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A Review of COVID-19 Economic Research in Japan

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Abstract

This paper presents a review of recent economic research on the COVID-19 pandemic in Japan, specifically focusing on policy responses related to infection control, household consumption, labor markets, and firm behavior. Although infection rates were relatively mild and containment policies were less stringent, Japan faced significant economic disruptions because of strained medical capacity, delayed vaccine rollout, and weak policy coordination. Economists responded by developing near real-time analytical tools for policy forecasting and evaluation, such as epidemic-macroeconomic models and high-frequency data analyses. Studies show that voluntary behavioral changes reduced mobility effectively, whereas government programs, including universal cash transfers, the Go To Travel campaign, and business subsidies, had mixed effects, raising concerns about efficiency and inequality. Japan's experience illustrates the potential for academic contributions to integrate real-time data, interdisciplinary expertise, and transparent decision-making into future crisis responses.

Keywords: COVID-19, Japan, Containment Policy, Economic policy

1 Introduction

This article summarizes Japan's COVID-19 infection, economic damage, and government policies related to various topics, such as the medical system, consumption, labor, family, and firms.[1] Japan's situation was better in terms of both infection and economy. However, discussion remains about containment and economic policies, such as mild lockdowns, inflexible medical systems, generous economic support, accumulated government debt, and the Tokyo Olympic Games. After summarizing the policy responses and their

[1]This paper was originally prepared as a section of Kubota et al. (2025) and divided as the independent article. I thank Daisuke Fujii and Taisuke Nakata for their helpful comments, and Fei Gao, Yuki Nakamura, and Sho Yamada for great research assitance. The selection of citations partly depends on the Japanese Economic Association's COVID-19 literature database. (https://COVID19.jeaweb.org/). This work is financially supported by the JSPS KAKENHI Grant Number 22K13400 and JST PRESTO, Japan, Grant Number JPMJPR2364.

evaluations, this review article also emphasizes what economists could promptly provide academic research on and how they contributed to actual policy decisions during the COVID-19 pandemic periods. Notably, economists started to utilize new tools, such as big data from private companies and real-time forecasting models. The pandemic was also an academic exercise for economists regarding future economic and social crises.

This paper is organized as explained hereinafter. Section 2 presents a summary of the infection situation and containment policies, with particular emphasis on the economic damage which has been sustained in Japan. In this section, the author also highlights academic research on epidemic–macroeconomic models and their contributions to major policy decisions during the pandemic. Section 3 presents examination of economic reactions and policies related to consumption, labor markets, and households, with particular emphasis on the evaluation of consumption stimulus measures and on the reshaping of work and lifestyle patterns. Section 4 gives a review of firm behavior and government support programs. The literature presents discussion of the benefits and shortcomings of generous business assistance, with particular attention devoted to its potential to weaken Schumpeterian-style cleansing mechanisms. Section 5 concludes the paper and presents discussion of lessons for future crises.

2 Infection and Lockdowns

Similarly to other countries, Japan experienced several waves of COVID-19. During the first wave of spring 2020, the infection was quite mild: only 15,156 cases (120 cases per million people) were reported, with 2190 severe cases and 136 deaths. The Japanese government implemented a partial lock down, a so-called state of emergency, which caused an approximately 10% decline in real GDP in the second quarter of 2020. This emergency declaration was later repeated in January, April, and July 2021 in response to subsequent waves (grey-shaded areas in Figure 1). In 2022, the government ended its emergency status, although the infection had spread substantially. This is because, as shown in the top panel of Figure 1, the number of patients in critical condition was limited compared to the previous waves. Overall, Japan was more successful in avoiding the harmful effects of the pandemic.

However, the results are paradoxical. First, the low infection rate and high economic costs appear to imply that Japan imposed a severe and efficient containment policy. However, Japan's declaration of a state of emergency was mild, being simply a *request*, and interpreted as a *voluntary* lockdown (Watanabe and Yabu, 2021a,b). Almost no legal penalty was applicable for going outside during this emergency. This situation also differs from the efficient Trace-Test-Quarantine (TTQ) strategies conducted in South Korea and Taiwan because of the insufficient supply of PCR tests.[2]

[2]As of May 31 2020, 2.16 people out of a population of 1000 took PCR tests in Japan, while the numbers were 17.55 in South Korea, 49.63 in the UK, and 57.16 in the US.

Interestingly, this simple request policy was sufficiently powerful. The mobility index presented in the bottom panel of Figure 1 dropped considerably in response to the state of emergency. Watanabe and Yabu (2021a,b) argue that rather than direct intervention, the information people infer from government announcements matters more, using regional timing differences in policies. Similarly, Rui et al. (2022) reported that newspaper coverage stimulated the purchase of masks. The importance of voluntary behaviors has also been emphasized by epidemic-macroeconomic model simulations (Hosono, 2021; Kubota, 2021). Japan's request-based policy may also work well for cultural reasons. Fujii et al. (2023) found that Japanese people revealed a preference for health over the economy from a cross-country comparison of pandemic frontiers. Kuroda et al. (2022) emphasized the role of social capital in preventing behaviors.[3]

Epidemic-Macro models and policy decisions Epidemic – macroeconomic models played a crucially important role in informing policy decisions in Japan: with Fujii and Nakata (2021) conducting the most influential and widely-cited study. Their Susceptible-Infected-Recovered (SIR) model featured a deliberately simple structure based on standard infection dynamics, incorporating the assumption that infection rates respond to economic variables. This streamlined approach enabled the model to integrate detailed real-time data and policy scenarios, consequently providing practical and timely answers to pressing policy questions. The authors organized weekly press conferences that garnered considerable attention from both the general public and government officials. Notably, in January 2021, their model predictions suggested that extending the state of emergency could prevent future repeated lockdowns while simultaneously improving both health and economic outcomes. The authors presented their analyses successfully to public health advisors and key policymakers, including Japan's prime minister, thereby directly influencing government decisions related to the timing of emergency declarations and their subsequent lifting. The model was also employed to project the potential effects of the Tokyo Olympic Games on infection dynamics, as summarized by Chiba et al. (2022). Their projections indicated that, whereas foreign visitors would have minimal direct impact on infection rates, the increased domestic mobility of Japanese residents associated with Olympic activities could prove substantial. Similar simple SIR modeling approaches have been adopted and extended by Shibata and Kosaka (2021), Beppu et al. (2023), Fukao and Shioji (2021), and Inoue and Okimoto (2023).

Beyond these simplified approaches, researchers have also developed more sophisticated macroeconomic models that incorporate dynamic general equilibrium features. Eichenbaum et al. (2021) extended the standard SIR model to include economic decision-making and to derive infection rates as an equilibrium outcome. Following this pioneering approach, Kubota (2021) and Hosono (2021) developed similar models tailored for

`https://ourworldindata.org/coronavirus-testing`

[3]However, these factors are still too small to explain the low infection rates in Japan and other Asian countries. People argue about a biological reason so-called *Factor X*. The BCG vaccination was a candidate, but economists Fukui et al. (2020) deny it by regression discontinuity design of generations. Some genetic factors are possible (Fujii et al., 2022), but Factor X is still hidden.

Japan, emphasizing people's endogenous economic reactions to the voluntary lockdown measures. From an engineering perspective, Chiba (2021a) and Chiba (2021b) applied agent-based modeling frameworks to various policy applications. Time-series econometric studies (Tomura, 2022; Shibamoto et al., 2022) have also proven valuable for empirical validation. However, these national-level simulations raise endogeneity concerns that complicate causal inference. To address this limitation, Hoshi et al. (2021) innovatively combined SIR simulation models with regional difference-in-difference (DID) estimation techniques to mitigate endogeneity problems. Another particularly unique and insightful contribution is that of Hirokawa et al. (2023), which evaluates a regional government's certification policy for food service providers implementing infection prevention measures, finding positive effects on both infection reduction and business sales performance.

Medical issues Japanese hospitals struggled to accommodate COVID-19 patients, as in other countries, but this is puzzling given the low infection rate. Part of the reason for the difficulties was the scarce supply of intensive care beds, although Japan has the largest number of beds per person among OECD countries. Moreover, Japan has allocated only a few intensive care beds for COVID-19 patients.[4] Economists have criticized the ignorance of economic incentives in medical systems. Like the voluntary lockdown, the Japanese government only provided guidelines for hospitals; that is, hospitals were free to reject COVID-19 patients. Takaku and Yokoyama (2022) found that the acceptance of COVID-19 patients imposed considerable financial burdens on hospitals through a decline in other patient visits.

In contrast, Japan succeeded in increasing vaccine intake by more than 80%, although its introduction was delayed. For an efficient distribution, Wang et al. (2022) and Kuniya et al. (2024) considered optimal vaccine allocation policies using age-dependent SIR models. The University of Tokyo Market Design Center provides vaccine distribution consulting services for local governments based on matching theory. Moreover, Sasaki et al. (2022) experimented with nudge-based messages to increase the intention to receive the COVID-19 vaccine; however, the effects were limited, similar to findings on infection-prevention behaviours (Sasaki et al., 2021; Kurokawa et al., 2025).

The mental health consequences of COVID-19 were considerable. Yamamura and Tsutsui (2022) use panel data to demonstrate that repeated states of emergency worsened psychological well-being by increasing anxiety and reducing social interaction. Batista et al. (2022) link the pandemic to troubling increases in suicide rates, especially among younger generations and women. Yamamura et al. (2023) explore gender differences in the mental health effects of vaccination, demonstrating that men and women perceived health risks differently, with implications for well-being and vaccine acceptance. Finally, Takaku et al. (2024) examine children and adolescents, demonstrating that prolonged school restrictions greatly harmed their

[4]According to OECD (2020), Japan had 5.2 intensive care beds per 100,000 people, compared to the OECD average of 12.0. In Japan, as of May 2020, 2356 intensive care beds were prepared for COVID-19 patients (according to the Ministry of Health, Labor and Welfare) out of 7109 total (according to the Japanese Society of Intensive Care Medicine). By contrast, Berger et al. (2022) report 925 out of 1242 in Denmark, 1900 out of 2400 in the Netherlands, and 925 out of 1200 in Norway.

mental health and social development.

3 Economic reactions and policies

Next, the economic reactions to the pandemic in terms of consumption, jobs, families, and firms are specifically examined. Unlike the mild spread of the infection and voluntary lockdowns, the economic reactions were substantial and comparable to those of other countries. The government provided generous economic support, with measures for which efficiency subsequently led to key policy debates.[5]

Consumption Trend Figure 2 shows an 11% decrease in total consumption and a 15% decrease in service consumption in the second quarter of 2020. Subsequently, these economic figures gradually returned to their earlier quantities. Given rapid and short-term changes in economic conditions, alternative data reported by private companies have gained attention as faster economic measures than public data. Watanabe (2020) was the first study to appear surprisingly early in late March 2020. This study shows a large decline in service consumption using credit card records and an increase in stockpiling consumption in supermarket sales from point-of-sale (POS) data. The Ministry of Economy, Trade, and Industry (METI) reported real-time sales indices using POS data for various items. Using raw data, Konishi et al. (2021) reported dramatic sales changes in detailed item categories such as masks and web cameras. On the household side, Kikuchi et al. (2023) studied age differences in consumption swings using home scanner data. A few studies have focused on the persistence of this change in consumption patterns. Watanabe and Omori (2021) suggest that this change is temporary because the online shopping shift did not expand to inexperienced consumers. However, Nakajima et al. (2022) found that consumers who newly started online shopping continued to make online purchases. These two studies examined consumer-side data, whereas Inoue and Todo (2023) studied online shopping site data and found that sales reverted to the old trend after the state of emergency.

Consumption stimulus One of the hottest policy topics during the pandemic was the Special Cash Payment (SCP) program. During summer 2020, the government transferred a fixed and sizable amount of cash (100,000 Japanese Yen, or approximately US 950 dollars in 2020) to every individual in Japan regardless of age, income, family size, or employment. Interestingly, the timing of bank transfers was delayed unexpectedly and randomly because of undercapacity at local offices, which allows natural experimental design for policy evaluations.[6] Kubota et al. (2021) analyse 2.8 million personal bank accounts data and find that 31% of transfers were withdrawn as cash. Kaneda et al. (2021) used financial management application data and reported slightly lower consumption responses. Many critics suggest the targeting transfers depending on

[5] Ando et al. (2020) summarize the Japanese government's fiscal policies during the early stage of the COVID-19 pandemic.

[6] There still remains an endogeneity problem. Bessho (2023) shows that the speed of payment process depends on mayor's characteristics.

labor income instead of universal transfers. However, these studies find negligible differences conditional on labor income. Instead, both studies find that liquidity constraints play a critically important role. Hattori et al. (2021) followed the same identification strategy using regional-level public data. Ueda (2023a) and Ueda (2023b) extend Kubota et al. (2021)'s study on bank account data. Furthermore, Kuroda and Onishi (2023) used the same bank account data to capture the financial conditions of food delivery gig workers, whose services became popular during COVID-19.

Another arguable economic stimulus policy is the Go to Travel campaign, which was implemented between July – December 2020. To recover the hugely damaged tourism industry, the government subsidized 35% of travel expenditure and distributed vouchers to 15% of purchases at the travel destinations. Indeed, great concern arose about the spread of COVID-19 through activated travel. This campaign excluded Tokyo because of its high risk of infection, and allowed researchers to use DID approaches for policy evaluation. Matsuura and Saito (2022) found a substantial increase in the number of overnight hotel stays and their (gross) prices, whereas Funashima and Hiraga (2023) suggested similar effects on hotel guests. Tamura et al. (2022) compared the areas inside and outside the Tokyo border and found a significant but short-term increase in the number of COVID-19 cases.

Labor market and family The Japanese labour market remained relatively stable. The unemployment rate was 2.5% in January 2020 and hit its highest rate of 3.3% in October 2020. As the middle panel of Figure 2 shows, the total employment remained almost unchanged, perhaps partly because of the Japanese labor law's protection of workers. Inaba and Matsuo (2023) emphasized the effects of the Employment Adjustment Subsidy (EAS). To allow firms to offer official leave to workers rather than lay them off, the government covered approximately 80% of the leave payments for small and medium-sized enterprises (SMEs).

Nevertheless, these policies failed to help the most affected people in Japan: part-time and non-tenured workers, so-called contingent workers. This issue was also associated with She-Cession, because these contingent workers tended to be low-income women employed in the service industry. As Figure 2 shows, the employment of low-educated women dropped substantially and never returned. Kikuchi et al. (2020) conducted relatively early study appeared in April 2020, estimating the concentration of damage to specific workers inferred from the consumption drop observed in credit card data. Kikuchi et al. (2021) explored these implications of using a public labor force survey and a structural model. Fukai et al. (2021) report individual-level differences in employment loss by industry, occupation, age, and sex. Kotera and Schmittmann (2022) conduct a panel survey of a human resource management companies and suggest that She-Cession effects were mainly attributed to industry differences. Fukai et al. (2023) found a larger decline in employment among married women with children, possibly because of the childcare responsibilities placed on mothers.

The availability of teleworking or working from home (WFH) played a crucial role in shaping resilience

to pandemic shocks in Japan. Kawaguchi and Motegi (2021) show that high-income and highly educated workers, especially those engaged in nonroutine cognitive tasks, were significantly more likely to transition to remote work, whereas employees in routine or manual occupations had limited flexibility. Similarly, Okubo (2022) emphasizes that the adoption of WFH was uneven across industries, and was strongly associated with digitizable job functions and firm-level practices. The effectiveness of telework, however, raises concerns about productivity. Using survey data from four manufacturing firms, Kitagawa et al. (2021) find that employees reported lower productivity levels compared to in-office work, although they benefited from reduced commuting stress and some improvements in well-being. Consistent with this, Morikawa (2022, 2023) document that WFH productivity was on average, 20–30% lower than standard office work, with persistent gaps in collaborative and creative tasks despite gradual adaptation over time. From a business perspective, Kawaguchi et al. (2022) demonstrate that firms implementing telework more actively were better able to mitigate sales losses, highlighting its role as a buffer during economic shocks.

The effects of WFH on personal and family life were more nuanced. Hara and Kawaguchi (2022) find that men working remotely became more engaged in housework and childcare, and Inoue et al. (2023a) further document that WFH encouraged husbands to adopt more family-oriented behaviors, spending more time with their children and supporting domestic responsibilities. By contrast, Sugano (2025) show that working mothers did not share these benefits. Instead, they often faced additional childcare and household burdens, which heightened stress and work – family conflict. Remote work also reshaped household dynamics in positive ways.

Family dynamics were also heavily affected by the pandemic. Komura and Ogawa (2022) examine marriage and divorce in Japan and find evidence of heightened marital instability, with rising divorce risks linked to economic stress and prolonged domestic confinement. At the same time, some households adapted with strengthened bonds as they reorganized family roles. Sugawara and Nakamura (2021) highlight that women disproportionately carried the burdens of long-term care for elderly relatives, which reduced their marketable labor supply and reinforced gendered divisions of household responsibilities.

Education In the education domain, several studies have shown that even relatively short school closures resulted in persistent learning losses. Takaku and Yokoyama (2021) provide evidence from regression discontinuity analysis that temporary closures reduced student achievement significantly, particularly among disadvantaged children. Similarly, Ikeda and Yamaguchi (2021) investigate the effectiveness of online learning during closures and highlight the importance of household resources and digital access in shaping learning outcomes. Asakawa and Ohtake (2021) focus on elementary school students and document declines in test performance, suggesting that early education was especially vulnerable. More recently, Nishihata and Kobayashi (2024) emphasize that prolonged reliance on digital tools increased disparities in both learning

progress and screen time, raising concerns about long-term educational inequality.

4 Firms

At the beginning of the pandemic, economists were concerned about the damage to firm activities. Miyakawa et al. (2021) predicted substantial firm exits during the early period of the pandemic based on a model estimated using pre-pandemic data. However, the number of bankruptcies decreased during the pandemic, as shown in the lower panel of Figure 2. By contrast, the number of closures and dissolutions, interpreted as voluntary exits, increased. This is possibly due to the substantially expanded business support. In addition to EAS, the government provided direct grants (Business Continuity (BC) Grants) and partial reimbursement for Office Rent (Office Rent (OR) Grant) for small and medium-sized enterprises whose sales had significantly declined. Furthermore, the government initiated zero-interest zero-collateral loans provided directly by public financial institutions and indirectly through subsidies to private banks and credit unions. This benevolent support might help rescue unfortunate and potentially productive businesses. However, it might also support unproductive firms (so-called zombies), which should exit otherwise.

Kawaguchi et al. (2021) conducted one of the earliest studies on the effects of COVID-19 on Japanese firms. Using a unique survey of firm managers conducted in the early stage of the pandemic, they documented substantial sales damage caused by both the spread of the virus and containment measures such as voluntary lockdowns. Beyond quantifying immediate losses, their survey also collected managers' subjective expectations about business performance. Importantly, they showed that receiving Business Continuity (BC) Grants improved the perceived probability of survival, suggesting that subsidies helped to stabilize expectations and reduce uncertainty in the business sector. Subsequent research, however, raised concerns about the longer-term implications of such support for resource allocation and productivity. For example, Hoshi et al. (2023) demonstrated that government support disproportionately went to firms with low pre-pandemic performance, thereby weakening Schumpeterian-style cleansing mechanisms that usually reallocate resources from less to more productive firms. Similarly, Honda et al. (2023) investigated the determinants and effects of support program usage and found that, although subsidies were indeed targeted toward severely damaged companies, these firms often used the funds primarily to accumulate cash holdings rather than to invest in productivity-enhancing activities. As a result, their profit performance actually worsened. In line with this evidence, Hong et al. (2022) identified a sharp increase in the share of zombie firms in 2020, pointing to the risk that overly generous support might have served to sustain unproductive businesses.

The interpretation of these findings, however, requires caution. As Chen et al. (2021), Morita and Ono (2024), and Saxegaard et al. (2022) argue, the pandemic created an environment of exceptionally high uncertainty and volatility in expectations, which likely motivated precautionary cash savings and risk-averse

strategies. In this context, the accumulation of liquidity by firms can be regarded as a rational buffer against future shocks, rather than as a sign of inefficiency. Moreover, rapid and massive government support might have played an important role in preventing systemic contagion through supply chain networks. The importance of business networks during COVID-19 was emphasized first by Inoue and Todo (2020), who simulated how a lockdown in Tokyo could propagate through interregional production linkages to affect firms nationwide. Their work highlighted how localized shocks could cascade through supplier – buyer relations, thereby amplifying the economic damage. Building on this early work, Inoue et al. (2021) provided evidence that such spillovers indeed occurred across industries, whereas Inoue et al. (2023b) advanced supply-chain simulations to evaluate alternative lockdown policies and containment strategies. Arata and Miyakawa (2024) also conducted this line of research by analyzing demand-shock propagation across input – output linkages, further illustrating the critical role of network structures in shaping the heterogeneous effects of the pandemic across sectors and regions.

5 Conclusion

The COVID-19 era was a historically rare period during which governments directly applied scientific evidence for important policy decisions. In Japan, the Subcommittee on Novel Coronavirus Disease Control, a counterpart to the Scientific Advisory Group for Emergencies (SAGE) in the UK, played a fundamentally important role in policy decisions. The subcommittee succeeded in providing scientific evidence for containment policies. However, members struggled to communicate with the government and to participate in the policymaking process. Furthermore, the pandemic has revealed underlying difficulties in interdisciplinary cooperation. The subcommittee consisted of 16 members, mainly medical experts. However, two of them were economists. Economic analyses tend to examine costs and benefits particularly, for example, by using a statistical valuation of life. However, these concepts are rarely accepted by medical experts. To prepare for a future pandemic, economists must reconsider how to integrate real-time scientific evidence into the political decision process and to reach agreements on value judgments, such as health versus economy.

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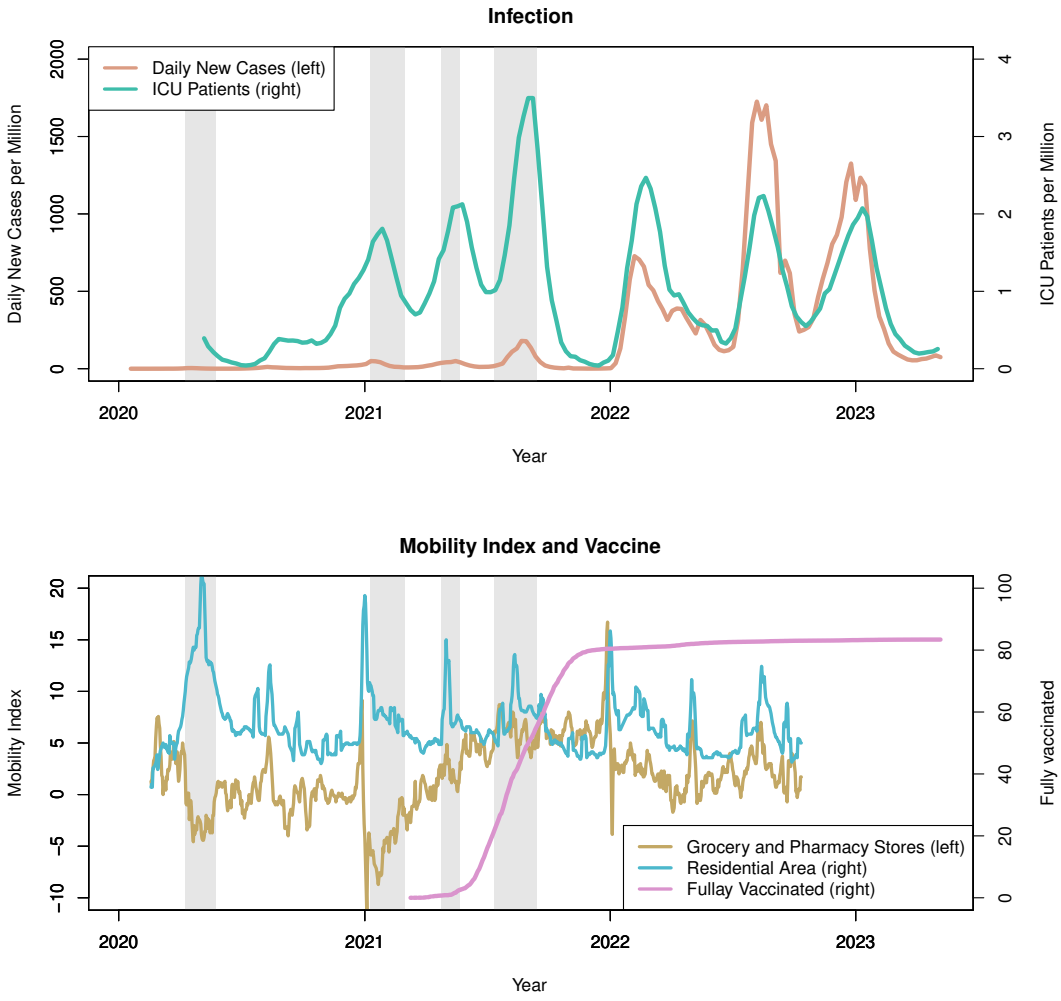
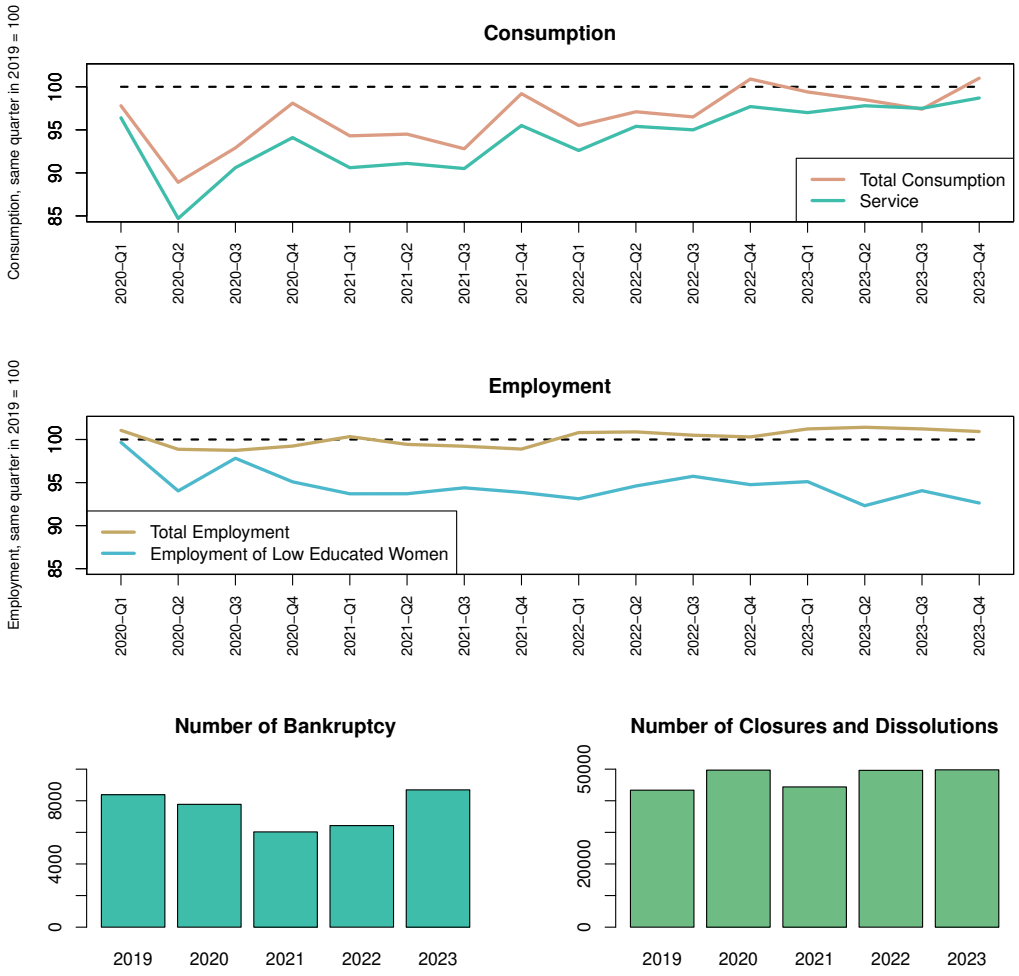
Figure 1: Infection and Mobility



Notes: Infection data are from Our World in Data (Max Roser and Hasell, 2020). The mobility index is from the COVID-19 Community Mobility Reports of Google.

Figure 2: Economic Trends



Notes: Consumption data are from the National Account reported by the Cabinet Office. Employment data are from the Labor Force Survey provided by the Statistics Bureau. Tokyo Shoko Research published the numbers of bankruptcy units, closures, and dissolutions. Here, bankruptcy refers to the suspension of a business under the law or by banks and creditors. Closures and dissolutions are suspensions other than bankruptcy. Among them, more than half have no particular difficulty associated with assets or business profits.