of the number of establishments and value added. This possibility is explored below.

Dyschronous effects

A concern may be that producers knew in advance the schedule of quota removal. In other words, producers may have started the adjustment in year t in advance given the information on tariff rates and the schedule of quota removal in year $t + 1$. As described in Section 2, the government announced the schedule of quota removal in 1960, and this concern is relevant in our context. If this is true, the regression equation (1) could not capture the effects of the quota removal because it assumes that the effects appear simultaneously (in year t).

To address this concern, this paper uses a forward lag of tariff rates and the quota removal dummy:

$$\ln Z_{it} = \alpha_i + \beta_t + \gamma\tau_{it+1} + \lambda d_{it+1} + \epsilon_{it}. \tag{2}$$

Equation (2) could also address the issue of reverse causality. The government imposed

higher tariffs in year $t+1$ if the industry is small in year t. If this is the case, $\gamma > 0$.

Table 6 presents the estimation results of equation (2). Table 6 indicates that none of the coefficients are significant. The hypothesis that producers had already started the adjustment in year t given the information on tariff rates and the schedule of the quota removal in year $t+1$ is rejected. Besides, none of the tariff rates have significant coefficients. It is therefore also rejected that the government imposed higher tariffs for small industries.

=== Table 6 ===

Another concern may be that it takes some time before the effects of the quota removal appeared. To address this concern, this paper uses a lag of the tariff rates and the quota removal dummy:

$$\ln Z_{it} = \alpha_i + \beta_t + \gamma \tau_{it-1} + \lambda d_{it-1} + \epsilon_{it}. \tag{3}$$

Noting that the independent variables are lagged by one year, the independent variables used in this analysis are between 1960 and 1968. The period 1968–1969 when average tariff rates declined is not included in this analysis.

Table 7 shows the estimation results of equation (3). There are two notable findings. First, like the baseline results, we can still confirm the significant negative effects of the tariff rates on the number of establishments and industry value added. This result implies that the entry of new establishments is prevented by the increases in tariffs. Moreover, the increases in tariffs have significant negative effects on industry value added. The effect of

tariffs on labor productivity is also negative, although it is insignificant.

Second, the effects of the quota removal on labor productivity become significantly positive. The coefficients are around 0.08, implying that, on average, the removal of import quotas increased industry productivity by 8%. This result suggests that it may take some time before the effects of the quota removal appear.

=== Table 7 ===

Effects on growth

A related question is whether the removal of the import quotas affects the growth rate because the effects of trade liberalization are sometimes dynamic rather than static.[16] To answer this question, this paper runs the following regression:

$$\ln Z_{it} - \ln Z_{it-1} = \alpha_i + \beta_t + \gamma \tau_{it} + \lambda d_{it} + \epsilon_{it,t-1}. \tag{4}$$

The difference between equation (4) and the baseline regression (i.e., equation (2)) is that the left-hand-side variable is the growth rates of industry performance in equation (4).

Table 8 presents the estimation results of equation (4). The results indicate positive significant effects of the quota removal on the number of establishments and the labor productivity growth. The coefficients of the quota removal dummies for the number of establishments and labor productivity are 0.056 and 0.039, respectively. These results suggest that the growth of the number of establishments and labor productivity increased by 5.6 percentage points and 3.9 percentage points, respectively, after the removal of the

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[16] See, for example, Kiyota (2012) for a survey.

import quotas. The reason why the effects of the quota removal were not captured in the baseline model may be that the baseline model focused on the contemporaneous relationship between the removal of the import quotas and industry performance.

=== Table 8 ===

Differences between the early and late 1960s

One may further argue that the effects of the quota removal are different between the early and late 1960s. As we confirmed in Table 2, the year when industries removed the import quotas varies across industries: Some industries removed the import quotas before 1960, whereas others did so in 1969. Industries whose performance was inferior to other industries might delay the removal of import quotas. Therefore, the positive effects of the quota removal might be identified in the early 1960s. To address this issue, we estimate the following equation:

$$\ln Z_{it} = \alpha_i + \beta_t + \gamma \tau_{it} + \lambda^e d_{it}^e + \lambda^l d_{it}^l + \epsilon_{it}, \tag{5}$$

where d_{it}^e is a dummy variable that equals 1 if import quotas were removed before 1966 and 0 otherwise; and d_{it}^l is a dummy variable that equals 1 if import quotas were removed after 1966 and 0 otherwise ($d_{it} = d_{it}^e + d_{it}^l$). Table 9 presents the estimation results. The results indicate that none of the quota removal dummies have significant coefficients. The results suggest that the effects of the quota removal on industry performance did not change between the early and late 1960s.

18

=== Table 9 ===

In sum, unlike the findings of previous studies, the effects of the quota removal on labor productivity were limited. The effects were significantly positive but they did not appear instantaneously; it took time before the effects appeared. On the other hand, the effects of tariffs on labor productivity were negative although insignificant. In the sample of our analysis, the "rationalization effect" was not confirmed.

One possible reason for this is that the Japanese government increased tariff rates before removing the import quotas, and maintained high tariff rates afterward (Table 3). In other words, the protection continued after the removal of the import quotas. Several studies such as Itoh and Kiyono (1984) and Nakakita (1993) emphasized the positive effects of the quota removal. However, the effects of the Japanese industrial policy during this period might be smaller than widely believed in the Japanese economic history literature.

5. **Concluding Remarks**

This paper attempted to provide a systematic analysis on the effects of industrial policy during the postwar period in Japan. To do that, we focused on the removal of de facto import quotas in the 1960s. Analyzing a panel of 100 Japanese manufacturing industries for 1960–1969, we found that the effects of the quota removal on productivity were limited. The effects were significantly positive but it took time before they appeared. On the other hand, the effects of tariffs on labor productivity were negative although insignificant. In our data sample, the "rationalization effect" did not exist.

One possible reason for this is that the Japanese government increased tariff rates

before removing import quotas, and maintained high tariff rates afterward. Several studies such as Itoh and Kiyono (1984) and Nakakita (1993) emphasized the positive effects of the quota removal on the growth of the Japanese economy. However, the effects of the Japanese industrial policy during this period might be smaller than widely believed in the Japanese economic history literature.

Caveats of this paper worth mentioning are as follows. First, while this paper focused on labor productivity, it is more desirable to utilize total factor productivity (TFP). This is because TFP takes into account factor inputs other than labor. As Kiyota and Okazaki (2005, 2010) found, Japanese industrial policy generally had positive effects on labor productivity but insignificant effects on TFP. The effects of the quota removal on TFP could be different from those on labor productivity.

Second, this paper utilized industry-level data, but recent studies on trade liberalization and productivity utilize firm- or establishment-level data. The use of such micro-level data enables us to control for unobserved firm or establishment heterogeneity. Moreover, the effects of the quota removal may be heterogeneous between large and small firms and/or between productive and less productive firms. To address these issues, it is imperative that the quality and coverage of the historical data be improved and expanded.

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21

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Figure 1. Average Tariff Rates
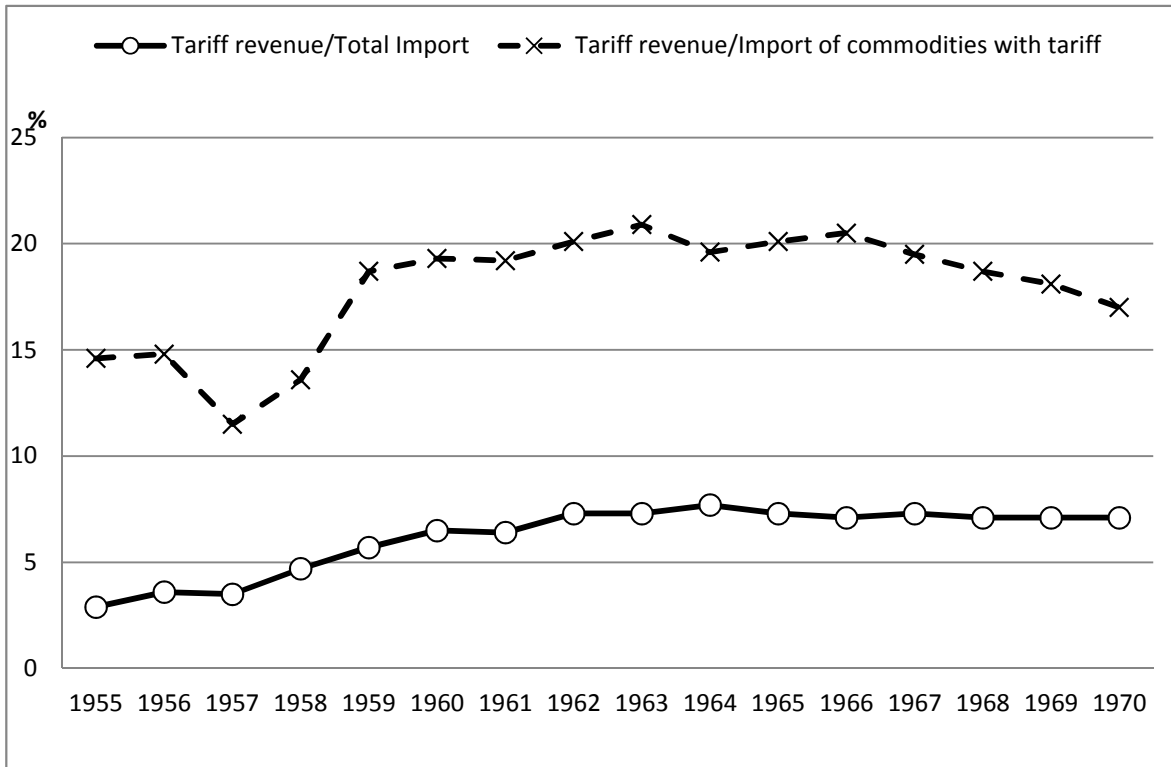
Source: Ministry of Finance (1972) *Montyly Bulletin of Financial Statistics* , 246.

Figure 2. Distribution of Tariff Rates
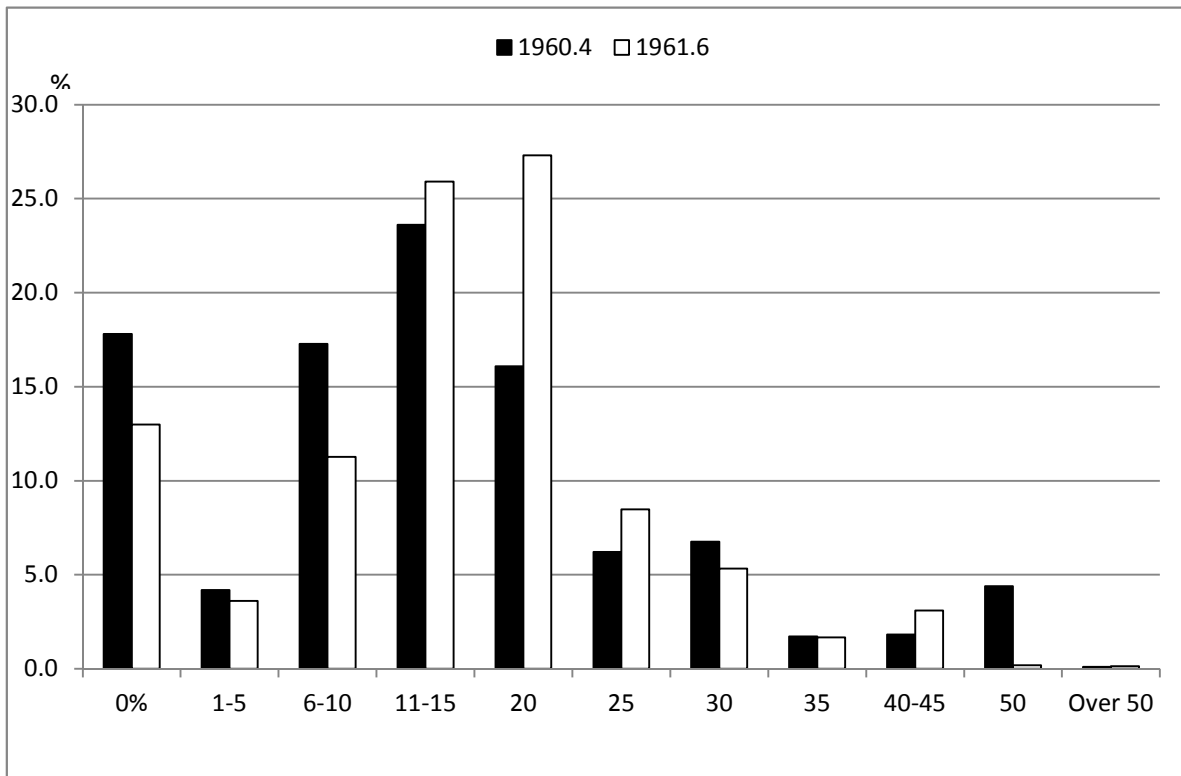
Source: Ministry of Finance (1972), pp. 474-475.

Figure 3. Scale of Japanese Manufacturing, 1960-1969
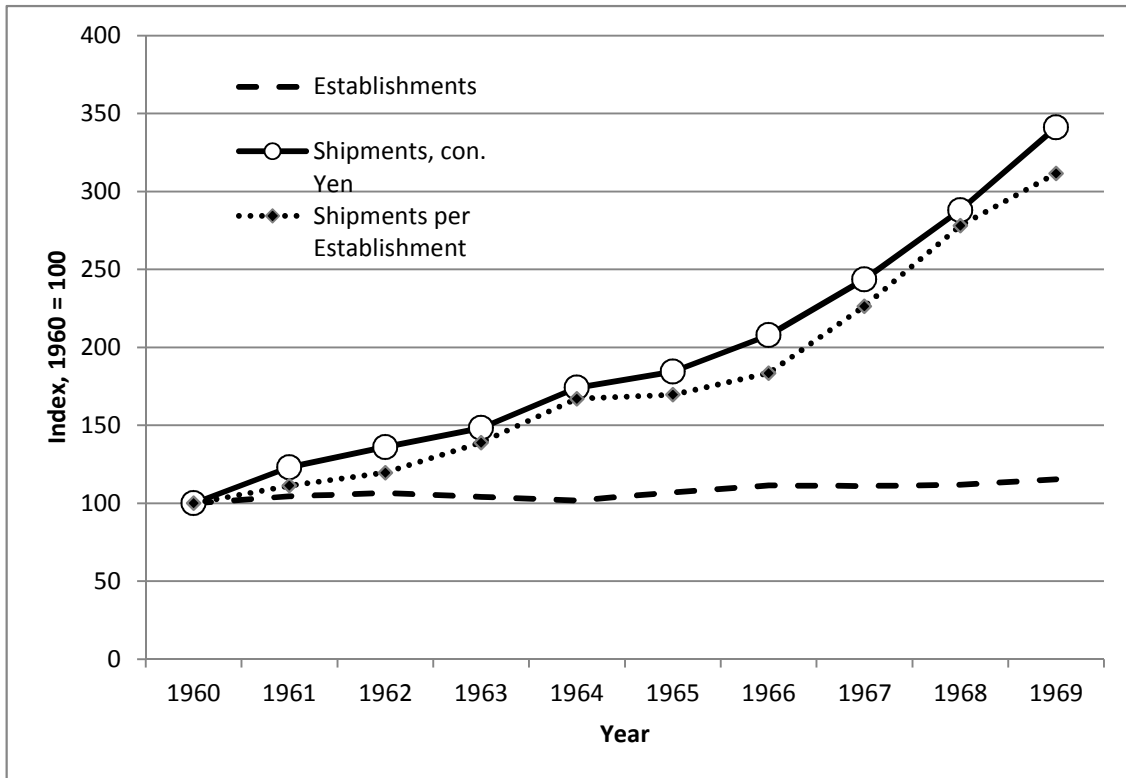
Source: MITI (1960-69).

Table 1. Process of Forign Exchange Liberalization

	Number of AA and AFA goods	Cumulative number of AA and AFA goods	Number of non-AA and non-AFA goods	Foreign exchange liberalization rate (%)
Apr-60	586	1,443	-	41
Jul-60	61	1,504	-	42
Oct-60	481	1,985	-	44
Apr-61	660	2,645	-	62
Jul-61	112	2,757	-	65
Oct-61	500	3,257	-	68
Dec-61	170	3,427	-	70
Apr-62	8	-	492	73
Oct-62	230	-	262	88
Nov-62	8	-	254	88
Apr-63	25	-	229	89
Jun-63	2	-	227	89
Aug-63	35	-	192	92
Jan-64	3	-	189	92
Feb-64	7	-	182	92
Apr-64	8	-	174	93
Oct-64	12	-	162	93
Oct-65	1	-	161	93
Apr-66	2	-	159	93
May-66	0	-	168	93
Oct-66	1	-	167	93
Apr-68	2	-	165	93
Oct-68	1	-	164	93
Apr-69	1	-	163	93
Oct-69	2	-	161	93

Note: AA goods and AFA goods are automatic approved system goods and automatic foreign exchange allocation goods, respectively. Before April 1962, the list of the commodities that had been already liberalized (positive list) was announced, and the classification of commodities were based on SITC (4,120 commodities in total). On the other hand, from April 1962, the list of the commodoties that had not yet been liberalized (negative list) was announced, and the clasiffication standard was changed to four digit classification of BTN (1,097 commodities in total). In May 1966, BTN was revised. SITC refers to the Standard International Trade Classification of the United Nations, while BTN refers to the Brussels Tariff Nomenclature of OECD.

Source: MITI (1970), p.269.

Table 2. Number of Industries that Removed Import Quota

Year when import quota was removed	Industries that removed import quota	Cumulative number of industries that removed import quota	Total number of industries	Share
-1960	8	8	100	0.08
1961	19	27	100	0.27
1962	40	67	100	0.67
1963	3	70	100	0.70
1964	1	71	100	0.71
1965	11	82	100	0.82
1966	0	82	100	0.82
1967	0	82	100	0.82
1968	0	82	100	0.82
1969-	4	86	100	0.86

Note: The year when import quota is removed defined as the year when the protection by a de facto import quota through the foreign exchange allocation system was removed.

Source: MITI (1960-1969).

Table 3. Tariff Rates, by the Quota Removal Year Cohort

Number of industries	Year when import quota was removed	1960	1961	1962	1963	1964	1965	1966	1967	1968	1969
8	-1960	0.138	0.138	0.138	0.138	0.138	0.138	0.138	0.138	0.138	0.110
19	1961	0.216	0.216	0.216	0.253	0.244	0.244	0.240	0.240	0.240	0.202
40	1962	0.162	0.169	0.169	0.169	0.167	0.167	0.167	0.167	0.167	0.139
3	1963	0.150	0.150	0.183	0.183	0.183	0.183	0.183	0.183	0.183	0.151
1	1964	0.500	0.500	0.500	0.500	0.500	0.500	0.500	0.500	0.500	0.460
11	1965	0.136	0.148	0.148	0.148	0.148	0.148	0.148	0.148	0.131	0.127
4	1968	0.225	0.275	0.275	0.275	0.250	0.250	0.250	0.250	0.250	0.213
14	1969-	0.207	0.213	0.213	0.223	0.217	0.217	0.217	0.217	0.217	0.196

Note: Average tariff rates are reported. Shaded cells indicate the year after industries removed import quota.
Source: See Table 2.

Table 4. Summary Statistics: Before and After the Removal of Import Quota

	Level			Growth rate	
	Before	After		Before	After
Real output	149,123	236,899		0.127	0.123
[Q]	(139,162)	(256,668)		(0.152)	(0.158)
Number of establishments	526	976		0.010	0.013
[N]	(720)	(1,568)		(0.119)	(0.091)
Output per establishment	1,688	2,032		0.117	0.110
[q = Q/N]	(3,214)	(6,240)		(0.157)	(0.152)
Real value-added	43,320	81,887		0.132	0.140
[VA]	(38,561)	(89,673)		(0.222)	(0.188)
Employment	36,585	57,290		0.028	0.020
[L]	(30,148)	(51,321)		(0.126)	(0.111)
Labor productivity	1.484	1.734		0.105	0.121
[lp = VA/L]	(1.290)	(1.302)		(0.175)	(0.144)
Tariff rates	0.198	0.180		0.002	-0.003
	(0.123)	(0.112)		(0.034)	(0.030)

Note: Average figures are reported. Growth rates are annual average growth rates.
Figures in parentheses are standard deviations.
Source: See Table 2.

Table 5. Baseline Results

	(1)	(2)	(3)	(4)	(5)	(6)
	lnQ	lnN	lnq	lnVA	lnL	lnlp
Tariff rates	-0.331	-0.463*	-0.288*	-0.272**	-0.058	-0.175
(year t)	(0.216)	(0.260)	(0.162)	(0.121)	(0.236)	(0.162)
Quota removal dummy	-0.046	0.002	-0.054	0.003	-0.049	0.056
(year t)	(0.046)	(0.050)	(0.042)	(0.035)	(0.038)	(0.036)
Observations	1,000	1,000	1,000	1,000	1,000	1,000
R-squared (within)	0.746	0.042	0.775	0.749	0.112	0.825
Number of industries	100	100	100	100	100	100

Note: ***, **, and * indicate statistical significant at 1%, 5%, and 10% levels, respectively. Robust standard errors in parentheses. Year dummies and constant term are not reported.
Source: See Table 2.

Table 6. Dischronous Effects of the Quota Removal: Forward Lag

	(1)	(2)	(3)	(4)	(5)	(6)
	lnQ	lnN	lnq	lnVA	lnL	lnlp
Tariff rates	-0.215	-0.236	-0.192	-0.090	-0.125	-0.045
(year t+1)	(0.180)	(0.223)	(0.139)	(0.179)	(0.284)	(0.139)
Quota removal dummy	-0.033	0.005	-0.052	0.023	-0.056	0.057
(year t+1)	(0.049)	(0.050)	(0.049)	(0.037)	(0.039)	(0.035)
Observations	900	900	900	900	900	900
R-squared (within)	0.722	0.042	0.740	0.728	0.114	0.798
Number of industries	100	100	100	100	100	100

Note: See Table 5.
Source: See Table 2.

Table 7. Dischronous Effects of the Quota Removal: Lag

	(1)	(2)	(3)	(4)	(5)	(6)
	lnQ	lnN	lnq	lnVA	lnL	lnlp
Tariff rates	-0.129	-0.278*	-0.135	-0.218**	0.090	-0.143
(year t-1)	(0.165)	(0.165)	(0.131)	(0.107)	(0.130)	(0.109)
Quota removal dummy	-0.023	0.052	-0.028	0.004	-0.027	0.080**
(year t-1)	(0.042)	(0.046)	(0.036)	(0.035)	(0.035)	(0.034)
Observations	900	900	900	900	900	900
R-squared (within)	0.728	0.025	0.762	0.732	0.053	0.818
Number of industries	100	100	100	100	100	100

Note: See Table 5.
Source: See Table 2.

Table 8. Effects of the Import Quota Removal on Growth

	(1)	(2)	(3)	(4)	(5)	(6)
	Growth rate (between t-1 and t)					
	lnQ	lnN	lnq	lnVA	lnL	lnIp
Tariff rates	-0.017	-0.035	-0.021	-0.039	0.023	-0.014
(year t-1)	(0.102)	(0.135)	(0.039)	(0.072)	(0.156)	(0.134)
Quota removal dummy	0.019	0.056**	0.017	0.000	0.019	0.039*
(year t-1)	(0.019)	(0.027)	(0.016)	(0.011)	(0.016)	(0.021)
Observations	900	900	900	900	900	900
R-squared (within)	0.086	0.059	0.099	0.076	0.070	0.069
Number of industries	100	100	100	100	100	100

Note: See Table 5.

Source: See Table 2.

Table 9. Differences between Earlier and Later Periods

	(1)	(2)	(3)	(4)	(5)	(6)
	lnQ	lnN	lnq	lnVA	lnL	lnIp
Tariff rates	-0.331	-0.464*	-0.294*	-0.277**	-0.055	-0.170
(year t)	(0.219)	(0.263)	(0.165)	(0.117)	(0.237)	(0.157)
Quota removal dummy	-0.045	0.002	-0.048	0.008	-0.053	0.050
(year t, before 1966)	(0.051)	(0.053)	(0.046)	(0.039)	(0.040)	(0.039)
Quota removal dummy	-0.059	-0.011	-0.170	-0.081	0.022	0.159
(year t, after 1966)	(0.231)	(0.200)	(0.153)	(0.115)	(0.129)	(0.114)
Observations	1,000	1,000	1,000	1,000	1,000	1,000
R-squared (within)	0.746	0.043	0.776	0.749	0.114	0.825
Number of industries	100	100	100	100	100	100

Note: See Table 5.

Source: See Table 2.

Table A1. Summary Statistics, by Year

year	Real output Q	Number of establishments N	Output per establishment q	Real value-added VA	Employment L	Labor productivity lp	Tariff rates tariff
1960	106,267	766	1,060	32,227	43,253	0.952	0.179
1961	130,730	799	1,180	40,123	47,048	1.048	0.186
1962	144,472	815	1,268	44,172	48,140	1.104	0.187
1963	157,450	797	1,473	51,174	49,499	1.267	0.196
1964	184,949	779	1,771	59,731	50,857	1.412	0.191
1965	195,859	818	1,797	61,691	50,631	1.501	0.191
1966	220,795	854	1,945	73,412	51,746	1.761	0.191
1967	258,833	849	2,400	89,935	52,025	2.150	0.191
1968	306,020	857	2,947	105,992	53,471	2.427	0.189
1969	362,546	883	3,303	128,128	55,210	2.863	0.162

Note: Average figures are reported.
Source: MITI (1960-1969).

Table A2. Correlation Matrix

	Real output Q	Number of establishments N	Output per establishment q	Real value-added VA	Employment L	Labor productivity lp	Tariff rate tariff	Quota removal dummy quota
Q	1							
N	0.178	1						
q	0.593	-0.187	1					
VA	0.885	0.191	0.443	1				
L	0.568	0.757	0.004	0.573	1			
lp	0.360	-0.305	0.436	0.426	-0.234	1		
tariff	0.058	-0.048	0.067	-0.007	-0.057	-0.031	1	
quota	0.184	0.158	0.030	0.234	0.213	0.091	-0.072	1

Source: MITI (1960-1969).

Table A3. OLS Results

	(1) lnQ	(2) lnN	(3) lnq	(4) lnVA	(5) lnL	(6) lnlp
Tariff rates	0.478***	0.268	0.416*	0.834*	-0.355	-0.148
(year t)	(0.183)	(0.195)	(0.235)	(0.428)	(0.410)	(0.162)
Quota removal dummy	0.388***	0.584***	0.408***	0.442***	-0.053	0.176***
(year t)	(0.049)	(0.054)	(0.053)	(0.095)	(0.105)	(0.045)
Observations	1,000	1,000	1,000	1,000	1,000	1,000
R-squared	0.056	0.104	0.056	0.022	0.001	0.016
Number of industries	100	100	100	100	100	100

Note: ***, **, and * indicate statistical significant at 1%, 5%, and 10% levels, respectively. Robust standard errors in parentheses. Year dummies are not included. Constant term is included but not reported.

Source: See Table 2.