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Sources of Income Inequality: A Comparison of Japan and the United States

Toshiaki Aizawa
Asian Development Bank Institute

Robert Dekle
University of Southern California

Matthias Helble
Asian Development Bank Institute

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Keywords
income inequality, Japan, United States, wages, education, marital status, working hours

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SOURCES OF INCOME INEQUALITY: A COMPARISON OF JAPAN AND THE UNITED STATES

Toshiaki Aizawa,
Robert Dekle, and
Matthias Helble

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Toshiaki Aizawa is a research associate at Asian Development Bank Institute (ADBI). Robert Dekle is a professor of economics at USC Dornsife College. Matthias Helble is a research economist at ADBI.

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Please contact the authors for information about this paper.

Email: toshiaki.aizawa3818@gmail.com; dekle@usc.edu; mhelble@adbi.org

Asian Development Bank Institute
Kasumigaseki Building, 8th Floor
3-2-5 Kasumigaseki, Chiyoda-ku
Tokyo 100-6008, Japan

Tel: +81-3-3593-5500
Fax: +81-3-3593-5571
URL: www.adbi.org
E-mail: info@adbi.org

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JEL Classification: D33, O51, O53

Contents

1. INTRODUCTION

In recent years we have witnessed a surge of new research on the topic of income inequality. A large part of the work was triggered by Thomas Pikettey's 2014 book, *Capital in the Twenty-First Century*. However, the study of income inequality has a long history. Several of the key concepts of income inequality, such as the Gini coefficient, were developed over 100 years ago. In order to understand the source of income inequality, economists started to develop methods for regression-based decomposition of inequality in the 1970s. Pioneered by the work of Oaxaca (1973) and Blinder (1973) to decompose the difference in mean income between two groups, the methods became more sophisticated, e.g., Bourgninon (1979). Today, it has become standard to use a regression-based decomposition analysis. In this paper we follow an approach closely related to Wan (2004).

The existing empirical literature on income decomposition for the two countries is surprisingly thin. For Japan, most studies that apply the decomposition techniques try to better understand the income disparities among Japanese regions, e.g., Higashikata (2013). One recent paper by Yamaguchi (2014) looks at source of income inequality for Japan. He argues that gender, age, marital status, education, and employment duration are important drivers of income inequality in Japan and account for one-third of income inequality in Japan. The remaining income inequality rests unexplained.

For the United States, one of the earlier contributions is the paper by Lerman and Yitzhaki (1985). Their main objective is to develop a new method to determine the impact of different sources of income to the overall income inequality. The authors show theoretically that each source's contribution to the Gini coefficient is a product of the source's own Gini, its share of total income, and its correlation with the rank of total income. Applying the method to post-transfer family income data from 1981, the authors find that almost 30% of income inequality can be explained by the difference in the wages of the family head. Another 25% is due to difference in hours worked.

One weakness of their methodology was that it could only employ variables for which an inequality can be calculated. Furthermore, the authors were unable to explain wage inequality. These weaknesses were overcome by Cowell and Jenkins (1995). The authors develop a simple method to estimate the contribution of individual population characteristics and groups of characteristics. Exploiting the US Panel Study of Income Dynamics data for 1986, the authors find that age, sex, and race explained about one-quarter of inequality of current income. When adding the number of earners, the model can explain up to 30% of income inequality. The authors conclude that the low level of explanatory power is due to within-group inequality, which cannot easily be measured.

Fields (2002) presents a methodology to decompose income among a specified group, as well as between groups and time periods. Applying the methods to data from the United States' 1980 and 2000 annual demographic surveys, the results show that schooling was the most important driver of income inequality (16%), followed by type of occupation (9%), experience (7%), and gender (6%). He does not find results close to zero for regional differences, race, and industry. The result that race is not contributing to income inequality in the United States is somehow surprising, given that it was a significant contributor in all previous studies.

The main objective of this paper is to compare the sources of income inequality in Japan and the United States. We have chosen these two countries for the following reasons: First, both countries enjoy a high level of GDP per capita while at the same time have a rather different income distribution. Whereas the United States has one of

the most unequal income distributions among developed countries, Japan is known for its large middle class and a less unequal income distribution. Second, detailed household panel surveys are available for both countries that represent a large share of the population. The household surveys hold comparable information on labor income and other socioeconomic variables, which allows us to directly compare both cases.

Our results show that income inequality has similar sources in both countries; however, a close comparison yields compelling insights. Education is the main driver of income inequality in the United States, whereas in Japan it ranks number two. In Japan, marital status is the most important driver of income inequality whereas in the United States being married ranks number three. Furthermore, differences in working hours are the second-most important determinant of income inequality in the United States. In contrast, in Japan working longer hours makes only a negligible contribution to income inequality. This paper contributes to the literature as it is one of the first empirical studies that provides a comparison on income decomposition between two countries.

2. DATA AND METHODOLOGY

2.1 Data

The Keio Household Panel Survey (KHPS) is an annual longitudinal survey of private households in Japan providing not only demographic, occupational, and economic information, but also information on educational background, housing, and more. The KHPS is one of the most comprehensive household surveys for Japan and is conducted by the Panel Data Research Center at Keio University. The KHPS uses a two-stage stratified random sampling of people aged 20–69 in 2004, and was first conducted in January 2004 covering 4,005 households. The last wave for which data is currently available is for 2014. Large parts of the questionnaire have remained identical throughout the years, although some questions have been removed and others added. Questions about individual labor income were added in the 2009 survey and are available thereafter. In our analysis we therefore only exploit waves 6 to 10 (years 2009 to 2013). The original sample size in waves 5 to 8 is 3,691, 3,422, 3,207, and 3,030, respectively. In the ninth and tenth waves, 1,012 and 866 new households were added to the existing sample. Since we are interested in the general sources of income inequality rather than year-by-year changes, we first pooled the observations of the five waves. In a second step, we restricted our sample to household heads that are working and aged 35 to 65. Finally, we deleted all observations with missing or incomplete information on variables used in our regression analysis. The final total sample size is 5,858 observations.

The Panel Study of Income Dynamics (PSID) is a biannual longitudinal household survey in the United States. The PSID is directed by faculty at the University of Michigan. The study began in 1968 with a nationally representative sample of over 18,000 individuals living in 5,000 families in the United States. Information on these individuals and their descendants has been collected continuously, including data covering employment, income, wealth, expenditures, health, marriage, childbearing, child development, philanthropy, education, and numerous other topics. Since for Japan we had detailed data points on individual labor income only from 2009 onward, we decided to use the three latest available waves in the PSID, namely 2009, 2011, and 2013. As in the case of Japan, we first restricted our sample to household heads that are working and aged above 34 and below 66. Deleting those samples with missing values and incomplete answers, the total sample size for the United States was 10,371 observations.

Table 1: Descriptive Statistics of Japan and United States Samples

Japan	Count	Mean	Standard Dev.
Income (10,000 yen)	5,708	519.20	349.18
Age	5,708	49.42	8.34
Male	5,708	0.57	0.50
Married	5,708	0.81	0.39
Family size	5,708	3.55	1.42
Education years	5,708	13.56	2.09
Working hours	5,708	39.66	17.83
Large city	5,708	0.29	0.45
Manufacturing	5,708	0.27	0.44
Services	5,708	0.71	0.46
Self-employed worker	5,708	0.15	0.35
Nonregular worker	5,708	0.33	0.47
Large company	5,708	0.30	0.46

Note: The income is defined as the sum of annual employment income and self-employment, business, and home work income. Annual employment income includes monthly base salary, bonuses, overtime payments, etc.

United States	Count	Mean	Standard Dev.
Income (dollars)	10,371	62,852.66	122,520.75
Age	10,371	48.00	8.34
Male	10,371	0.74	0.44
Married	10,371	0.60	0.49
Family size	10,371	2.88	1.45
Education years	10,371	13.64	2.57
Working hours	10,371	42.93	11.35
Large city	10,371	0.44	0.50
Manufacturing	10,371	0.23	0.42
Services	10,371	0.67	0.47
African American	10,371	0.32	0.47
Asian American	10,371	0.01	0.12
Hispanic American	10,371	0.06	0.24

Note: The income is the sum of several labor and farm income components, including not only wages and salaries but also bonuses, overtime, tips, commissions, professional practice or trade, market gardening, additional job income, and miscellaneous labor income.

The descriptive summary statistics of the variables used in this research is shown in Table 1. In Japan the average income in our sample is around 5.2 million Japanese yen, which corresponds closely to the average national household income reported by the national statistical office of Japan for the same time period.[1] In our sample, most household heads are married (81%) and male (57%). The household size is 3.54 persons on average. The relatively large household size might be explained by the fact that we only look at people between 35 and 65. Single households occupied by students or elderly are also not included.[2] The number of weekly working hours is close

[1] Statistics Bureau of Japan. Results of Total Households. www.stat.go.jp/english/data/sousetai/1.htm (accessed 21 September 2016).

[2] In the questionnaire, students and retired persons are not counted as working, even though they might have some labor income through part-time jobs.

to 40, which corresponds closely to the maximum full-time working hours of 8 hours per day in Japan. Almost 30% of the households live in one of the 21 major cities of Japan. The Japanese government has designated all cities in Japan with a population of above 500,000 as major cities. Of the persons in our sample, 27% work in manufacturing and 70% in service industries. Finally, the percentage of irregular workers is around 33%, which is a good approximation of the national average. In 2012, the national average was 35.2% (Statistics Bureau of Japan 2013).

For the United States the average annual labor income reported by the household heads covered in our sample is about $63,000. The labor income is thus around $10,000 higher compared with the national average as reported by the US Census Bureau.[3] The household size, however, corresponds very closely what the US Census Bureau found for the year 2010–2014, namely 2.63 persons per household. The mean number of education years, about 13.5, is similar to Japan's. In the United States, the working hours are about 3 hours longer compared with Japan. The OECD also reports similarly longer working hours for the United States compared with Japan.[4] About 44% of the sampled people live in large cities.[5] What is rather surprising is that the share of certain minorities in the United States is not accurately reflected in our sample. According to the US Census Bureau, in 2010 African Americans represented 12.6% of the population, Asians 4.8%, and Hispanic Americans 16.3%. In our sample the three numbers are 32%, 1%, and 6%. Given that African Americans have the lowest average household income and the whites the second highest (after Asians), this sample bias might lead to an upward bias in the estimation of the Gini coefficient.

For our sample, the Gini coefficient of income estimated from the sample in 2009–2013 is 0.453 in the United States (The lower bound and the upper bound of the 95% confidence interval are 0.434 and 0.472). It is thus slightly higher compared with 0.408 reported for 2013 in the Human Development Report[6] or the 0.396 estimated by the OECD for 2013.[7] For Japan, we calculate a Gini coefficient of 0.329. (The lower bound and the upper bound of the 95% confidence interval are 0.321 and 0.336.) The Gini coefficient obtained from our sample is close to the number reported by the OECD for 2012, namely 0.336.[8]

2.2 Methodology

Our decomposition adopts a regression-based approach. Following the seminal work of Shorrocks (1999, 2013) we decompose the inequality in income by the Shapley decomposition. The Shapley methodology is based on cooperative game theory and commonly used in the decomposition analysis of income inequality (Wan 2004). It allows us to decompose the original income variable in a nonlinear income generating function. The Shapley approach is built around the expected marginal contribution of each component. The Shapley decomposition calculates the marginal impact of each

[3] United States Census Bureau. Quick Facts. www.census.gov/quickfacts/table/PST045215/00 (accessed 21 September 2016).

[4] OECD.Stat. Average annual hours actually worked per worker. https://stats.oecd.org/Index.aspx ?DataSetCode=ANHRS (accessed 21 September 2016).

[5] Large cities are defined as central and fringe counties of metropolitan areas of 1 million population and more.

[6] United Nations Development Programme. Human Development Reports. Income Gini coefficient. http://hdr.undp.org/en/content/income-gini-coefficient (accessed 21 September 2016).

[7] OECD.Stat. Income distribution and poverty, by country. http://stats.oecd.org/index.aspx?queryid =66670 (accessed 21 September 2016).

[8] Footnote 7.

of the factors as they are eliminated in succession, and then averages these marginal effects over all the possible elimination sequences.

Assume a general income generation function of the following form:

$$Y = f(X_1, \dots, X_K)$$

X_K stands for the different factors that contribute to differences in income across households, such as educational achievements or employment sector. In the Shapley value decomposition we pick one of those variables, X_k, for example educational achievements, and replace all original values with the sample mean of X_k. We thus artificially make everybody equal in terms of educational achievements. We then predict the hypothetical income of every person and thus obtain a new Y_k. Y_k is different for every individual as all income generating variables are still kept identical, except for X_k, which is assumed to be equal. Following the most natural rule of Shorrocks (1999), we can quantify the contribution of X_k to the total income inequality by taking the difference between $I(Y)$ and $I(Y_k)$. I stands for the inequality measure, e.g., the Gini coefficient. In order to know the contribution of each factor, one has to subsequently replace all independent variables with the sample mean and calculate how much income inequality is reduced by equalizing another variable. For further details, see Shorrocks (2013) and Wan (2004). The entire procedure is computationally intensive, especially with a large number of independent variables.

The first step in the decomposition is to estimate the income generating function. In the income generating function we attempt to capture all potential factors that drive income inequality. The functional form of the income generating function is based on Mincer (1958). We estimate the log-linear and linear income generating functions. Both specifications are commonly used in the literature. The log-linear form follows more closely Mincer (1958). However, the linear form is also justified as many income inequality measures are based on linear income measures, such as the Gini coefficient.

Table 2: Factors of Income Generation Function

	Japan	United States
Common factors	Age	Age
	Male	Male
	Married	Married
	Family size	Family size
	Education years	Education years
	Working hours	Working hours
	Large city	Large city
	Manufacturing	Manufacturing
	Services	Services
Country-specific factors	Self-employed worker	African American
	Irregular worker	Asian American
	Large company	Hispanic American

As factors contributing to income inequality, we use the variables in listed in Table 2. Since we are interested in a comparison between Japan and the United States, we first try to identify the maximum number of variables that can be directly compared. The first nine factors are highly similar for both countries and capture some basic socioeconomic and job characteristics of the households. The variables age, male, married, and family size can certainly be compared directly. The duration of education

also holds very similar information in both countries, as the Japanese school system is very similar to the US model. The number of working hours should also be equivalent. The definition of large city is slightly different as in Japan the threshold is 500,000 inhabitants, whereas in the United States it is 1,000,000. Finally, although the understanding of working in manufacturing or services might differ between Japan and the US, as we will see later, these differences seem less important because the contribution of manufacturing and services to income inequality is small in both countries.

The last three variables in Table 2 are country-specific variables considered to be associated with the income inequality. The country-specific variables were chosen based on the coverage in the surveys and on the evidence that we have from previous studies (see section 2) on determinants of income inequality in each country. In Japan we use the working status (self-employed worker, irregular worker, and employed by a large company). There is ample evidence that all three groups earn different wages. For example, the wage of irregular workers has been reported to be consistently lower compared with regular workers (e.g., Weathers 2009). For the United States we use the information of ethnicity (African American, Asian American, and Hispanic American) to supplement the decomposition analysis.

The estimation results of income generation function for Japan and the United States are reported in Table 3 and Table 4. We first compare columns (1) and (2) in both countries. In Japan (Table 3), higher age does not systematically imply higher income. In the log-linear regression we even find a negative effect. In contrast, in the United States (Table 4) we observe a positive effect. For both countries we find a significant wage gap between married and nonmarried heads of household. Furthermore, more education increases income in both countries, but more in the US compared with Japan. When including country-specific variables, in columns (3) and (4), we observe that nonregular workers earn a significantly lower income in Japan. In contrast, being employed by a large company boosts household income. For the United States, our regression corroborates racial discrimination, with African Americans earning significantly less than their white counterparts.

Table 3: Estimated Income Generation Function for Japan

Variable	(1) Log Linear	(2) Linear	(3) Log Linear	(4) Linear
Age	–0.00928***	0.0117	–0.00661***	1.145
	(0.00163)	(0.797)	(0.00156)	(0.783)
Male	0.108***	46.13***	–0.00899	–3.413
	(0.0337)	(15.35)	(0.0383)	(16.07)
Married	0.646***	237.5***	0.623***	227.0***
	(0.0421)	(16.41)	(0.0403)	(15.73)
Family size	0.0124	6.196	0.0154	7.592
	(0.0106)	(5.083)	(0.0102)	(4.955)
Education years	0.0709***	40.66***	0.0568***	34.50***
	(0.00673)	(3.587)	(0.00652)	(3.440)
ln(Working hours)	0.0607**	5.935	0.00294	–18.79
	(0.0241)	(11.74)	(0.0227)	(12.05)
Large city	–0.0158	7.715	–0.00170	13.57
	(0.0303)	(15.29)	(0.0286)	(14.81)
Manufacturing	0.00356	–66.56	–0.0851	–103.2*
	(0.123)	(56.56)	(0.130)	(58.14)

continued on next page

Table 3 *continued*

Variable	(1) Log Linear	(2) Linear	(3) Log Linear	(4) Linear
Services	–0.0349	–62.63	–0.131	–103.7*
	(0.120)	(55.31)	(0.127)	(57.39)
Self-employed worker			–0.247***	–97.45***
			(0.0436)	(21.09)
Nonregular worker			–0.308***	–129.1***
			(0.0359)	(16.49)
Large company			0.218***	107.1***
			(0.0267)	(13.88)
Observations	5,694	5,694	5,694	5,694
R-squared	0.220	0.152	0.272	0.195

* $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$.

Standard errors in parentheses.

Standard errors are adjusted for clustering within-individuals.

Year effects are controlled for.

Table 4: Estimated Income Generation Function for the United States

Variable	(1) Log Linear	(2) Linear	(3) Log Linear	(4) Linear
Age	0.00295**	587.2***	0.00265**	566.3***
	(0.00118)	(181.6)	(0.00116)	(180.6)
Male	0.149***	9,617.3***	0.111***	6,410.2***
	(0.0292)	(1,830.1)	(0.0293)	(1,864.1)
Married	0.351***	21,535.1***	0.310***	17,857.8***
	(0.0279)	(2,591.4)	(0.0282)	(2,479.9)
Family size	–0.00331	960.8	0.000519	1,281.8
	(0.00729)	(1007.5)	(0.00727)	(1,025.6)
Education years	0.118***	8,715.2***	0.110***	8,163.3***
	(0.00411)	(690.1)	(0.00418)	(659.7)
ln(Working hours)	1.169***	46,359.5***	1.164***	45,868.4***
	(0.0405)	(4,948.3)	(0.0405)	(4,914.4)
Large city	0.200***	18,736.9***	0.228***	21,347.2***
	(0.0188)	(3,442.5)	(0.0190)	(3,662.1)
Manufacturing	0.221***	22,039.4***	0.209***	21,249.9***
	(0.0323)	(5,995.4)	(0.0316)	(5,924.4)
Services	0.109***	12,450.3***	0.109***	12,617.2***
	(0.0284)	(2,466.5)	(0.0280)	(2,445.5)
African American			–0.237***	–20,886.8***
			(0.0203)	(1,851.9)
Asian American			–0.0379	–18,992.0***
			(0.0598)	(6,002.0)
Hispanic American			–0.0817*	–3,544.5
			(0.0419)	(3,168.4)
Observations	10,371	10,371	10,371	10,371
R-squared	0.407	0.0819	0.419	0.0874

* $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$.

Standard errors in parentheses.

Standard errors are adjusted for clustering within-individuals.

Year effects are controlled for.

3. RESULTS

Tables 5 and 6 present the results of the decomposition analysis for Japan and the United States. Both absolute and relative contributions (in percentage) are listed in the tables. Whereas columns (1) and (2) show the results using log-linear model, columns (3) and (4) show the results using a linear model. Since we are first interested in a direct comparison between Japan and the United States, we included only those variables in the regression for which we find an exact correspondence in both panel data sets. In a second step (Tables 7 and 8), the decomposition is expanded to include additional country-specific variables in order to better understand the country-specific determinants of income inequality.

Table 5: Decomposition results for Japan (2009–2013)

	Log-linear		Linear	
Variable	(1) Absolute Contribution	(2) Relative Contribution	(3) Absolute Contribution	(4) Relative Contribution
Age	0.0112	3.42%	0.0000	0.00%
Male	0.0087	2.65%	0.0118	3.60%
Married	0.0426	12.97%	0.0561	17.07%
Family size	0.0025	0.77%	0.0044	1.33%
Education years	0.0364	11.09%	0.0642	19.54%
Working hours	0.0052	1.57%	0.0014	0.42%
Large city	0.0004	0.13%	0.0009	0.27%
Manufacturing	0.0002	0.05%	0.0034	1.02%
Services	0.0014	0.41%	0.0040	1.21%
All X's	0.1087	33.08%	0.1461	44.47%
Residual	0.2199	66.92%	0.1825	55.53%
Total	0.3286	100.00%	0.3286	100.00%

Table 6: Decomposition Results for the United States (2009–2013)

	Log-linear		Linear	
Variable	(1) Absolute Contribution	(2) Relative Contribution	(3) Absolute Contribution	(4) Relative Contribution
Age	0.0032	0.70%	0.0121	2.66%
Male	0.0119	2.62%	0.0167	3.68%
Married	0.0375	8.26%	0.0496	10.95%
Family size	0.0002	0.05%	0.0035	0.77%
Education years	0.0783	17.26%	0.1208	26.64%
Working hours	0.0654	14.44%	0.0564	12.44%
Large city	0.0154	3.40%	0.0299	6.59%
Manufacturing	0.0087	1.93%	0.0171	3.78%
Services	0.0028	0.61%	0.0042	0.93%
All X's	0.2234	49.27%	0.3103	68.45%
Residual	0.2300	50.73%	0.1430	31.55%
Total	0.4533	100.00%	0.4533	100.00%

Looking at the relative contributions of the log-linear (benchmark) in the two country cases, we notice that in Japan, the biggest contributor to inequality (except for the residuals) is the marital status. One explanation for this result is that, in general, earning higher income increases the likelihood of getting married. In the United States being married is also an important driver of inequality (8.26%). The same logic as in Japan probably applies; higher income may increase the chances of getting married.

In Japan, the second most important determinant of income inequality is the number of education years with about 11.09% contribution. In contrast, in the case of the United States, differences in educational achievements contribute considerably more to income inequality (17.26%). The difference between the two countries could be explained by the fact that Japan's labor market for high-school graduates offers employment opportunities with higher wages compared with the United States. A recent study by Kawaguchi and Mori (2014) documents that the wage differential between college and high school graduates decreased from 0.35 log point to 0.34 log point in Japan between 1986 and 2008, while during the same period, it increased from 0.43 to 0.65 in the United States. Another observation is that in Japan there is relatively little variation in terms of the number of education years, as most Japanese finish high school as well as some professional college or university with a typical length of an additional 4 years (corresponding histograms can be made available upon request). In the United States, in contrast, the variation of education achievements is much larger (Ryan and Bauman 2016). Compared with Japan, more people do not finish high school, while at the same time more people earn master's degrees.

In the United States, differences in the number of working hours are the second-largest contributor to income inequality (14.44%). In contrast, in Japan this factor is negligible. One reason might be that in Japan overtime work is not always paid. In contrast, in the United States, overtime is typically paid at 1.5 times the normal wage (in Japan 1.25 times).

The age of the respondent contributes significantly to income inequality in Japan and the United States. However, the effect disappears in the linear version for Japan. It is rather surprising that the effect in Japan is not bigger. Japan is known for its seniority-based wage system in which wages are mainly a function of the seniority in the company, rather than productivity. In the United States, earnings increase more slowly with age; especially after the age of 54, the wages only increase marginally (US Bureau of Labor Statistics 2015). In both countries, we notice a gender wage gap, as being male contributes to income inequality in both countries to a similar extent. Family size is a rather small factor to explain income inequality in both countries.

Household location—in a large city or not—explained between 3.40% and 6.59% of income inequality in the United States. The data indicate that wages are significantly higher in large agglomerations. In Japan, the wage gap between those in large cities and the rest seems to be less pronounced. Including a variable to capture the employment in manufacturing or services, we observe that in the United States these differences contribute statistically significantly to income inequality, even though to a small extent. In Japan the contribution is smaller, indicating that wages are similar across sectors.

In Tables 7 and 8 we expand our analysis by including variables that are specific to either Japan or the United States and that have been found to be significant in the income generation function. For the case of Japan, we include three additional dummy variables to better capture the employment situation: being self-employed, being an irregular worker, and being employed by a large company. For the United States, we

define three variables to capture racial differences: African American, Asian American, or Hispanic American.

Table 7: Expanded Decomposition Results for Japan (2009–2013)

	Log-linear		Linear	
Variable	(1) Absolute Contribution	(2) Relative Contribution	(3) Absolute Contribution	(4) Relative Contribution
Age	0.0069	2.09%	0.0016	0.48%
Male	0.0001	0.03%	–0.0001	–0.02%
Married	0.0400	12.17%	0.0478	14.56%
Family size	0.0030	0.92%	0.0041	1.25%
Education years	0.0261	7.94%	0.0437	13.31%
Working hours	0.0002	0.06%	0.0014	0.42%
Large city	0.0000	0.01%	0.0011	0.34%
Manufacturing	0.0023	0.69%	0.0048	1.48%
Services	0.0039	1.19%	0.0051	1.54%
Self-employed	0.0095	2.90%	0.0100	3.03%
Irregular worker	0.0225	6.85%	0.0254	7.72%
Large company	0.0186	5.65%	0.0235	7.15%
All X's	0.1331	40.50%	0.1684	51.25%
Residual	0.1955	59.50%	0.1602	48.75%
Total	0.3286	100.00%	0.3286	100.00%

Table 8: Expanded Decomposition Results for the United States (2009–2013)

	Log-linear		Linear	
Variable	(1) Absolute Contribution	(2) Relative Contribution	(3) Absolute Contribution	(4) Relative Contribution
Age	0.0027	0.60%	0.0108	2.38%
Male	0.0087	1.92%	0.0107	2.36%
Married	0.0326	7.20%	0.0394	8.68%
Family size	0.0001	0.02%	0.0043	0.95%
Education years	0.0727	16.04%	0.1110	24.49%
Working hours	0.0643	14.18%	0.0539	11.89%
Large city	0.0169	3.72%	0.0318	7.01%
Manufacturing	0.0079	1.74%	0.0156	3.45%
Services	0.0026	0.57%	0.0040	0.89%
African American	0.0216	4.77%	0.0397	8.75%
Asian American	0.0000	0.00%	0.0001	0.02%
American Hispanic	0.0012	0.27%	0.0010	0.22%
All X's	0.2313	51.03%	0.3222	71.09%
Residual	0.2220	48.97%	0.1311	28.91%
Total	0.4533	100.00%	0.4533	100.00%

Running the regressions on these two extended sets of variables, we first observe that the results found in Tables 5 and 6 hold. In Japan, being married and educational achievements still form the largest contribution to inequality. The newly introduced variables capturing employment status help to explain a substantive part of income inequality. The fact of being self-employed explains around 3%. Furthermore, being an irregular worker comes with a substantially lower income and thus exacerbates income inequality (7%). Irregular worker status thus makes the third-largest contribution and ranks closely after educational outcomes. Finally, being employed by a large company in Japan contributes almost 6%, which is considerable.

For the case of the United States the inclusion of racial dummies is only substantial for African Americans. The fact that the Hispanic dummy does not make a contribution is somehow surprising, as wages of the Hispanic/Latino population in the United States are reported to be considerably lower than the average (US Bureau of Labor Statistics 2015). The small contribution might be because we have an undersampling of Hispanic Americans in our sample.

4. DISCUSSION AND CONCLUSION

The objective of this paper is to compare and decompose income inequality in Japan and the US. We uncovered that both countries suffer from considerable income inequality, which stems from both common and country-specific factors. In terms of common factors, educational achievement is the most important source of income inequality in both countries. In Japan it is followed by marital status, whereas in the United States the second-largest source is differences in working hours. Among country-specific factors, we observe that working for a large company and having a regular job considerably exacerbates income inequality in Japan. For the US, we find that wage disparity between African Americans and the rest contributes significantly to inequality.

Comparing the two countries shows that the sources of income inequality can be rather different, and thus the policy interventions to mitigate the effects should be as well. In Japan, a reform of the two-tiered labor market, which results in high income differences between regular and nonregular workers, would have to be the priority. Irregular workers are paid substantially lower wages and Japanese labor law requires them to change positions every 3 years. Furthermore, opportunities for career progression are typically limited. The wage gap between regular and irregular workers thus enlarges over time. In Japan, irregular workers are predominantly women. An important policy measure would be to facilitate the move of irregular workers into regular jobs, especially the transition of women. If more women were transitioned into more permanent positions, it would reduce both gender inequality and overall income inequality.

In the United States, education and the different length of working hours are the two main contributors of income inequality. Both variables depend mainly on the individual preference to dedicate more time to education and work. However, educational achievements might not only hinge on personal preferences. For example, the school drop-out rate might be particularly high in low-income neighborhoods, or graduate education might be limited to students with certain financial endowments. Student loans might not always be available. One policy option could to correct market failure for education. High schools with relatively high drop-out rates should be targeted. Finally, lower wages for African Americans still explains 5% to 10% of income inequality in the United States. Although lower wages might be a sign of racial

discrimination, it could also reflect differences in educational quality among schools with varying racial composition. Public policies should try to ensure that all racial groups have the same opportunities, especially in terms of education. Racial discrimination also must be tackled to achieve more equitable outcomes.

This paper is a first attempt to compare the sources of income inequality between Japan and the US. The results are compelling and more research is needed. The current paper has pooled the observations across several years. As a next step, it would be interesting to study how income inequality growth has differed across time. Another option would be to include additional variables that can explain the income inequality. The residuals are still relatively high in our current regressions. We hope that the results of our paper will motivate further research on the compelling topic on income inequality in Japan and the United States.

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