
**Employment Rate of Japan in the 2000s: An Early Assessment of Abenomics**

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1 Introduction

Aging of the population is ongoing in the most developed countries and securing the labor force to sustain the increasing dependency ratio is the prioritized policy goal in many developed countries. Japan is the forerunner in the population aging race; 65 years old or older was 20.1% of the total population in 2000 and is 32.3% in 2019. In addition to this rapid aging, the population of Japan was peaked in 2010 and started to decrees since then. Despite these negative factors for employment, the number of employment of Japan has continued to grow because of the consistent increase of the employment rate. This paper analyzes the increased aggregate employment rate of Japan in the 2000s paying attention to the rapid change of demographic composition.

The analysis reveals that the aging of population worked as a significant factor to decrease the aggregate employment rate, but the increase of the gender and age group specific employment rate was so large such that the negative effect of aging was exceeded. Specifically, the employment rate of Japan increased by 1.1 percentage points from 2000 to 2019, but the aging of the population would have decreased the employment rate by 5.2 percentage points if the gender and age specific employment rate were constant from 2000. Thus, the increase of gender and age specific employment rate contributed to increase the aggregate employment rate. Particularly, the employment rate of prime age female (25-64 years old) increased from around 60% in 2000 to around 75% in 2019. The increase of employment has been absorbed into the health and welfare sector.

Several papers assessed the impacts of the labor market or family policies on female employment of Japan. For example, Abe (2011) assessed the impact of Equal Employment Opportunity Law on female employment rate. Yamaguchi (2017) and Asai (2012) assessed the impact of parental leave policy. Yamaguchi (2017), Nishitateno and Shikata (2017) and Nagase (2018) assessed the impact...
Figure 1: Employment rate

of availability of child care facility. Different from these papers, the current paper implement the gender and age decomposition analysis of the overall employment rate to shed light on the roles of aging and the gender-age specific employment rate. This exercise is useful because we can learn the relative importance of each gender and age group to explain the change in the aggregate employment rate. Kawaguchi and Mori (2019) documented the overall change of labor market of Japan during the 2000s, but they did not implement the full-blown decomposition analysis. The closest paper to ours is Abraham and Kearney (2018) that implements the decomposition analysis to explain the declining employment rate in the USA.

2 Changes in employment rates

2.1 Overall changes in employment rate

To begin with, we describe the overall tends of the employment rate by gender. We rely on the Labor Force Survey (LFS) conducted by Bureau of Statistics. LFS is a monthly household survey with about 40,000 households that mainly
The time series of the employment rate among 15 years old and older appears in Figure 1. The female employment rate had been around 47% until 2012, but it started to increase almost monotonically since then and reached up to 54% by the end of 2019. In contrast, the male employment rate dropped from 75% to 72.5% between January 2009 and January 2010, most probably due to the effect of global financial shocks.

The difference of the employment rate relative to January 2000, reported in Figure 2, highlights the change in the employment rate. What are the driving forces behind these changes in employment rates? An important aspect of Japanese labor market to understand the aggregate change of employment rate is the change in the age composition of the population. The Japanese population has shifted to the older population as shown in Table 2. Share of 65 years old

- The survey adopts stratified two step sampling method using the census tract as the primary sampling unit and housing unit as the secondary sampling unit. The rotating sampling method is used so that newly selected housing units are survey in two consecutive months and the same two consecutive months in the following year: 2-months-in, 10-months-out, and 2-months-in.
and older increased from 20.1% in 2000 to 32.3% in 2019. This drastic change in age composition of population mechanically changes the overall employment rate because the employment rate differs substantially across age groups. As of 2000, the employment rate of 25-44 years old was 77.5% while that of 65 years old and older was 22.1%. Thus, the aging of population mechanically decreases the employment rate because of the composition effect. Thus, to shed light on the mechanism behind these overall changes in employment rates for both genders, we first decompose the changes into the age composition changes and the changes within an age group.

2.2 Age decomposition

Changes in aggregate employment can be decomposed into the age composition of the population and the changes in the employment rate within an age group. Let \( P_t \) be a working age population and \( E_t \) be a total number of employed workers. For each demographic category \( g \), \( P_{g,t} \) and \( E_{g,t} \) are the numbers of population and employed workers. Then, \( P_t = \sum_g P_{g,t} \) and \( E_t = \sum_g E_{g,t} \). Using these notations, the aggregate employment rate is expressed as the weighted sum of age specific employment rate:

\[
\frac{E_t}{P_t} \equiv e_t = \sum_g s_{g,t} e_{g,t},
\]

where \( s_{g,t} = P_{g,t}/P_t \), the share of specific age group in the population, and \( e_{g,t} = E_{g,t}/P_{g,t} \), the age specific employment rate. Using this property, the total change of employment rate between an initial period 0 and a period \( t \) can be decomposed into the change in the age composition of the population and the change in the employment rate within a specific age group. Specifically,

\[
e_t - e_0 = \sum_g (e_{g,t} - e_{g,0}) s_{g,0} + \sum_g e_{g,0}(s_{g,t} - s_{g,0}) + \sum_g (e_{g,t} - e_{g,0})(s_{g,t} - s_{g,0}).
\]

According to the age grouping of the aggregate statistics of Labor Force Survey, we define the age group \( g \) as (1) 15-24 years old, (2) 25-44 years old, (3) 45-64 years old, and (4) 65 years old or older. Report aggregate contributions as \( \sum g e_{g,0}(s_{g,t} - s_{g,0}) \), \( \sum g (e_{g,t} - e_{g,0}) s_{g,0} \), and \( u_t \).

The results of the decomposition appears in Figure 3. The result for female shows that the change of age composition negatively affected the aggregate employment rate since the early 2000s. Thus, the driving force for the increased female employment rate has been the increase of employment rate within an age group. Within an age group, the female employment rate increased by 10 percentage points between January 2012 and January 2020. The contribution of the interaction term is negligible for the change of female employment; the effect was slightly negative if there is any. The result for male also shows that the change of age composition negatively affected the aggregate employment rate.
but the increase of employment rate within an age group positively affected the increase of employment rate from 2013. On the balance between the two counteracting effects, the aggregate employment rate had increased slightly since the middle of 2010s. The impact of interaction effect is virtually zero.

To analyze which age group contributes to the change in aggregate employment rate by age groups, Figure 4 reports the contribution of employment effect as \((e_{g,t} - e_{g,0})s_{g,0}\). This detailed composition shows that the increase of employment rate among female 25-44 years old and 45-64 years old significantly contributed to the increase in the aggregate female employment rate. On the other hand, the employment effect among 15-24 years old and 65 years old and above have negligible impacts on the aggregate female employment rate. Thus, to explain the sharp increase of aggregate female employment rate, the key is to explain the increase of employment rate of prime-age female between 25 years old and 64 years old. Looking at the male age specific employment rate, the increase of the employment rate of 25-44 years old is notable.

Table 1 reports the employment rate and the population share of each gender and age groups. The result of exact decomposition of (2) appears in Table 2.
Table 1: changes of employment rate and population composition by age groups, 2000-2019

<table>
<thead>
<tr>
<th>Age</th>
<th>$E/P_{2000}$</th>
<th>$E/P_{2019}$</th>
<th>$\Delta E/P$</th>
<th>$s_{2000}$</th>
<th>$s_{2019}$</th>
<th>$\Delta s$</th>
</tr>
</thead>
<tbody>
<tr>
<td>15-24</td>
<td>0.428</td>
<td>0.475</td>
<td>0.047</td>
<td>0.149</td>
<td>0.110</td>
<td>-0.039</td>
</tr>
<tr>
<td>25-44</td>
<td>0.775</td>
<td>0.856</td>
<td>0.080</td>
<td>0.319</td>
<td>0.265</td>
<td>-0.054</td>
</tr>
<tr>
<td>45-64</td>
<td>0.726</td>
<td>0.819</td>
<td>0.094</td>
<td>0.330</td>
<td>0.302</td>
<td>-0.028</td>
</tr>
<tr>
<td>65-</td>
<td>0.221</td>
<td>0.249</td>
<td>0.028</td>
<td>0.201</td>
<td>0.323</td>
<td>0.122</td>
</tr>
</tbody>
</table>

Male

<table>
<thead>
<tr>
<th>Age</th>
<th>$E/P_{2000}$</th>
<th>$E/P_{2019}$</th>
<th>$\Delta E/P$</th>
<th>$s_{2000}$</th>
<th>$s_{2019}$</th>
<th>$\Delta s$</th>
</tr>
</thead>
<tbody>
<tr>
<td>15-24</td>
<td>0.426</td>
<td>0.466</td>
<td>0.040</td>
<td>0.158</td>
<td>0.117</td>
<td>-0.041</td>
</tr>
<tr>
<td>25-44</td>
<td>0.934</td>
<td>0.931</td>
<td>-0.004</td>
<td>0.333</td>
<td>0.279</td>
<td>-0.053</td>
</tr>
<tr>
<td>45-64</td>
<td>0.869</td>
<td>0.906</td>
<td>0.037</td>
<td>0.337</td>
<td>0.313</td>
<td>-0.024</td>
</tr>
<tr>
<td>65-</td>
<td>0.331</td>
<td>0.341</td>
<td>0.010</td>
<td>0.173</td>
<td>0.291</td>
<td>0.118</td>
</tr>
</tbody>
</table>

Female

<table>
<thead>
<tr>
<th>Age</th>
<th>$E/P_{2000}$</th>
<th>$E/P_{2019}$</th>
<th>$\Delta E/P$</th>
<th>$s_{2000}$</th>
<th>$s_{2019}$</th>
<th>$\Delta s$</th>
</tr>
</thead>
<tbody>
<tr>
<td>15-24</td>
<td>0.431</td>
<td>0.484</td>
<td>0.054</td>
<td>0.141</td>
<td>0.103</td>
<td>-0.038</td>
</tr>
<tr>
<td>25-44</td>
<td>0.613</td>
<td>0.778</td>
<td>0.165</td>
<td>0.306</td>
<td>0.251</td>
<td>-0.055</td>
</tr>
<tr>
<td>45-64</td>
<td>0.586</td>
<td>0.732</td>
<td>0.146</td>
<td>0.325</td>
<td>0.292</td>
<td>-0.033</td>
</tr>
<tr>
<td>65-</td>
<td>0.143</td>
<td>0.179</td>
<td>0.036</td>
<td>0.228</td>
<td>0.353</td>
<td>0.126</td>
</tr>
</tbody>
</table>

Table 2: Decomposition of the change in employment rate 2000-2019

\[
\Delta E/P = \sum_\alpha s_{\alpha,2000} \Delta (E/P)_\alpha - \sum_\alpha \frac{E/P_{\alpha,2000}}{\sum_\alpha E/P_{\alpha,2000}} \Delta s_{\alpha} - \sum_\alpha \frac{\Delta E/P_{\alpha}}{\sum_\alpha \Delta E/P_{\alpha}} \Delta s_{\alpha}
\]

<table>
<thead>
<tr>
<th></th>
<th>$\Delta E/P$</th>
<th>$\sum_\alpha s_{\alpha,2000} \Delta (E/P)_\alpha$</th>
<th>$\sum_\alpha \frac{E/P_{\alpha,2000}}{\sum_\alpha E/P_{\alpha,2000}} \Delta s_{\alpha}$</th>
<th>$\sum_\alpha \frac{\Delta E/P_{\alpha}}{\sum_\alpha \Delta E/P_{\alpha}} \Delta s_{\alpha}$</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total</td>
<td>0.011</td>
<td>0.069</td>
<td>-0.052</td>
<td>-0.005</td>
</tr>
<tr>
<td>Female</td>
<td>0.051</td>
<td>0.114</td>
<td>-0.051</td>
<td>-0.011</td>
</tr>
<tr>
<td>Male</td>
<td>-0.031</td>
<td>0.019</td>
<td>-0.049</td>
<td>-0.001</td>
</tr>
</tbody>
</table>
2.3 The source of increased employment rate

The analysis heretofore revealed that the increase of aggregate employment rate of both genders is largely due to the employment rate effect, the increase of employment rate within an age group. To understand the mechanism behind the increased employment rate within an age group, we examine where those newly employed people are from, paying attention to the identity that the population is decomposed into those who are employed ($E$), unemployed ($U$) and inactive (out of labor force) ($N$): $P = E + U + N$. Using this identity, the total employment rate can be rewritten as

$$e_t = \frac{E_t}{P_t} = 1 - \sum_g s_{g,t} u_{g,t} - \sum_g s_{g,t} n_{g,t},$$

(3)

where $u_{g,t} = U_{g,t}/P_{g,t}$ is age-specific unemployment rate and $n_{g,t} = N_{g,t}/P_{g,t}$ is age-specific inactive rate. Thus, the change in aggregate employment rate can be decomposed into
where $u_t$ is the interaction term. Since we already reported the demographic and interaction effects, we only report the contribution of the first two terms: the contributions due to the transitions from the out of labor force and the unemployment: $\sum_g s_{g,0}(u_{g,t} - u_{g,0})$ and $\sum_g s_{g,0}(n_{g,t} - n_{g,0})$. Figure 5 illustrates the transitions from two status by gender.

The upper panel shows that the increase of female employment rate from the out of labor force status contributed to increase the aggregate employment rate by more than 10 percentage points. The increase was particularly notable after 2012, implying that those women who were out of labor force started to be employed since the beginning of the Abenomics. In contrast, the contribution due to the transition from inactive status is quite limited among male. Paying an attention to the difference in the scale of vertical axis, we notice that the lower
Figure 6: Detail employment decomposition

panel shows that the contribution due to the inflow from the unemployment is much less important factor to explain the overall increase of the employment rate for both genders. The transitions from unemployment to employment are procyclical for both genders. In the early 2000s until around 2003, the inflow from the unemployment negatively contributed to the employment growth while its contribution turned into positive after 2003 until 2009. The global financial crisis sharply decreased the employment growth due to the sudden increase of the unemployment. In the long process of recovering from the negative blow from the global financial crisis, the decrease of unemployment positively contributed to the aggregate employment growth. Comparing the trends of female and male, the contribution of unemployment to employment transition among male is twice as more important as that among female. Unemployed male workers have succeeded to find jobs during the long term macroeconomic expansion during the Abenomics.

Figure 6 further report the age decomposition of the unemployment to employment transition. The right panels report the contribution due to the transition from the out of labor force to the employment $s_{g,0}(u_{g,t} - u_{g,0})$, whereas the left panels report the contribution due to the transition from out of labor force
to employment status, \(s_{g,0}(n_{g,t} - n_{g,0})\). The left panels clearly indicate that the increased transition from inactive to employment transition was concentrated among 24-44 years old and 45-64 years old. Thus, to explain the dramatic increase of female employment rate, we should explain why the transition from inactive status to employment status increased among prime-age women. In particular, the trend of increase in the transition from out of labor force to employment has accelerated around 2012 among 44-64 years old female. We also find the increased transition from out of labor force to employment among people who are 65 years old or older in both female and male. The left panels of Figure 6 show that the contribution of the transition from unemployment to employment is rather limited. We can note that procyclical movement of unemployment to employment transition is significant among all age groups except for the 65 years old and older. The procyclicality is particularly significant among youth aged between 15 years old and 24 years old. Thus to explain the aggregate employment rate among male population, the steady recovery from the global financial crisis has played a significant role.

Overall, the aggregate employment rate increased among both female and male but the adjustment margins were different between genders. For female, drawing inactive population into the employment played a significant role; while for male, the transition from unemployment to employment played a significant role. To understand the increase of employment rate among female, shedding light on the mechanism for the activation of the female labor force is the key. The contrast between genders also reflects the strength of labor force attachment between females and males. When negative shock hit the economy, unemployment increases for both genders, but the effect is stronger among male workers because those who lost their job stay in the labor market as the unemployed but a part of female workers exits from the labor market, becoming inactive.

The age decomposition of the aggregate employment rate change by gender reveals that the significant increase of employment rate among prime-age women is not simply attributable to the long term macroeconomic expansion of the macro economy. It rather seems due to the structural change of the labor demand that expanded the employment opportunity among prime age female and the change of the supply that encouraged the labor force participation of the group. These changes apparently induced the increase of employment rate among prime age female from inactive status.

### 2.4 Decomposition by Working status

Critics claim that the employment rate may have increased during the Abenomics, but the increase was concentrated among unstable non-regular employment. The analysis in this subsection attempts to shed light on the type of employment that increased during the Abenomics. As the first attempt, we examine how respondents of the labor force survey classify their employment. Among these who respond being employed, there are 4 categories regarding how they describe their working status: mainly work, work aside of doing household work, work aside of studying, or furloughed. We bundle the second and third
choices to create a category “work as sub activity.” The following figure reports the contribution of working status.

The figures indicate that the increase of employment rate is due to the increase of people who work as their main activity. The trends are common among male and female but it is more striking among female. Particularly, the steady increase of female employment rate of those 25 to 44 years old from the early 2000s and the sharp increase of female employment of those 45 to 64 years old from 2012 is almost due to the increase of female who mainly work. We do not find the significant increase of those who work as sub activity (work aside doing house work or studying) except for minor increase among female 44 to 64 years old and male 15 to 24 years old. The steady increase of furlough among female 25 to 44 years old from 0% to 1% starting around 2000 is due to the increase of those who take parental (mostly maternity) leave as the parental leave is categories as furlough. The apparent spike of furlough in 2000 among prime-age female and male is due to the negative shock by COVID-19. We will pay particular attention to this phenomena in the subsequent section.
2.5 Decomposition by Industry

To shed further light on the increase of employment rates among men and women from the labor demand side, we decompose the changes in employment rates by age groups by industry. The aggregate employment rate in year $t$ is decomposed into the employment rate by industries as following:

$$ e_t \equiv e_t = \frac{E_t}{P_t} = \sum_{a,j} \frac{E_{a,j,t}}{P_{a,t}} = \sum_{a} s_{a,t} \sum_{j} e_{a,j,t}, \quad (5) $$

where $s_{a,t} = P_{a,t}/P_t$ is the population share of age group $a$ in year $t$ and $e_{a,j,t} = E_{a,j,t}/P_{a,t}$ is the employment rate in the industry $j$ among the population of age group $a$ in year $t$. Using this decomposition, the change in employment rate is decomposed as:

$$ e_t - e_0 = \sum_{g} e_{g,0} (s_{g,t} - s_{g,0}) + \sum_{g} s_{g,0} \sum_{j} (e_{g,j,t} - e_{g,j,0}). \quad (6) $$

The second term shows the contribution of change in employment rate composition by industry of a specific age group $a$ in year $t$.

Since we have demonstrated that the employment growth among prime-age is important, the industry decomposition of employment growth for the group of
25-44 years old and 45-64 years old are reported in Figure 8 and 9.\(^2\) The figures illustrate age and industry specific employment rate change, \( (e_{g,j,t} - e_{g,j,0}) \) for both genders. The time series start from 2007 in these figures because the Japan Standard Industry Code was revised in 2007 and concordance before 2007 is rather difficult. We should note the codes were revised again in 2013 that created a discontinuity in the series. First, focusing on younger prime-age people between 25 and 44 years old, the graphs clearly show that the increase of the employment rate is concentrated in Health and Welfare industry. The increase of employment in this sector is observed for both females and males but the change was more significant among females. The expansion of the employment in health and welfare industry manifests the the aging of the population from the labor demand side. The increase of older people, fueled by the introduction of the long-term care insurance in 2000, expanded those who receive the elderly care service (Campbell and Ikegami, 2000). The expansion of the service had been supported by the increase of employment rate of middle aged women from the view point of labor market. The second notable change is the increase of employment rate in the retail industry among females in this age group.

\(^2\)For completeness, the figures for 15-24 years old and 65 years old and older are reported in Appendix.
3 What account for the increase of female employment rate?

This section summarizes the findings from the existing studies that accounts for significant increase of employment rate. We pay particular attention to the mechanism behind the increase in prime age female employment rate. One of the primary reason behind the increase of female employment rate is the increase of the fraction of single women. However, Nagase (2018) report the increase of employment rate among women with 0 to 3 years old children in 2013-2015 compared with the period 2002 - 2012 by 3 percentage points.

We next discuss the contributions of family policies as the mechanism to explain the increase of employment rate among prime age married women. A significant change in family policy of Japan in the last three decades is the introduction and the expansion of the parental leave policy. The government first introduced the parental leave to offer job protection up to one year in 1992 without cash benefit. Then the government expands the system by introducing the cash benefit that compensate 25% of the monthly salary before the leave in 1995. The replacement rate was increased to 40% in 2001. By then, the parental leave only covered regular workers, but the coverage was extended to non-regular workers in 2005. Then the replacement rate was increased to 50% for both regular and non-regular workers. Yamaguchi (2017) demonstrated that the provision of one-year job protection contributed to increase the female employment rate by 0.54 percentage points after child bearing. On the other hand, the provision of cash benefit did not affect the employment. Asai (2012) similarly showed that the increase of the replacement rate of cash benefit in 2001 did not increase the female employment rate. Overall, the expansion of maternity leave does not account for the increase in prime-age female employment rate during the Abenomics.\(^3\)

4 Does COVID-19 blow off the employment gains during the Abenomics?

Analysis heretofore documents the significant employment rate increase after Prime Minister Shinzo Abe took his office in December 2012 and started Abenomics. Rather suddenly, on August 28, 2020, he expressed his intention to resign due to the health concern. His 7 years and 8 months long term ends in the middle of COVID-19 pandemic and the consequent shrinkage of economic activities. GDP of the second quarter (April-June) of 2020 shrank by 7.9% compared with the same period in the previous year according to the second preliminary estimate by the Cabinet Office.

Since the negative shock to the economy was so significant, some claim that

\(^3\)Asai (2019) reports that the increase of cash benefit increased the probability to work as a full-time worker. Kureishi et al. (2016) reports that shorter maternity leave increases the probability to work as a full-time worker.
the labor market gains during the Abenomics will be completely blown off due to the pandemics. Is the claim real or will the labor market bounce back once the pandemic is contained? As of September 2020, it is too early to derive a definitive conclusion toward these questions, however, we attempt to foresee what will happen based on the observation up to July 2020, which is the most recent LFS available. Contrary to the popular pessimism in the media, we foresee that the labor market will bounce back after the containment of COVID-19. Below, we will explain why we think so.

To document the sharp contraction of the labor market, we draw the change in employment rate of each month throughout 2020 relative to January, the month only a few COVID-19 cases are reported in Japan. As a reference, we compare the monthly changes in employment rate throughout 2008, the year Japan was affected by the Great Recession. According to the Composite Index of the business conditions by the Cabinet office, the peak before the recession was January 2008. Further, to remove the seasonality, we report the difference of employment rate from the same month in the previous year, and the difference in January is normalized to zero. Figure 10 thus reports \( (e_t - e_{t-12}) - (e_{t_0} - e_{t_0-12}) \) where \( t \) indicates a specific month, and \( t_0 \) is January 2008 or 2020.

The figure shows that employment rate plummeted by 1.5 percentage points for female from January to April. The drop was 1.3 percentage points for male from January to May. These drops are quite limited compared with the 10 percentage points drop of employment rate of both genders from 61.2% to...
51.3% in the US. Although this US series is not seasonally adjusted and not directly comparable, the effect of adjustment is minor because there is not much seasonality of employment rate. Having noted that the negative blow was rather limited in absolute term, the impact after COVID-19 has been larger than the impact after the Great Recession for both female and male. It is notable that the female employment rate stay low from April to July, in contrast, male employment rate has rebounded toward July. While it is too early to conclude anything, but the difference of the employment rate between genders might capture the difference of the labor force attachment between female and male.

We now examine the change in employment rate since the outbreak of COVID-19 by age and gender to see the heterogeneity. Figure 11 draws the time series changes from January of 2020 and 2008 for the purpose of comparison. The figures show that the adjustment were particularly severe among youth aged between 15 and 24. For example, the female employment rate of 15-24 years old plummeted by 4 percentage points from January to July. The relatively larger adjustment among the youth is probably because they due to weaker attachment to employment. In contrast, the employment rate of older people, another group of people who have weaker attachment to employment, does not drop significantly after the outbreak of COVID-19. Finally, the drop of employment rate among prime-age female between 25 and 64 years old is rather limited; the drop was 2.5 percentage points at the maximum. This drop of employment rate among prime age female is rather limited compared with
about 7 percentage points increase of the employment rate among these groups during the Abenomics. Thus, the claim that the employment gain during the Abenomics are blown due to the COVID-19 is exaggerated claim.

A caveat of analyzing the employment status using Labor Force Survey is that the definition of being employed includes those workers who are furloughed. As we have seen previously, the fraction of workers who are furloughed spiked in 2020 in the long-term time series. We now focus on the movement of the employment status in 2020 with finer resolution. In the analysis we categorize the employment status into four categories: 1. Work (Work as the main activity, Work aside of studying, Work aside of homemaking), 2. Furloughed (Kyūgō), 3. Unemployed, and 4. Out of labor force. The following figures draw the fraction of each group in the population with seasonality adjustment using the seasonality of the previous year: the plotted time series are $e_t - e_{t-12} - (e_{t_0} - e_{t_0-12})$ as before.

Figure 12 shows the time series of detailed employment status of female by age groups. The figures show that the fraction of people who actually work dropped sharply from January toward April and the fraction furloughed increased correspondingly. The drop of the fraction actually worked was close to 10 percentage points among youth aged between 15-24. At the same time, among the youth, the fraction furloughed and the fraction who were out of labor force increased from January to April. The fraction furloughed peaked in April and returned to almost zero by July. The decrease of the fraction furloughed
Figure 13: Male employment status: Financial VS COVID-19 shock

corresponds to the increase of the fraction worked from April to July. In the end, by July 2020, the negative shock by COVID-19 decreased the employment rate of 15-24 years old by about 5 percentage points and increased the out of labor force by about the same percentage points. As a result of this weak attachment to the labor force of young female, the unemployment rate almost did not change at all. The trends are qualitatively similar for prime-age females 25-44 and 45-64 years old, but quantitatively the increase of the fraction out of labor force is limited for these age groups. For 65 years old and older females, the decrease of the fraction of worked were quite limited. Overall, among females, the negative shock of COVID-19 increased the fraction out of labor force by July, but the impact was limited among youth aged between 15 and 24 years old. Among prime-age females among whom we have observed significant increase of female employment rate during the Abenomics, we did not observe the decrease of employment rate. Thus, the claim that the employment gain during the Abenomics was blown off by the COVID-19 is not empirically supported.

Figure 13 shows the time series of detailed employment status of male by age groups. The figures show that the fraction of people who actually work dropped sharply from January toward April and the fraction furloughed increased correspondingly. The drop of the fraction actually worked was most significant among youth aged between 15-24. The fraction furloughed peaked in April and returned to almost zero for all age groups. As the fraction furloughed decreased from April to July, the fraction worked increased correspondingly. While the
fraction furloughed returned to zero by July, the fraction worked did not completely returned to zero. Some of those who were furloughed around April did not return to work but absorbed into unemployment as we observe slight increase of the fraction unemployed. Overall, among male. Overall, among males, the negative shock of COVID-19 was temporarily absorbed by furlough and then almost all the shock were resolved by July. This is the anatomy why we do not observe the significant increase of unemployment rate among male.

5 Conclusion

This paper analyzed the change in the employment rate of Japan in the 2000s, paying particular attention to the change of age composition of the population. Japan’s employment rate would have decreased by 5-6 percentage points if age-specific employment rate did not increase from 2000 due to the aging of the population, but the increase of employment rate within a specific age group increased the aggregate employment rate by about 7 percentage points. Thus, in total, the aggregate employment rate increased slightly from 2000 to 2019.

The increase of age and gender specific employment were particularly significant among prime-age females - those who are 25-44 and 45-64 years old. Industry level analysis reveals that the increase of employment of this group is most significant in the health and welfare industry, followed by the wholesale and retail industry and the education industry. Particularly significant increase of employment in the health and welfare industry reflects the aging of Japanese population from the labor demand side. Overall, the aging of the population fundamentally shaped the changes of employment rate of Japan during the 2000s.

We only focus on employment and did not analyze the change of wages. However, the large increase of employment rate particularly among females who used to be out of labor force has significant implication for the changes of mean wages, because the mean wages are affected by the composition of labor force. Fiscal and monetary authorities as well as macroeconomists working on Japanese economy carefully tracks the mean wage series calculated based on Monthly Labor Survey that can observe the distinction between full time and part time workers at most as the measurement of labor quality. Adjusting for the changes of unobserved labor quality may be difficult, but, at least, publishing the mean wage series adjusted for workers characteristics such as gender, age, and education is indispensable to better monitor the wage change.

We assessed the impact of the COVID-19 on employment and found that the impact on the employment have been rather minor. We observed the temporary increase of furlough but many of them have backed to work by July 2020. Thus, we do not find empirical support for the claim that COVID-19 blew off the employment gain, particularly among prime age females, during the Abenomics.

We rather have to pay close attention to the increase of out of labor force among young females between 15 and 24 years old. This negative impact may cast a long shadow on the career development of the youth given the rigid labor market of Japan as pointed out by Genda et al. (2010).
References


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Figure 14: Industry decomposition: 15 - 24

Figure 15: Industry decomposition: 65 -