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Tetsuji Okazaki (Meiji Gakuin University)*

Abstract

During World War II, the Japanese government carried out a large-scale mobilization of the labor force for war production. To move young and middle-aged men into the military and strategic industries where they were essential, the government restricted male employment in certain designated industries where female workers could substitute for male workers. Women were regarded as a major source of labor, in addition to men in "nonessential and nonurgent" industries and (male) students. Exploiting the variation in the regulation of male employment across industries, we conducted a simple regression analysis to investigate the impact of the war on the female labor force participation, using industry-level panel data from 1920 to 1970. We found that the female employment ratio in the industries where male employment was restricted increased relative to the other industries from 1940, and that this effect continued until 1970. This suggests that wartime labor mobilization had a positive impact on female labor participation, and that the impact was persistent. The case study on banks indicates that major banks indeed made efforts to substitute female for male employees, and that they changed the internal organization and rules of the banks to achieve this, which is one of the reasons for the persistence of the impact.

Key words: Female employment, Labor mobilization, War economy, Economic history, Japan

JEL classification numbers: J21, J68, N25, N35, N45

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1. Introduction

Female labor force participation and its historical origins have been attracting interests of economists (Goldin 1991, 2006; Acemoglu and Autor 2004; Alesina, Giuliano, and Nunn 2013). On the increase in the female labor force participation in the twentieth century United States, the impact of World War II is a focus. Given the two contrasting views, that is, the classical view that World War II was the "watershed event" for female labor force participation (Chafe 1972) and the revisionist view that the impact of World War II was not persistent (Anderson 1981; Campbell 1984; Milkman 1987), Goldin (1991), Goldin and Olivetti (2013) proposed a new integrated perspective. Although a large number of married women entered the labor market during the war, the majority of these female wartime entrants had exited by 1950, and in this sense, the impact of the war was not a direct one (Goldin 1991). At the same time, more highly educated women tended to remain in their jobs up to 1950 and beyond (Goldin and Olivetti 2013). Related study is Acemoglu and Autor (2004), which exploited the variation in female labor mobilization across states to find that the impact of female labor mobilization during World War II faded out overtime, but that greater female labor supply in high-mobilization states persists for at least 15 years after the war's end.

More recent studies on this issue are mixed in their conclusions. On the one hand, Rose (2018) exploited the special variation in the industrial mobilization of women to analyze the impact of the war on female labor force participation in the USA, and found that the effect of wartime work was marginal in 1950. On the other hand, Shatnawi and Fishback (2018) estimated the demand and supply curves of female labor using gender-specific industry-level data from Pennsylvania and found that the demand for female workers was substantially higher than not only the prewar level, but also than the counterfactual demand calculated based on the trend in the 1920s.

In this paper, we address the issue of the short-run and long-run impacts of World War II on female labor participation using data from Japan. Addressing this issue by focusing on Japan is advantageous in that we can exploit the variation in female labor force mobilization across industries. From the late 1930s, the Japanese government regulated employment of male workers to allocate them to strategically important industries, and in the 1940s explicitly restricted male employment in certain designated industries where female workers could substitute for male workers. Using this information, we estimate the impact of wartime mobilization on female labor force participation.

In the context of Japan, there are some studies directly related to this paper. Cohen (1949) and Nishinarita (1985, 1994) provide overviews of the policies for labor mobilization in wartime Japan, covering the issue of female labor mobilization. Shioda (1984, 1988) described the impact of the war on female labor in detail. We rely on these studies on the development of labor mobilization and labor policies, as well as official records such as from the Ministry of Labor (1961) and the Ohara Institute for Social

Research, Hosei University (1964). This paper integrates the detailed information in these works with quantitative data and a case study on the banking industry, to evaluate the short-run and long-run impacts of the war on female labor force participation.

The remainder of this paper is organized as follows. Section 2 describes labor force mobilization and labor controls in Japan during World War II, with a focus on the development of the Labor Mobilization Plan and the National Mobilization Plan. Section 3 investigates the industry-level panel data of the Population Census. By using data from 1920 to 1970, we consider the short-run and long-run impacts of wartime mobilization. As a case study, Section 4 describes the changes in female employment in the banking industry. Section 5 concludes.

2. Labor mobilization and labor controls during the war

The years 1936–1937 marked a major turning point for the Japanese economy. The military coup d'état in February 1936 strengthened the political power of the Army to remove restrictions on military expenditures. Furthermore, in July 1937, Japan started a full-scale war with China, the Second Sino–Japanese War. The expansion of the government budget caused inflation and a deficit in the balance of international payments, which reflected shortages in the supply capacity at the macro level. The government had no choice but to reduce expenditure in other areas following the increases in military expenditure, and it started to introduce direct economic controls from early 1937, such as the licensing of foreign exchange, restricting the flow of funds to "nonessential and nonurgent" industries, and the rationing of materials in shortage (Nakamura and Hara 1971; Hara 1998, 2013; Okazaki and Okuno-Fujiwara 1999; Okazaki 2023).

Direct labor market controls were not introduced immediately because Japan had basically had surplus labor since the nineteenth century. However, in April 1938, when it became clear that the Second Sino–Japanese War would be prolonged, the first controls were introduced. All municipal employment agencies were nationalized, while private employment agencies were prohibited. The aim of this reorganization was to incorporate the government's policies into employment placement, and indeed the nationalized employment agencies became an organizational basis for labor mobilization. At the same time, the National Mobilization Law (*Kokka Sodoin Ho*) was enacted in April 1938, which gave the government every authority to mobilize and control resources, and based on the National Mobilization Law, various ordinances and orders for controlling the labor market were subsequently implemented, as the war situation and other economic controls developed (Hara 1998, 2013).

The expansion of labor control was associated with the systematization of economic planning. Wartime economic planning was launched by the Material Mobilization Plan in January 1938, which provided the basis for rationing commodities from FY1939. A system of economic plans was then drawn up by the Planning Board and approved by

the Cabinet, including the Material Mobilization Plan, the Implementation Plan for Production Capacity Expansion, the Fund Control Plan, the International Trade Plan, and the Labor Mobilization Plan. In turn, this systematization coincided with the launch of the Four Years Plan for Production Capacity Expansion, which aimed to expand the production capacities of 15 munition and related industries, including iron and steel, coal, nonferrous light metal, petroleum and its substitutes, shipbuilding, and automobiles (Nakamura and Hara 1971; Hara 1998, 2013; Okazaki and Okuno-Fujiwara 1999; Okazaki and Okubo 2025).

In April 1939, regulation of employment and wage controls were introduced by the Employment Regulation Order (*Jugyosha Yatoiire Seigen-rei*) and the Wage Control Order (*Chingin Tosei-rei*), respectively. The Employment Regulation Order made interfirm transfer of employees of the designated industries subject to the approval of the employment agency. The Employment Regulation Order was replaced by the Employee Transfer Prevention Order (*Jugyosha Ido Boshi-rei*) in November 1940, and further replaced by the Labor Adjustment Order (*Romu Chosei-rei)* in December 1941. With the latter, all employment, dismissals, and work were subject to the approval of the employment agency. All of these orders were based on the National Mobilization Act, and the government used them to mobilize labor for the strategic industries (Ministry of Labor 1961; Ohara Institute for Social Research, Hosei University 1964; Nishinarita 1994).

The government's policies on labor mobilization and labor controls were expressed in the Labor Mobilization Plan for each fiscal year (from FY1943, the National Mobilization Plan). The Labor Mobilization Plan for each fiscal year addressed both the demand side and the supply side. The demand side of the plan indicated the new demand and replacement demand for workers by sector and by gender, whereas the supply side indicated the supply of workers to be matched with the demand by source and gender. Here, demand implies not just demand but rather allocation of workers given the constraint of labor supply. The Planning Board (*Kikaku-in*) formulated both sides of the plan simultaneously, taking account of labor force requests from each sector, as well as overall labor supply (Cohen 1949).

Tables 1 and 2 present the demand side and the supply side of the Labor Mobilization Plan and the National Mobilization Plan from FY1939 to FY1944[1]. The total demand for workers in the FY1939 Plan was 1,042,000, of which 667,000 were new demand and 375,000 were attrition replacement. The new demand for the Production Capacity Expansion Plan, military industries, export and essential goods industries, and transportation and communication industries comprised the major items. On the supply side, new graduates from elementary schools were the largest source, followed by

[1] PDF files of the original documents of the Labor Mobilization Plan and the National Mobilization Plan are available at the National Archives of Japan Digital Archive (https://www.digital.archives.go.jp/).

agricultural workers and nonagricultural workers. The reallocation of agricultural workers reflects the situation that there had been excess labor in the agricultural sector since the nineteenth century, and reallocation of nonagricultural workers reflects that some "nonessential and nonurgent" industries would be downsized as a result of economic controls and shortage of raw materials. By gender, 33.5% of the total labor supply was expected to be female (in parentheses in Panel C of Table 2).

Table 1
Table 2

The FY1940 Plan was similar to the FY1939 Plan, except for the increase in attrition replacement on the demand side. The female worker ratio was also almost the same; however, the FY1940 Plan stated:

> Regarding women's labor, active guidance shall be given in the choice of workplace, with particular emphasis on meeting the demand of industries that require female labor. Efforts shall be strengthened to encourage employment and promote voluntary labor service among unmarried women who are not currently employed. (author's translation)

Furthermore, the Plan highlighted the importance of the protection of women, in particular pregnant and postpartum women. As Shioda (1984) noted, during the war, the government consistently took into account the protection of motherhood and the preservation of the family system, which was consistent with the ideology of the emperor system.

The FY1941 Plan differed substantially from previous plans. First, the scale of mobilization was much larger. The reasons for this relate to the FY1941 Plan being decided in August 1941 when the Japanese Army was stationed in southern Indochina, and this caused a freeze of Japan's assets and imposition of an oil embargo by the USA. Hence, the FY1941 Plan was drawn up on the assumption that Japan and its sphere of influence in East Asia would be isolated from the rest of the world. On the demand side of the Plan, an increase in the demand for military equipment and a decrease in production in the export and essential goods industries reflected the political and military tension between Japan and the USA (Hara 1998).

The supply side of the FY1941 Plan is closely related to the Outline of the Emergency Measures for Labor (*Romu Kinkyu Taisaku Yoko*) decided by the Cabinet in August 1941, which stressed:

> Given the present tense situation, the mobilization of labor to address it is unprecedented in both scale and degree; therefore, it is truly necessary to organize

the entire nation and thereby strive for the fullest possible utilization of human resources. (Ministry of Labor 1961, p. 719; author's translation)

The Outline listed measures such as restricting worker exits from important plants, restricting worker entries to nonstrategic industries, reallocation of the labor force from industries that should be downsized, and expanding the national registration system to women. Panel A of Table 2 shows that one of the distinctive characteristics of the FY1941 Plan was the expectation of a large supply of workers from nonagricultural industries. This reflected the policy of reorganizing the industrial structure and thereby reallocating resources from "nonessential and nonurgent" industries to the strategically important industries. At the same time, reallocation of labor from agriculture was lower than in the plans for previous fiscal years. This occurred because the number of excess workers in agriculture was decreasing, and it was necessary to maintain the number of agricultural workers to ensure sufficient food production.

Despite the breakout of the Pacific War in December 1941, , the total scale of labor mobilization remained stable in FY1942 and FY1943; nor was there a substantial change in the composition of demand. On the supply side, however, there were some notable changes. First, the ratio of female workers increased gradually. Second, there was the emergence of two new sources of workers, namely male workers who were reassigned because of restrictions on male employment and students (currently enrolled students). The FY1942 Plan stressed mobilization of unmarried women, and the policy to substitute for male workers in clerical and civil service roles. The FY1943 Plan presented a policy to prohibit or restrict male employment in clerical and light commercial roles that could be filled by female workers, and mobilize male workers into other industries.

In September 1943, the employment of males aged 14–39 years was restricted or prohibited by the Labor Adjustment Order for 17 occupations, that is, simple clerical work, light commercial work, and entertainment/hospitality work, positions that could be filled by women or men aged 40 years or older. In addition, also in September 1943, the Women's Volunteer Corps (*Joshi Teishin-tai*) was organized. This comprised nominally volunteer groups organized on the basis of alumni associations or neighborhood associations to be dispatched to factories or establishments for 1–2 years to substitute for male workers (Ohara Institute for Social Research, Hosei University 1964, p. 16).

In late 1943, the unfavorable war situation for Japan became decisive. To cope with the situation, the Japanese government limited the focus of production efforts to the "Five Major Priority Industries," namely aircraft, shipbuilding, iron and steel, light nonferrous metals, and coal (Hara 1998). Concerning labor mobilization, the Cabinet enacted Emergency Nation Mobilization Measures in January 1944. For "the fullest mobilization of the nation's labor power," it stressed the mobilization of students enrolled in schools and women. For the latter, it stated: "Taking into consideration our nation's

family system, the characteristics of women, and the necessity of strengthening the national power, the labor mobilization of women shall be promoted and expanded" (Ministry of Labor 1961, p. 1089; author's translation). This statement indicates that although the government was still concerned with motherhood protection and the traditional Japanese family system, it nevertheless decided to further mobilize female labor to cope with the deteriorating war situation. In addition, the government decided the policy that the Women's Volunteer Corps should be expanded, and a standard female employment ratio should be set for each industry.

Although the Women's Volunteer Corps was nominally voluntary when first organized in September 1943 according to the Women's Volunteer Corps Labor Order (*Joshi Teishin-tai Kinro-rei*) approved in April 1944, local governments could in fact order women to participate and work in the Corps. In August 1944, the Cabinet set a standard female employment ratio for each of certain designated industries (Ministry of Labor 1961, p. 1112; Ohara Institute for Social Research, Hosei University 1964, p.16).

The FY1944 National Mobilization Plan was based on these changes in government policies. This Plan basically doubled the scale of mobilization compared with the previous fiscal year. New demand for military equipment and attrition replacement increased sharply. In FY1944, the Japanese government made every effort to maintain and increase production of the Five Major Priority Industries. Increases in allocation to the military industry in the National Mobilization Plan reflected this policy, while the increase in attrition replacement reflected the expansion of male conscription.

The largest source of labor supply in the FY1944 Plan was students (Panel A of Table 2). Facing limits to the sources exploited in previous plans, the government decided to mobilize students currently enrolled in universities, vocational schools, middle schools, and even elementary schools. Related to this, the FY1944 Plan depended heavily upon the supply of female workers. The ratio of female workers in the Plan for each fiscal year is reported in parentheses in Panel C of Table 2. The ratio began to increase from FY1942, and increased sharply in FY1944. This Plan stressed the policies and measures indicated in the Emergent Nation Mobilization Measures in January 1944, such as substitution of female workers for male workers by setting a standard female employment ratio, expansion of the Women's Volunteer Corps, and expanding the mobilization of enrolled students.

3. Mobilizing female labor I: Quantitative analyses

The series of plans and regulations outlined in Section 2 had a substantial impact on the employment structure in Japan. Table 3 compares the employment structure between 1930 and 1944. The data for 1930 are based on the Population Census for 1930, while the data for 1944 are based on the Summary of the Population Survey for 1944 (*Showa 19-nen Jinko Chosa Shukei Kekka Tekyo*; Bureau of Statistics, Office of the Prime Minister, Japan 1977), the population survey report released on February 22, 1944 by

the Statistics Bureau of the Cabinet. The survey covers all workers, except for those serving in Army and Navy units. As the industry-level employment data of the 1944 survey are for 14–61-year-olds, Arai (1986) complemented the data by assuming that the composition of employment for workers of 62 years or older was the same as that in 1940.

Table 3

Total employment increased from 29.3 million to 31.7 million, although the number of military personnel increased from 321,000 to 5,496,000 (Japan Statistical Association ed. 1988, pp. 527–528). At the same time, the composition by industry changed substantially. Whereas the share of primary industries and commercial sectors declined, the share of manufacturing industries increased. Within the manufacturing industries, the share of machinery and metal industries increased sharply, whereas that of textile and food industries declined sharply. The industries whose share declined are those from which labor was mobilized, and the industries whose share increased are those into which labor was mobilized.

The war also changed the composition of employment by gender. Whereas male employment declined slightly from 1930 to 1944, female employment increased 25% over the same period, that is, the ratio of female employment increased substantially. This change is notable because it occurred when agriculture and the textile industry, whose female employment ratio was high before the war, declined and heavy and chemical industries, whose female employment ratio was low before the war, expanded.

To examine the long-run impact of wartime labor mobilization on the gender structure of employment, it is essential to use long-term data with consistent industry classifications. Hence, we use the Comparison of Employed Persons by Industry in the Population Censuses (*Sangyo-betsu Shugyosha no Jukeiretsu Hikaku*; Bureau of Statistics, Office of the Prime Minister 1973), which reorganizes the Population Censuses for 1920, 1930, 1940, 1950, 1960, and 1970 to achieve consistent industry classifications. In addition, for 1944, we reorganize the Summary of the Population Survey for 1944 (*Showa 19-nen Jinko Chosa Shukei Kekka Tekyo*) so that the industry classification is consistent with the Bureau of Statistics, Office of the Prime Minister (1973)[2].

Combining the industry-level employment data of the Bureau of Statistics, Office of the Prime Minister (1973, 1977), we obtain 29 consistent industries. Thus, we have panel data of 29 industries × 7 years (1920, 1930, 1940, 1944, 1950, 1960, and 1970). Figure 1 shows the aggregate trends of employment. Consistent with Table 1, while male employment declined slightly from 1930 to 1944, female employment increased, and the

[2] As noted, the industry-level employment data of the 1944 survey do not include the data for people 61years or older. In the following analyses, we do not adjust it.

female employment ratio increased. Although the female employment ratio declined gradually from 1950, it was still substantially higher in 1970 than in 1930. In this respect, the change during the war was fairly persistent.

Panels A and B of Figure 2 illustrate the changes in the female employment ratio by industry. Panel A indicates that the change from 1930 to 1944 was indeed substantial. At the same time, the extent of the change differed across industries. While the increase in the female employment ratio was large for industries 10–25, it was modest for the other industries. The footnote to Figure 2 indicates that industries 10–21 are manufacturing, and industries 22–25 are commerce, finance, transportation, and communication. Panel B of Figure 2 compares the female ratios between 1944, 1960, and 1970. It is remarkable that the female ratio by industry did not change substantially from 1944 to 1970, indicating the persistence of the change during the war.

Figure 1

Figure 2

Exploiting the variation in the changes in the female employment ratio across industries during the war, we explore the mechanism of the changes. To do so, we use the regulation on male employment during the war. As described in Section 2, by the Labor Adjustment Order in September 1943, employment of males aged 14–39 years was restricted or prohibited for 17 occupations of simple clerical work, light commercial work, and entertainment/hospitality work that could be substituted by women or men aged 40 years or older The 17 occupations listed by this Order were: clerical assistant; casher; office attendant, janitor and receptionist; sales clerk; peddler; salesperson; payment collector; telephone operator; ticket clerk; train and bus conductor; railway crossing guard; elevator operator; house steward and solicitor; server; barber, hairdresser (Ministry of Labor 1961, pp. 1117–1118).

Furthermore, in August 1944, the Cabinet set the standard female employment ratio for each designated industry (Table 4). Based on this information, we identify the 11 industries out of 29 listed in the footnote to Figure 2 as the industries where male employment was restricted during the war (i.e., service industries, white-collar-intensive industries, and the industries whose lower bounds of female employment ratios were ≥50%): (12) rubber products, (13) leather products, (16) metal products, (18) electric machinery, (20) precision machinery, (22) commerce, (23) finance and insurance, (24) transportation and warehouse services, (27) private services, (28) medical and sanitary services, and (29) public services

Table 4

Using these data, we estimate the following simple equation:

$$\text{FemaleRatio}_{it} = \alpha + \beta i_t \, \text{Restrict}_i \times D_t + \gamma_i + \delta_t + \varepsilon_{it}, \quad (1)$$

where FemaleRatio_{it} is the female employment ratio of industry i in year t, and Restrict_i is a dummy variable that equals 1 if industry i is one of the above 11 industries where male employment was restricted during the war, and 0 otherwise. D_t is a year dummy, and γ_i and δ_t are industry fixed effects and year fixed effects, respectively. By this specification, we examine the change over time of the effect of male employment restrictions.

Basic statistics are shown in Table 5, and the estimation results are reported in Table 6. Column (1) of Table 6 presents the result when we regress FemaleRatio on only the industry fixed effects and year fixed effects. The reference year is 1920. Whereas the year fixed effect of 1930 is weakly negative, after that they are positive and statistically significant. The coefficient for 1944 is quite large, which indicates that the female employment ratio in 1944 was 12.41 percentage points higher than that in 1920 on average. While the coefficient declines for 1950, it is still larger than that for 1940. Furthermore, the coefficient increases again, and that for 1970 is as large as that for 1944.

Table 5

Table 6

Column (2) presents the estimation result of equation (1). The coefficient on the interaction term for each year compares changes in the female employment ratios from 1920 to each year, between the industries where male employment was restricted and the other industries, namely the difference in differences. While the coefficient on MaleRestriction × 1930 is positive, the magnitude is relatively small and its statistical significance is weak (10%). For 1940 and 1944, however, the coefficients on the interaction term are much larger and statistically significant. For 1950, the coefficient becomes smaller, but is still larger than that for 1940. Furthermore, for 1960 and 1970, the coefficients become larger, and the coefficient for 1940 is as large as that for 1944. Column (3) presents the results when we add the log of employment as a control. The results are qualitatively the same.

These results indicate that the extent of the increase in the female employment ratio during the war was larger for those industries where male employment was restricted than for the other industries, and the difference in the extent of the increase was persistent and became even larger after the war.

4. Mobilizing female labor II: The case of the banking industry

In Section 3, we found that during the war, the female employment ratio increased

substantially, in particular, in the industries where male employment was restricted, and that this change was persistent after the war. We now explore what happened within firms in those industries, focusing on the banking industry. According to the data from the Bureau of Statistics, Office of the Prime Minister (1973, 1977), the finance and insurance industry was a typical sector where the female employment ratio increased during the war. As shown in Figure 3, while the female employment ratio was stable at a level lower than 0.1 before the war, it increased sharply from 1940 to around 0.45 in 1944. During the war, while male employment declined, female employment increased substantially.

Figure 3

The official history of Sanwa Bank (Sanwa Bank 1954) provides detailed employment data. Sanwa Bank was established through consolidation of three major banks in Osaka (Sanjuyon Bank, Yamaguchi Bank, and Konoike Bank) in 1933, and was the largest bank in Japan in 1940 in terms of deposits. Table 6 shows the employment structure of Sanwa Bank. We can see that affiliated male employees declined from 1944. At the same time, military conscription and industrial conscription of male employees increased, and, consequently, the actual male workforce declined sharply. The actual male workforce ratio in July 1945 was only 61.0% of that in March 1941. Table 6 clearly indicates the substantial size of the impact of military and industrial conscription on male employment of a bank.

Table 7

Banking was a "growing industry" during the war. Banks played a major role in industrial finance, substituting for stagnating capital markets (Okazaki and Okuno-Fujiwara 1999). While bank loans became the major source of industrial funds, banks held large amounts of national bonds. To cope with a declining male workforce and growing workloads, Sanwa Bank increased female employment. As shown in Table 7, affiliated female employment continued to increase during the war. Although around 300 female employees were conscripted to industries, the actual number of female employees increased sharply as well. From March 1940 to July 1945, the female ratio in actual employees increased from 0.300 to 0.548. Concerning the bank's workforce during the war, Sanwa Bank (1954) stated:

> Originally, the financial business had been treated with special consideration in terms of labor, both as a vital sector on a par with key industries in the national emergency and as a sector requiring relatively high intellectual skills. However, as the war situation developed, the recruitment of new male employees gradually

became difficult, while repeated military and industrial conscriptions led to a marked decline in the number of men actually working. Particularly under the decisive battle regime after 1943, extraordinary measures such as restrictions and prohibitions on male employment in routine clerical work, and the expansion of the conscription system, were successively implemented. As a result, it became imperative to fundamentally transform the male-centered office management … Our bank, anticipating a shortage of male employees and under the principle of rationalizing management had from early on endeavored to recruit and employ female staff. In February 1937, a Committee for Office Improvement was established to promote the unification and rationalization of work procedures, while at the same time compiling the General Rules for Record-Keeping and the Outline of Office Work. These efforts also aimed, in part, at facilitating the clerical proficiency of female employees. (Sanwa Bank 1954, pp. 141–142, author's translation)

It is clear that both conscription of male employees and restrictions of male employment caused declines in male employment, and that to cope with this situation Sanwa Bank intentionally implemented a strategy to substitute female employees for male employees.

The situation was similar for Mitsubishi Bank, a major *zaibatsu* bank. Table 8 shows the affiliated employees of Mitsubishi Bank. There is a discontinuity in the data between March 1943 and September 1943 because Mitsubishi Bank merged with Daihyaku Bank in April 1943. From September 1943, the number of male employees declined continuously, while the number female employees increased substantially. The female ratio increased from 0.143 in September 1941 to 0.456 in August 1945[3]. As with Sanwa Bank (1954), Mitsubishi Bank (1954) also stressed the impact of the policies on male employment restriction from 1943, and the bank's countermeasure of recruiting female employees. Mitsubishi Bank established a new section in the Human Resources Department to recruit and instruct female employees (p. 361).

Table 8

For Sumitomo Bank, another major *zaibatsu* bank, long-term data on employment by gender are also available (Figure 4). Although it is not explicitly stated whether the data are for affiliated employees or the actual workforce, we can infer that the data refer

[3] Mitsubishi Bank (1954) stated that the 6,699 affiliated employees as of August 1945 included 2,598 male and female employees who had been previously conscripted into the Army, Navy, and strategic industries (pp. 360–361). We can infer that the number of conscripted male employees was much larger than the number of female employees, and that the female ratio in actual employees should be higher.

to affiliated employees[4]. It is impressive that prior to the breakout of the Second Sino–Japanese War, Sumitomo Bank employed no regular female employees except for typists and telephone operators. Following the outbreak of the war, however, it started to employ women commencing in 1937, and the female employment ratio increased sharply after that. The data include typists and telephone operators from 1941, but the number and ratio of female employees continued to increase after that. Figure 5 is also impressive in that the high female employment ratio remained in the postwar period.

Figure 4
Figure 5

One of the reasons for the persistency of female employment is arguably changes in the internal system of the bank. To recruit and maintain female employees, Sumitomo Bank established the Rules for Female Employment (*Joshi Shokuin Kitei*) in December 1939, which renamed female workers who had previously been employed under the title of "assistants" (*yatoi*) as "clerks" (*jimuin*), and renamed female "attendants" (*kuji*) as "apprentice clerks". At first, the mandatory retirement ages were 30 and 20 for female clerks and female apprentice clerks, respectively, but with revision of the rule in January 1944, the mandatory retirement ages became the same as those for the male clerks (Sumitomo Bank 1955, p. 251).

A similar change in the internal system was observed at Teikoku Bank, which was established through the merger of two major banks, Mitsui Bank and Daiichi Bank in March 1943. In June 1943, Teikoku Bank implemented a new job classification system with the positions of senior executive (*juyaku*), regular employee (*koin*), and hired employee (*yoin*). In this system, female clerks were classified as hired employees, but from December 1943, those who fulfilled certain criteria were promoted to regular employees (Mitsui Bank 1957, p. 521). These drastic changes for female workers in the banking industry had a substantial impact on their human resource management system.

5. Conclusion

During World War II, Japan experienced large-scale conscription of young and middle-aged men into the military. At the same time, it was faced with the need for rapid expansion of the war industry. To mobilize young and middle-aged men into the military and strategic industries, where they were essential, the government restricted male employment in certain designated industries where female workers could substitute for male workers. Women were one of the major sources of labor force mobilization besides

[4] In the main text, Sumitomo Bank (1955) states that female ratio increased to 0.6 in 1944 (pp. 250–251), but according to the data, it was 0.484 in 1944, which suggests that while the main text is based on the actual workforce, the data refer to affiliated employees.

men in “nonessential and nonurgent” industries and (male) students.

The Population Census data indicate that the aggregate ratio of female employment increased from 1930 to 1944, and that the extent of the increase varied across industries. Exploiting this variation, we conducted a simple regression analysis using industry-level panel data from 1920 to 1970 that regress the female employment ratio on the interaction of the dummy variable representing the industries where male employment was restricted during the war and the year dummies. We found that the coefficients of the interaction term became significantly positive from 1940, and the positive effect continued until 1970. These results suggest that the wartime labor mobilization had a positive impact on female labor participation, and that the impact was persistent. The case study on banks indicates that major banks indeed made efforts to substitute women for male employees, and that they changed their internal organization and rules of firms to achieve this, which are possible reasons for the persistence of the impact.

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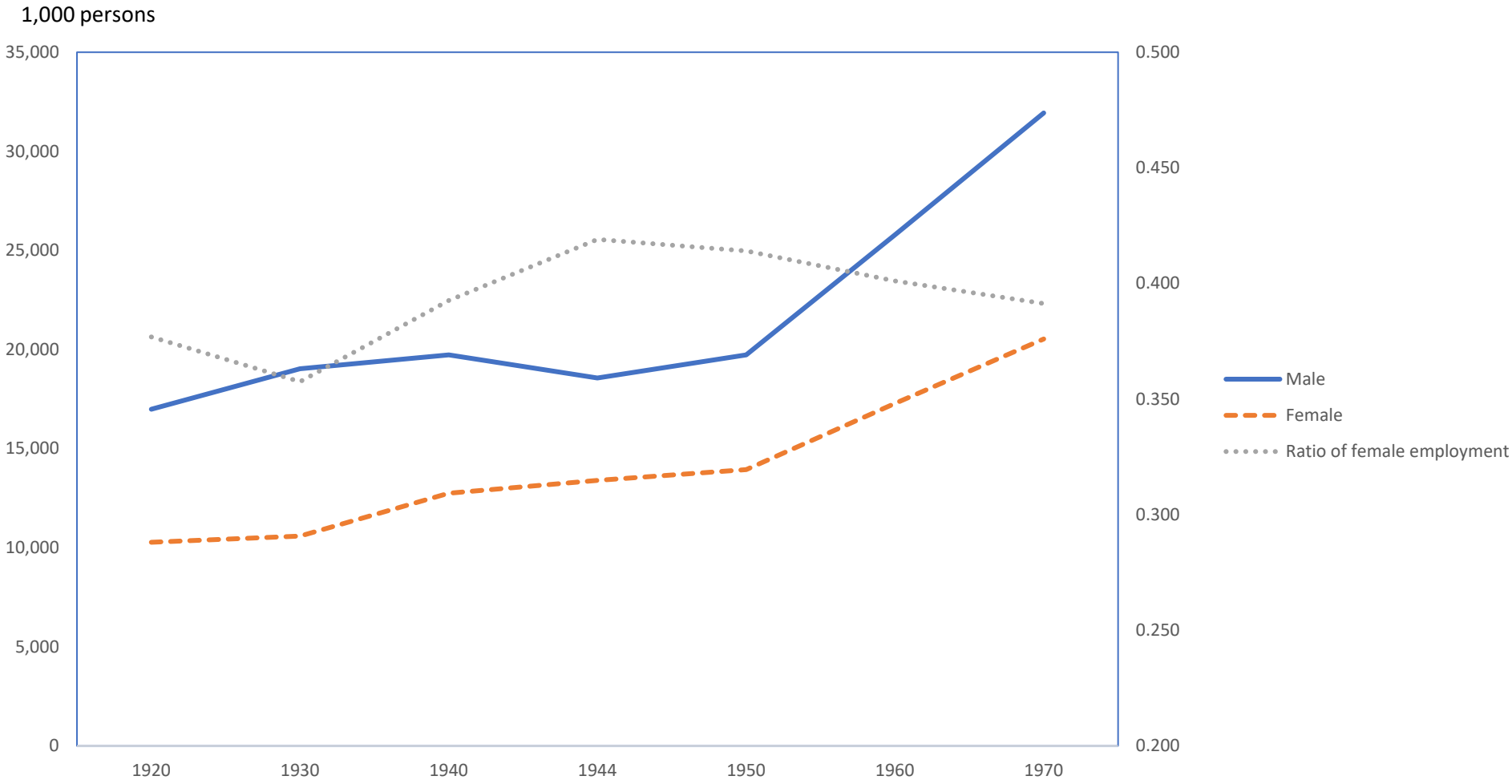
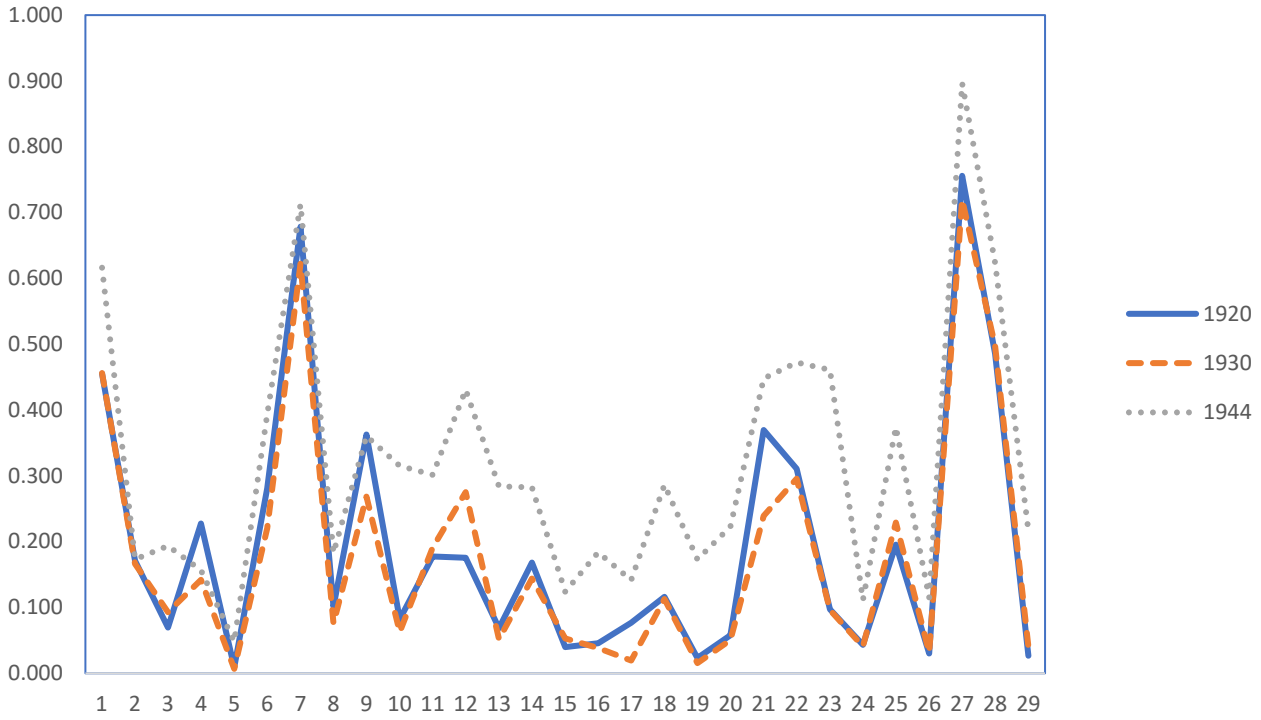
Figure 1 Evolution of employment by gender



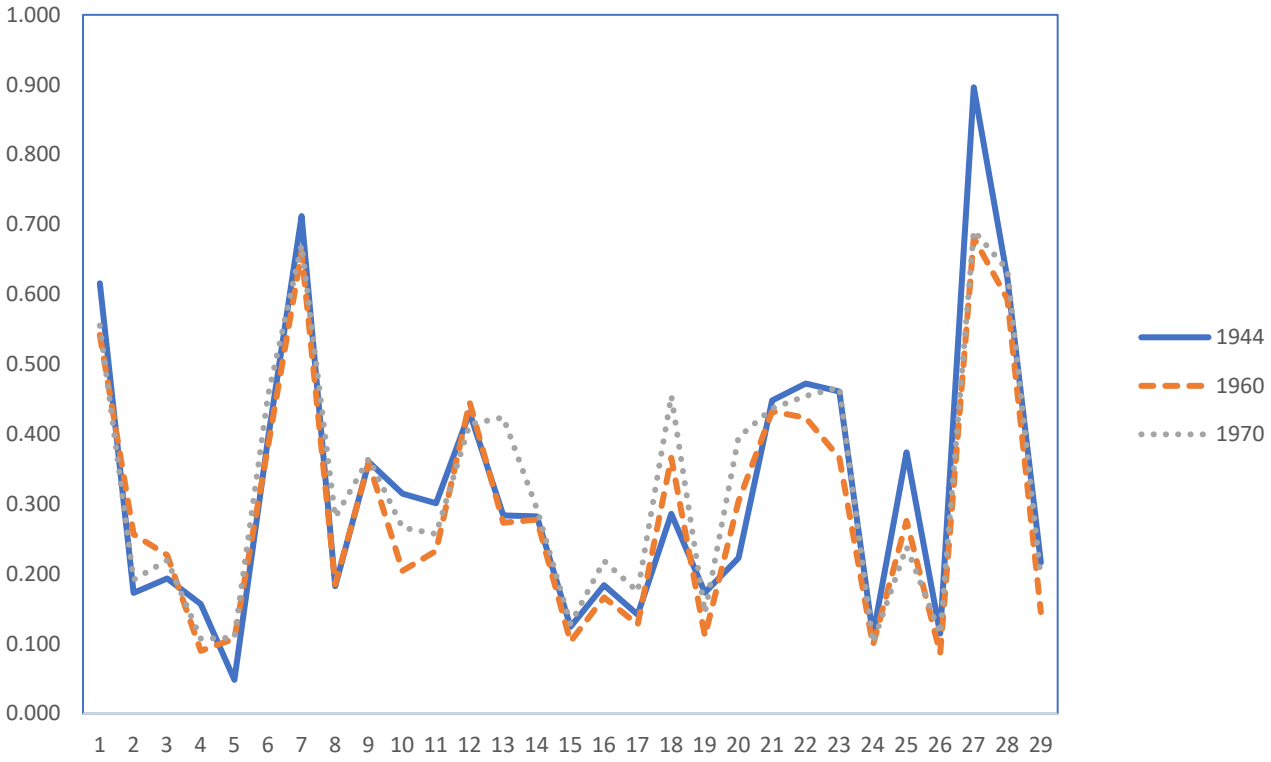
Source: Bureau of Statistics, Office of the Prime Minister (1973, 1977).
Note: The data for 1944 do not include the officers and soldiers of the Army and Navy.

Figure 2 Female employment ratio by industry

A. 1920, 1930, 1944



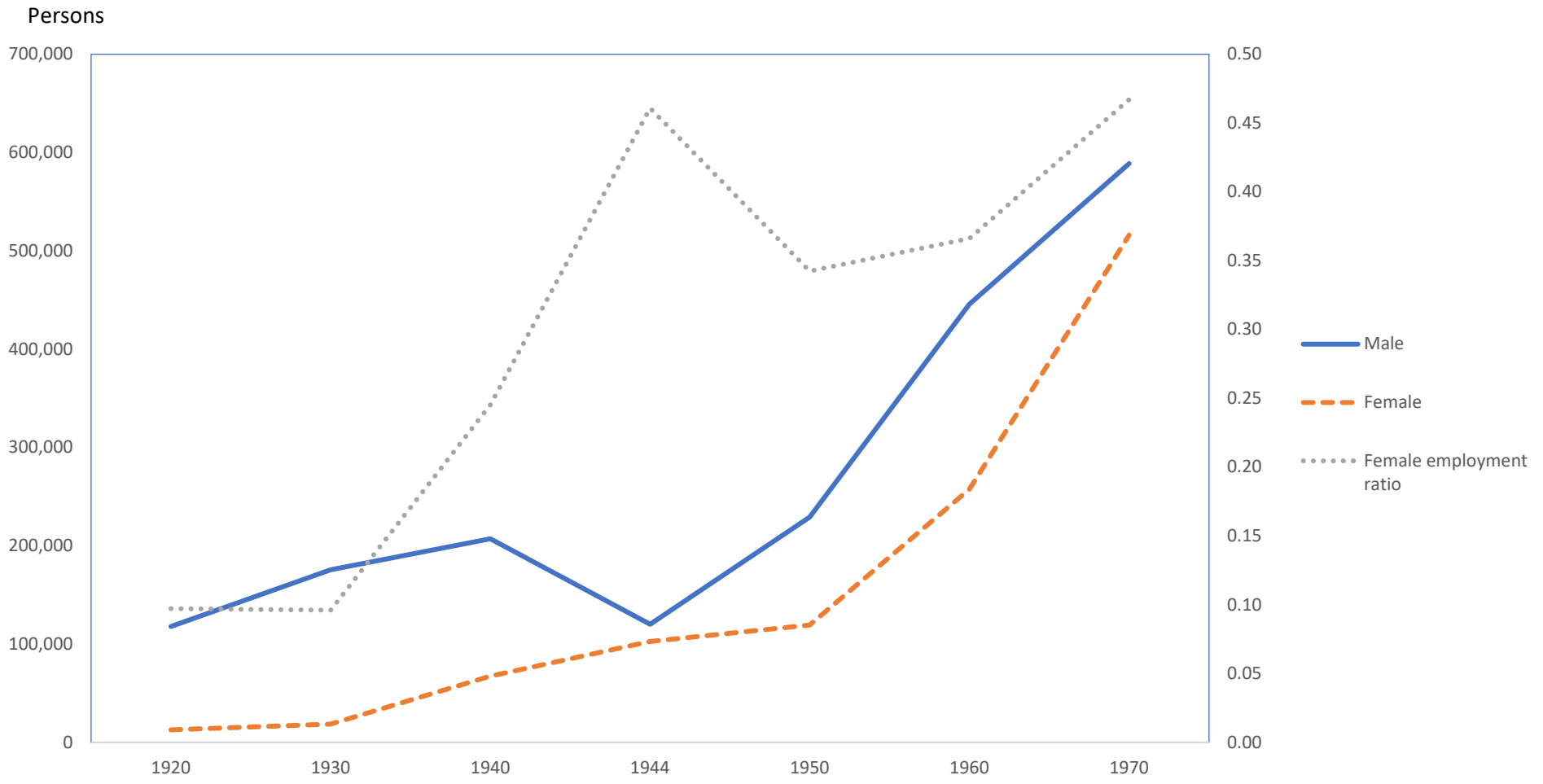
B. 1944, 1960, 1970



Note:

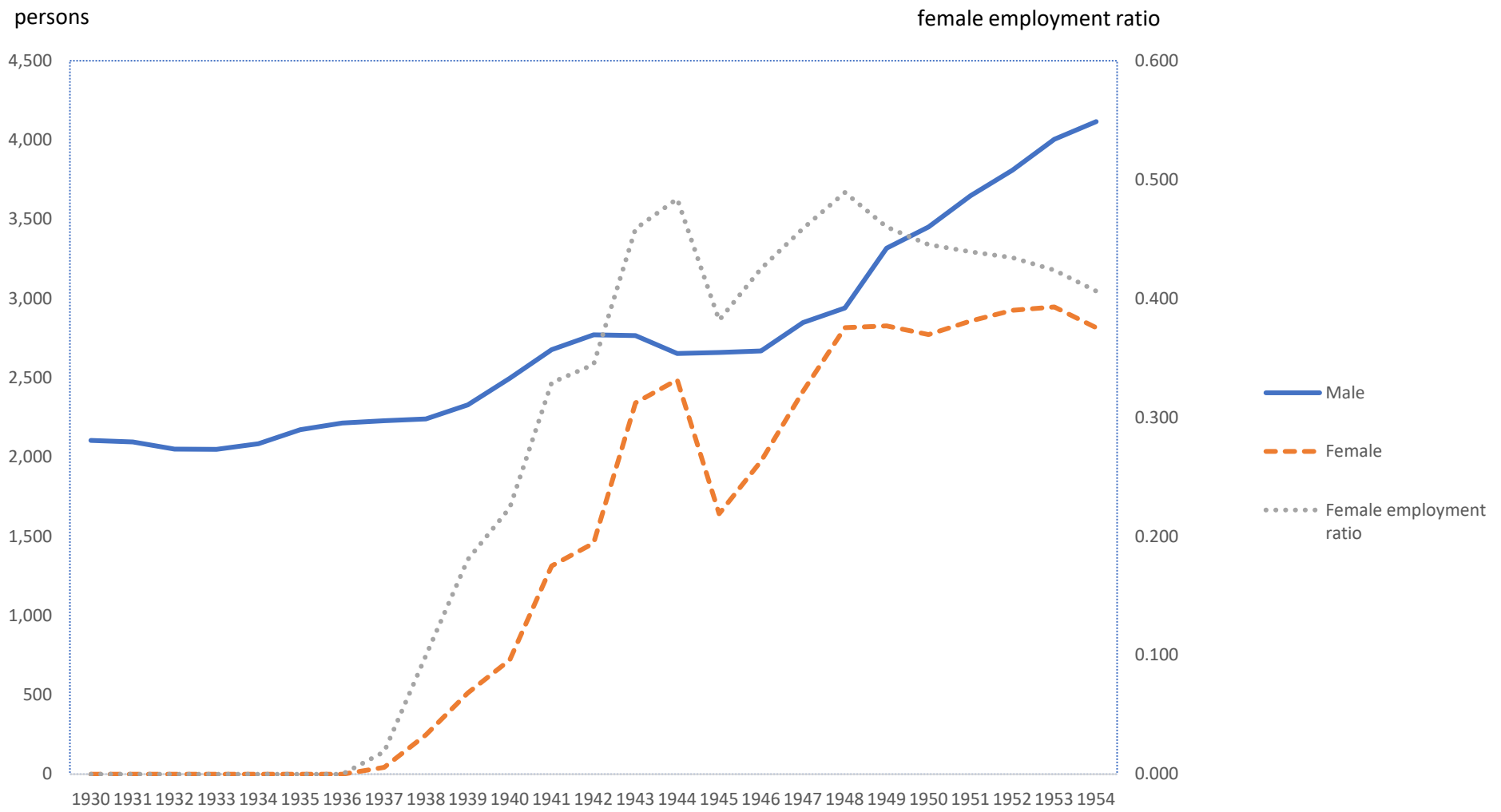
(1) agriculture
(2) forestry and hunting
(3) fishery
(4) mining
(5) construction
(6) food and tobacco
(7) textile and clothing
(8) lumber and wood products
(9) pulp, paper, and paper products
(10) printing and publishing
(11) chemical
(12) rubber products
(13) leather priducts
(14) ceramics, clay and stone products
(15) metal
(16) metal products
(17) general machinery and weapon
(18) electric machinery
(19) transportation machinery
(20) precision pachinery
(21) other manufacturing
(22) commerce
(23) fiannce and insurance
(24) transportation and warehouse
(25) communication
(26) electricity, gas, and water supply
(27) private service
(28) medical and sanitary services
(29) public services

Figure 3 Evolution of female employment ratio in the banking and insurance



Source: : Bureau of Statistics, Office of the Prime Minister (1973, 1977).

Figure 4 Employees of Sumitomo Bank



Source; Sumitomo Bank (1955), appendix, p. 23.

Table 1 Demand side of the Labor Mobilization Plan

1,000 persons

		1939	1940	1941	1942	1943	1944
Total		1,042	1,376	2,112	1,942	2,254	4,390
New demand	Total	667	691	1,283	1,055	1,159	1,958
	Military industry	161	258	850	506	588	1,393
	Industries for Production Capacity Expansion Plan	312	204	165	256	364	237
	Export and essential goods industries	95	97	4	18	7	15
	Transportation and communication industries	99	117	107	99	107	136
	Civil engeneering and construction industry	0	15	157	37	35	140
	Finance and Insurance indistry	0	0	0	9	0	0
	Agriculture, forestry and fishery	0	0	0	110	16	4
	Other industries	0	0	0	0	7	6
	Public sector	0	0	0	21	35	28
Attrition replacement		375	685	1,139	887	1,101	2,432

Source: Made by the author from "Labor Mobilization Plan" 1939-1942 FY; "Nation Mobilization Plan" 1943-1944 (downloadable from National Archives of Japan, Digital Archive).

Table 2 Supply side of the Labor Mobilization Plan

A. Total

1,000 persons

		1939	1940	1941	1942	1943	1944
Total		1,139	1,540	2,522	1,967	2,396	4,542
New school graduates	Elementary school	467	739	733	770	777	790
	Middle school	0	42	90	94	149	300
Students		0	0	0	0	53	2,053
Agricultural workers		256	202	0	98	83	38
Non-agricultural workers	Male workers who can be reassigned due to	0	0	0	0	190	241
	Others	194	382	1,449	795	719	430
Unemployed persons		137	87	169	90	255	270
Korean persons		85	88	81	120	170	290
Chinese persons		0	0	0	0	0	30
Patriotic Labor Service Corps		0	0	0	0	0	100

B. Male

1,000 persons

		1939	1940	1941	1942	1943	1944
Total		758	1,006	1,739	1,307	1,537	2,556
New school graduates	Elementary school	266	410	407	417	459	456
	Middle school	0	32	68	56	78	130
Students		0	0	0	0	35	1,133
Agricultural workers		191	122	0	84	60	24
Non-agricultural workers	Male workers who can be reassigned due to	0	0	0	0	190	241
	Others	152	319	1,138	601	490	172
Unemployed persons		64	35	45	29	55	30
Korean persons		85	88	81	120	170	290
Chinese persons		0	0	0	0	0	30
Patriotic Labor Service Corps		0	0	0	0	0	50

C. Female

1,000 persons

		1939	1940	1941	1942	1943	1944
Total	Total	381	534	783	661	860	1,986
		(33.5)	(34.7)	(31.0)	(33.6)	(35.6)	(43.7)
New school graduates	Elementary school	201	329	326	353	318	334
	Middle school	0	10	22	38	71	170
Students		0	0	0	0	18	920
Agricultural workers		65	80	0	14	23	14
Non-agricultural workers	Male workers who can be reassigned due to	0	0	0	0	0	0
	Others	42	63	311	194	230	258
Unemployed persons		73	52	124	61	200	240
Korean persons		0	0	0	0	0	0
Chinese persons		0	0	0	0	0	0
Patriotic Labor Service Corps		0	0	0	0	0	50

Note: Percentages of female workers in parentheses.
Source: See Table 1.

Table 3 Change in the employment structure during the war

	Employment (1,000 persons)			Percentage (%)			Male employment (1,000 persons)			Female employment (1,000 persons)		
	1930	1944	1930-1944	1930	1944	1930-1944	1930	1944	1930-1944	1930	1944	1930-1944
All Industries	29,317	31,698	2,381	100.0	100.0	0.0	18,737	18,447	△ 290	10,580	13,251	2,671
Agriculture, forestry and fishery	14,699	14,028	△ 671	50.1	44.3	△ 5.9	8,251	6,162	△ 2,089	6,449	7,866	1,417
Mining & Quarrying	315	787	472	1.1	2.5	1.4	271	665	394	45	122	77
Construction	995	1,075	80	3.4	3.4	△ 0.0	986	1,024	38	9	51	42
Manufacturing	4,733	8,088	3,355	16.1	25.5	9.4	3,274	5,922	2,648	1,458	2,166	708
Ceramics	178	225	47	0.6	0.7	0.1	150	163	13	28	62	34
Metal Industry	391	823	432	1.3	2.6	1.3	374	708	334	17	115	98
Machinery	515	4,311	3,796	1.8	13.6	11.8	497	3,524	3,027	18	787	769
Chemical	181	600	419	0.6	1.9	1.3	147	417	270	34	183	149
Textile	1,905	807	△ 1,098	6.5	2.5	△ 4.0	797	237	△ 560	1,108	570	△ 538
Food	570	358	△ 212	1.9	1.1	△ 0.8	434	221	△ 213	137	137	0
Printing	133	107	△ 26	0.5	0.3	△ 0.1	125	74	△ 51	8	33	25
Others	859	857	△ 2	2.9	2.7	△ 0.2	751	578	△ 173	108	279	171
Gas, electricity and water supply	122	154	32	0.4	0.5	0.1	119	136	17	4	18	14
Commerce	4,758	2,406	△ 2,352	16.2	7.6	△ 8.6	3,287	1,150	△ 2,137	1,471	1,256	△ 215
Finance	184	244	60	0.6	0.8	0.1	166	139	△ 27	18	105	87
Transportation and communication	1,159	1,611	452	4.0	5.1	1.1	1,071	1,347	276	87	264	177
Public service	474	1,145	671	1.6	3.6	2.0	449	899	450	25	246	221
Service	1,806	2,019	213	6.2	6.4	0.2	707	872	165	1,007	1,095	88
Others	71	141	70	0.2	0.4	0.2	64	79	15	7	62	55

Source: Caliculated based on the data by Arai(1986) and Umemura (1988).

Note: Persons serving in Army and Navy units are not included.

Table 4 Lower bound of female employment ratio (August 8, 1944)

			%
White collar workers			60
Blue collar workers	Metal industry	Light metal	30
		Spring	50
		Screw	50
	Machinery industry	Marine engine	30
		Electric machinery	40
		Telecommunication equipment	50
		Light bulb and vacuum tube	60
		Measuring instrument	30
		Electric wire	40
		Battery	50
		Machine tool	35
		Hand tool and measuring tool	40
		Industrial equipment	30
		Railway vehicle	25
		Automobile	25
		Steel ship	20
		Aircraft body	40
		Aircraft parts	40
		Aircraft engine	30
		Aircraft engine parts	45
		Propeller	35
		Optical instrument	50
		Guns and artillery, shells, and weapons	40
		Bearing	50
		Valve and cock	35
	Chemical industry	Phermaceuticals	60
		Industrial chemicals, days, and fertilizers	20
		Paints and pigments	30
		Explosives	50
		Animal and vegetable fats	25
		Rubber products	50
		Leather	20
		Leather products	50
		Photographic Film and dry plate	50
	Ceramic industry	Refractory brick	20
		Glass products	40
		Asbestos	40

Ministry of Labor (1961), pp.1119-1121.

Table 5 Basic statistics

	Obs	Mean	Std.dev.	Min	Max
FemaleRatio	203	0.255	0.188	0.007	0.896
MaleRestriction	203	0.345	0.477	0.000	1.000
ln(Worker)	203	13.028	1.252	9.967	16.595

Table 6 Regression results on the female employment ratio

Dependent variable: FemaleRatio	(1)		(2)		(3)	
1930	-0.0154 (0.0088)	*	-0.0268 (0.0117)	**	-0.0302 (0.0110)	**
1940	0.0402 (0.0126)	***	0.0173 (0.0146)		0.0036 (0.0160)	
1944	0.1241 (0.0176)	***	0.0885 (0.0189)	***	0.0775 (0.0203)	***
1950	0.0487 (0.0158)	***	0.0228 (0.0142)		0.0086 (0.0151)	
1960	0.0974 (0.0189)	***	0.0636 (0.0169)	***	0.0398 (0.0209)	*
1970	0.1297 (0.0241)	***	0.0829 (0.0198)	***	0.0563 (0.0231)	**
MaleRestriction×1930			0.0301 (0.0163)	*	0.0270 (0.0152)	*
MaleRestriction×1940			0.0605 (0.0227)	***	0.0561 (0.0212)	**
MaleRestriction×1944			0.0939 (0.0314)	***	0.0892 (0.0323)	***
MaleRestriction×1950			0.0681 (0.0334)	**	0.0638 (0.0305)	**
MaleRestriction×1960			0.0891 (0.0389)	**	0.0757 (0.0351)	**
MaleRestriction×1970			0.1233 (0.0492)	***	0.1008 0.0459)	**
ln(Worker)					0.0280 (0.0089)	***
# of Obs.	203		203		203	
R^2	0.951		0.951		0.954	
Industry fixed effects	Yes		Yes		Yes	

Note: Standard errors clustered at industry are in paretntheses.

*** Statistically significant at 1% level.

** Statistically significant at 5% level.

* Statistically significant at 10% level.

Table 7 Employees of Sanwa Bank

	Male				Female				Female ratio	
	Affiliation	Military conscription	Industrial conscription	Actual workforce	Affiliation	Military conscription	Industrial conscription	Actual workforce	Affiliation	Actual workforce
1937.3	4,695	18	0	4,677	962	0	0	962	0.170	0.171
1938.3	4,715	210	0	4,505	1,105	0	0	1,105	0.190	0.197
1939.3	4,665	319	0	4,346	1,392	0	0	1,392	0.230	0.243
1940.3	4,644	315	0	4,329	1,856	0	0	1,856	0.286	0.300
1941.3	4,649	262	0	4,387	2,150	0	0	2,150	0.316	0.329
1942.3	4,874	510	16	4,348	2,465	0	0	2,465	0.336	0.362
1943.3	4,963	619	65	4,279	2,697	0	0	2,697	0.352	0.387
1944.3	4,652	926	391	3,335	3,212	0	0	3,212	0.408	0.491
1945.3	4,429	1,360	383	2,636	3,312	0	300	3,012	0.428	0.533
1945.7	4,859	1,810	373	2,676	3,549	0	306	3,243	0.422	0.548

Source: Sanwa Bank (1954), p.142.

Table 8 Employees of Mitsubishi Bank

	Affiliation		
	Male	Female	Female ratio
1941.9	1,769	295	0.143
1942.3	1,834	367	0.167
1942.9	1,894	470	0.199
1943.3	1,937	614	0.241
1943.9	3,971	1,930	0.327
1944.3	3,452	2,700	0.439
1944.9	3,353	2,928	0.466
1945.3	3,210	2,890	0.474
1945.8	3,140	2,635	0.456

Source: Mitsubishi Bank (1954), p.361.