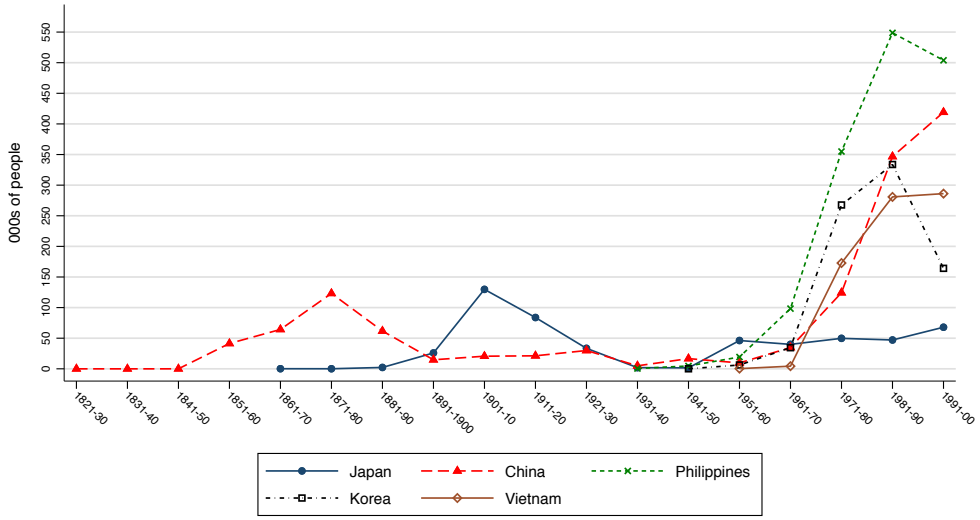
Displacement, Diversity, and Mobility: Career Impacts of Japanese American Internment

Jaime Arellano-Bover

Online Appendices

A Additional Figures and Tables

Figure A1: Asian immigration to the U.S., by decade



Source: Statistical Yearbook of the Immigration and Naturalization Service, 2001.
Note: From 1820-67, figures represent alien passengers arrived at seaports; from 1868-91 and 1895-97, immigrant aliens arrived; from 1892-94 and 1898-2001, immigrant aliens admitted for permanent residence. From 1892-1903, aliens entering by cabin class were not counted as immigrants. Land arrivals were not completely enumerated until 1908.

Figure A2: Location of the 10 internment camps

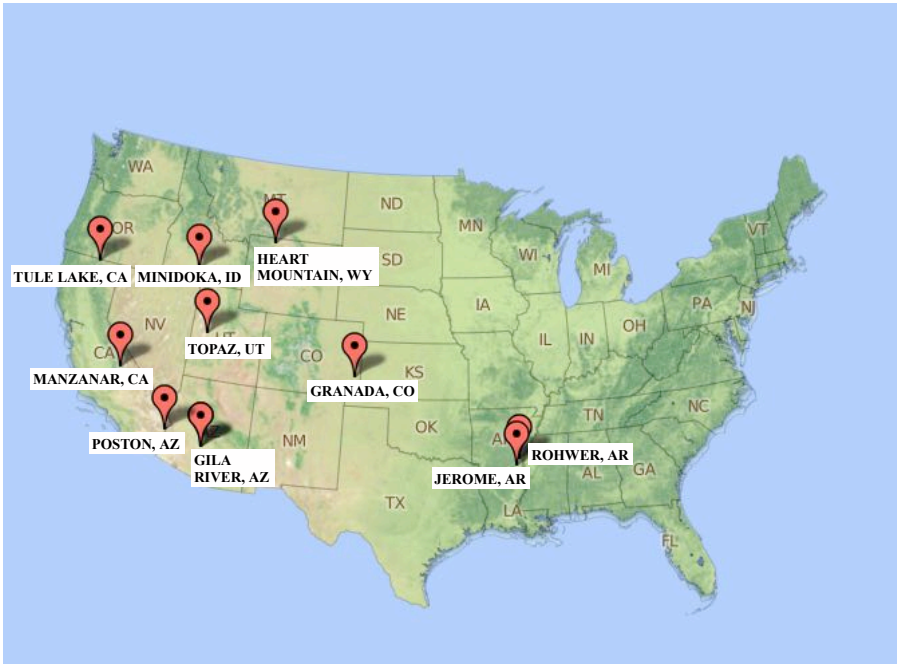
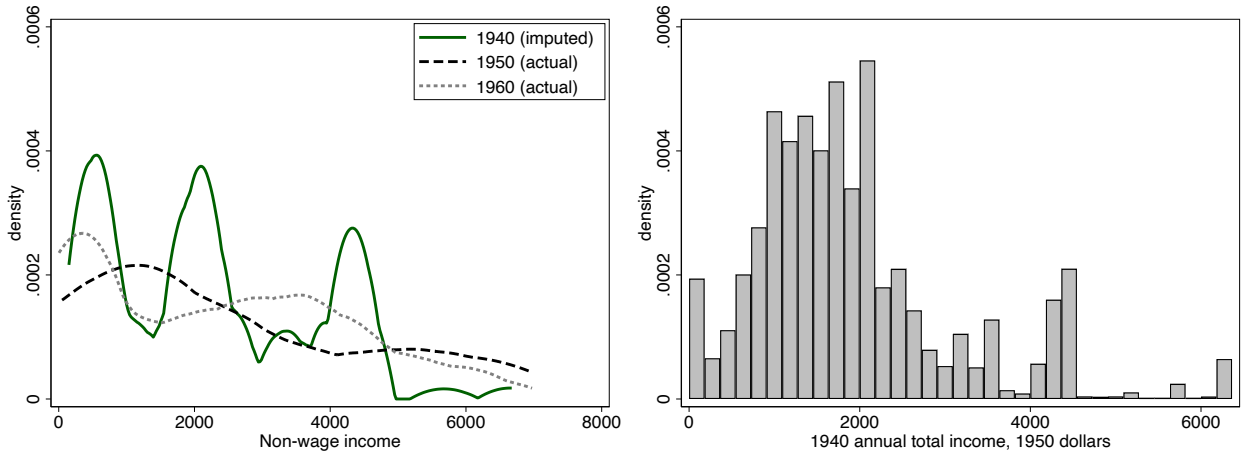


Figure A3: Diorama of Manzanar camp, CA

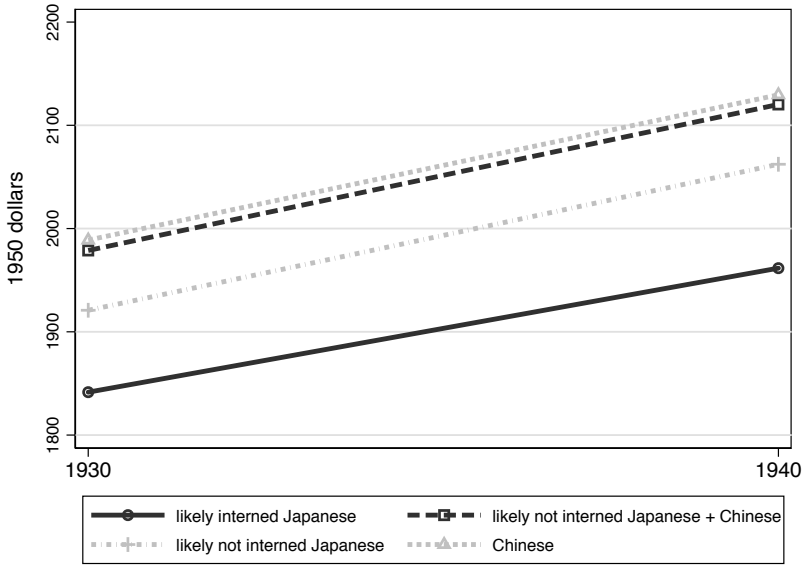
Note: Diorama created by Robert Y. Hasuike, Lance Matsushita, Dennis Masai, and Jerry Teshima. Japanese American National Museum (2017).

Figure A4: Non-wage income 1940, 1950, 1960; total income 1940



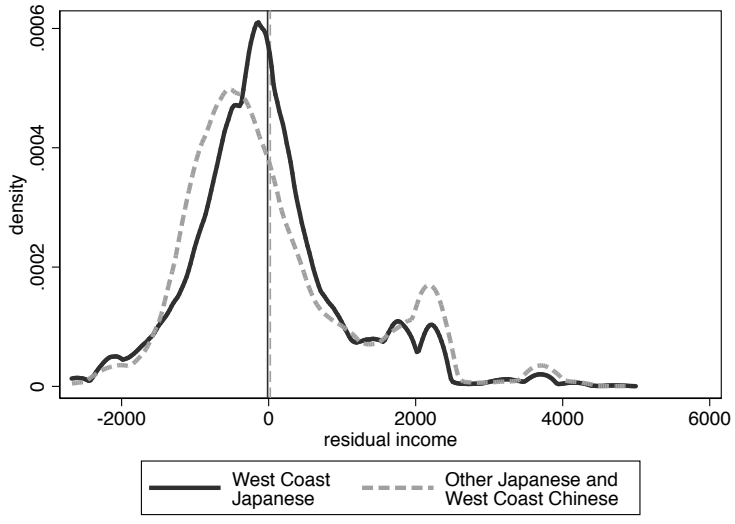
Note: Left panel: kernel density of non-wage income, separately for 1940, 1950, and 1960. In 1940, non-wage income is imputed as described in the main text. Right panel: distribution of total income (wage income plus non-wage income) in 1940. All income variables are in 1950 dollars. Census person weights are used. Sample in both panels: males, 1896-1924 birth cohorts who worked at least 26 weeks during the past year, Japanese in continental U.S. and Chinese in the West Coast (AZ, CA, OR, and WA). Left panel additionally restricts to those with non-zero non-wage income.

Figure A5: Occupational income score trends



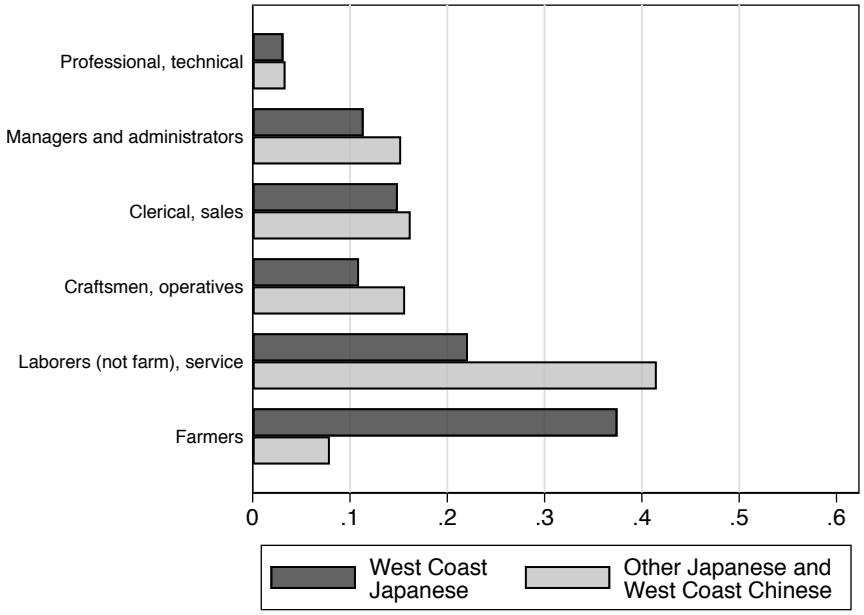
Note: Average occupational income score in 1950 dollars, by likelihood of internment. Likely interned are those Japanese with estimated probability of internment greater than .75. Not likely interned are those Japanese with estimated probability of internment less than .25. These two groups include 92 percent of the Japanese sample. Probability of internment estimated as explained in the text. Chinese residing in West Coast States (CA, WA, OR, and AZ). Census person weights are used. Males, employed, 1896-1924 birth cohorts in 1930, and 1940 Census.

Figure A6: Residual income distribution, 1940



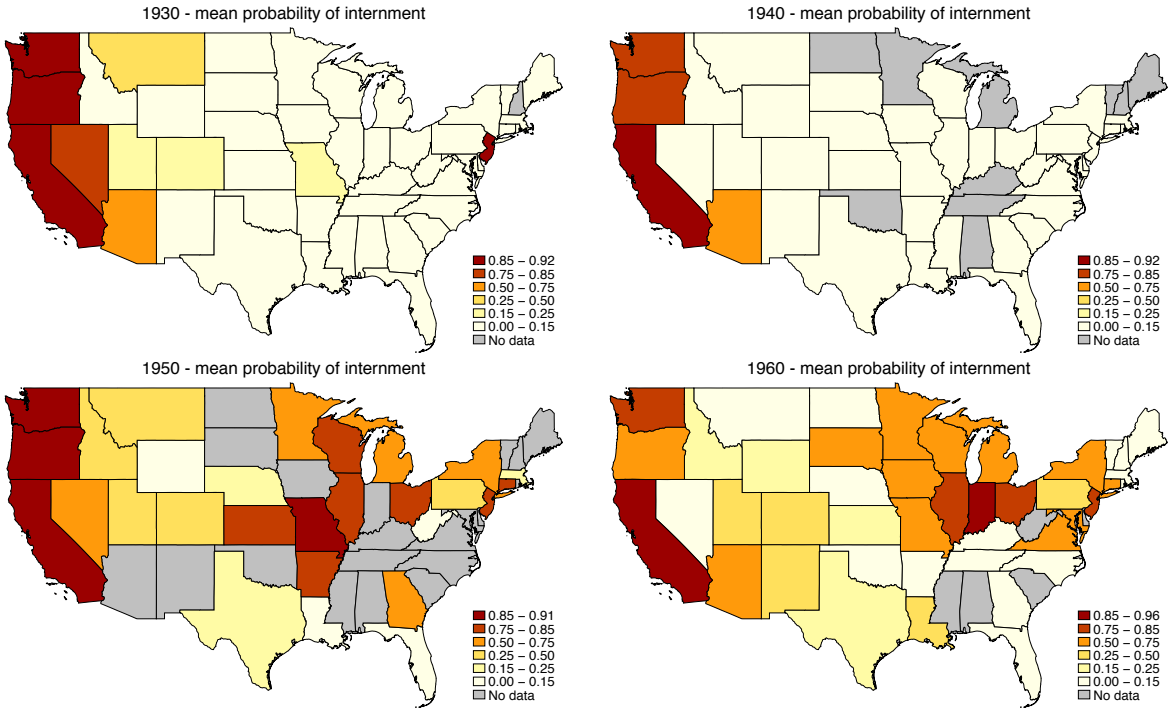
Note: Kernel density and average (vertical lines) of residual income in 1940 Census. Residuals from a regression of annual total income on birthplace dummies, a quadratic of age, and a high school completion dummy. Males, who worked at least 26 weeks during the year, born between 1896 and 1924. Census person weights are used. West Coast refers to California, Washington, Oregon, and Arizona. Other refers to remaining continental U.S.

Figure A7: Occupational distribution, 1940



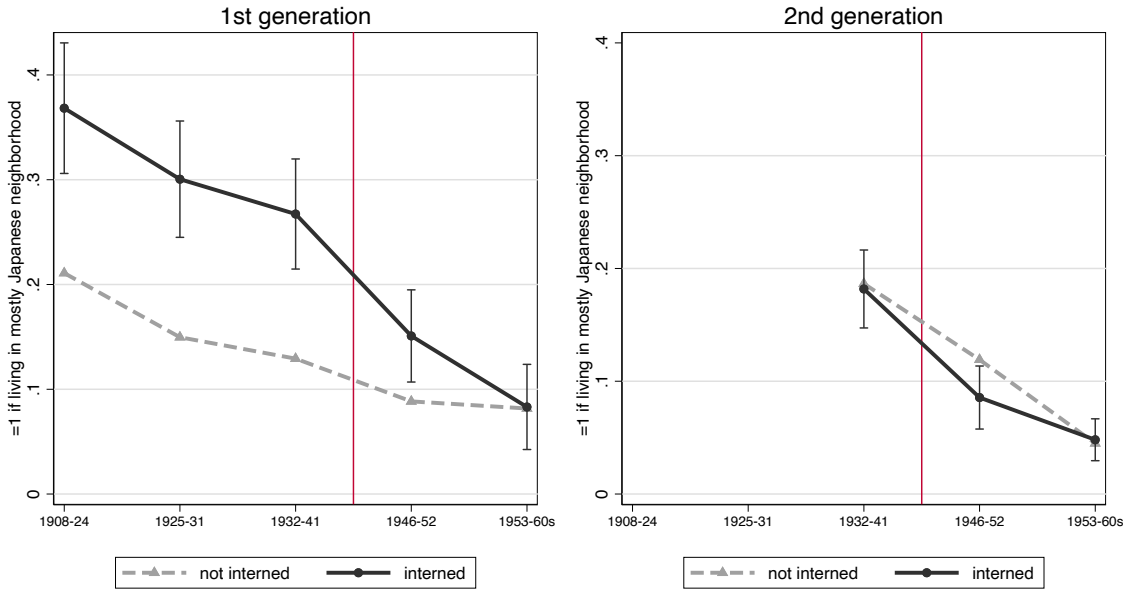
Note: Proportion of each group in each occupational category in 1940. Includes employed males, born between 1896 and 1924. West Coast refers to California, Washington, Oregon, and Arizona. Other refers to remaining continental U.S.

Figure A8: Mean probability of internment by state and Census year



Note: Average estimated probability of internment for individuals of Japanese origin in different Censuses and states of residence. Probability of internment estimated as explained in the text.

Figure A9: Residing in a Japanese neighborhood, interned and not interned Japanese Americans



Note: 1st and 2nd generation JARP respondents. Fraction who lived in a "mostly Japanese neighborhood" for interned and non-interned respondents at different points in time. 95% confidence intervals computed using robust standard errors from regressing a dummy for living in a Japanese neighborhood on an internment dummy.

Table A1: Camps' economic composition, comparison with 1940 Japanese Americans' neighborhood composition (Japanese neighbors)

		Education: some college or more		**Occupation: professional or managerial**		**Occupation: white collar (clerical, sales)**	
(1) CAMP	(2) POP.	(3) fraction of camp (adults)	(4) quantile in 1940 neighborhood distribution	(5) fraction of camp (adults)	(6) quantile in 1940 neighborhood distribution	(7) fraction of camp (adults)	(8) quantile in 1940 neighborhood distribution
Poston, AZ	18058	0.119	0.656	0.128	0.562	0.151	0.662
Tule Lake, CA	15074	0.108	0.610	0.107	0.529	0.129	0.621
Gila River, AZ	13158	0.116	0.642	0.137	0.577	0.138	0.633
Heart Mountain, WY	10919	0.127	0.674	0.200	0.682	0.165	0.706
Manzanar, CA	10151	0.109	0.617	0.148	0.585	0.180	0.718
Minidoka, ID	9515	0.112	0.634	0.210	0.703	0.161	0.700
Topaz, UT	8566	0.155	0.792	0.185	0.674	0.149	0.655
Jerome, AR	8475	0.103	0.570	0.133	0.566	0.140	0.633
Rohwer, AR	8409	0.092	0.509	0.168	0.644	0.149	0.655
Granada, CO	6916	0.142	0.760	0.155	0.588	0.182	0.719

Source: WRA internment camp records and 1940 Census full count.

Notes: Economic composition of WRA internment camps and comparison with that experienced by Japanese Americans in 1940 West Coast (WA, OR, CA, and AZ) neighborhoods, taking into account only Japanese persons in 1940 neighborhoods. (2)-Camp population in WRA records. (3)-Fraction of highly educated adult internees (educational attainment of some college or more). (4)-Fraction of West Coast Japanese Americans living in 1940 in a neighborhood with a lower share of highly educated Japanese adults than that in (3). (5)-Fraction of adult internees with previous professional or managerial occupations. (6)-Fraction of West Coast Japanese Americans living in 1940 in a neighborhood with a lower share of professional/managerial occupation Japanese adults than that in (5). (7)-Fraction of adult internees with previous white collar occupations (clerical, sales). (8)-Fraction of West Coast Japanese Americans living in 1940 in a neighborhood with a lower share of white collar occupation Japanese adults than that in (7). 1940 neighborhoods are groups of Census enumeration districts within a county as described in the text, with average population of 9,480 people.

Table A2: Effect of internment on income - DiD estimates excluding 1950

(a) Baseline

	CH + JP	CH only	JP only
	(1)	(2)	(3)
$\hat{\beta}$	473.83***	411.45***	476.89
	(139.38)	(141.79)	(333.83)
Education	no	no	no
Location	no	no	no
$\overline{Y}: int, post$	4894	4894	4894
% change	10.7	9.2	10.8
Observations	26890	25688	17502

(b) Education

	CH + JP	CH only	JP only
	(1)	(2)	(3)
$\hat{\beta}$	605.24***	569.87***	387.20
	(172.07)	(176.73)	(365.82)
Education	yes	yes	yes
Location	no	no	no
$\overline{Y}: int, post$	4729	4729	4729
% change	14.7	13.7	8.9
Observations	23882	22697	15256

(c) Location

	CH + JP	CH only	JP only
	(1)	(2)	(3)
$\hat{\beta}$	304.80**	300.06**	179.03
	(142.96)	(143.67)	(368.95)
Education	no	no	no
Location	yes	yes	yes
$\overline{Y}: int, post$	4894	4894	4894
% change	6.6	6.5	3.8
Observations	26890	25688	17502

(d) Education and location

	CH + JP	CH only	JP only
	(1)	(2)	(3)
$\hat{\beta}$	469.83***	479.88***	167.25
	(174.60)	(177.79)	(396.35)
Education	yes	yes	yes
Location	yes	yes	yes
$\overline{Y}: int, post$	4729	4729	4729
% change	11	11.3	3.7
Observations	23882	22697	15256

Note: Point estimates and bootstrap standard errors of the DiD coefficient of equation (6) in the text, varying the choice of comparison group and regressors. Using observations from 1940 and 1960. * 0.10 ** 0.05 *** 0.01. Dependent variable is annual total income in 1950 dollars. All specifications control for age and birthplace. Observations weighted by Census person weights. Education is a dummy variable controlling for high school completion. Location controls for time-invariant fixed effects of 5 U.S. partitions as described in the text. Males, 1896-1924 birth cohorts who worked at least 26 weeks during the past year. Specifications controlling for education exclude 1920-1924 birth cohorts. Columns (1) include Japanese in continental U.S. and Chinese in the West Coast (AZ, CA, OR, and WA). Columns (2) exclude Japanese with zero probability of internment. Columns (3) exclude Chinese. $\bar{Y}: int, post$ is average total income for internees in 1960. % change computed as $\frac{\hat{\beta}}{(\bar{Y}:int,post)-\hat{\beta}} \cdot 100$.

Table A3: Effect of internment on log income - DiD estimates

(a) Baseline

	CH + JP	CH only	JP only
	(1)	(2)	(3)
$\hat{\beta}$	0.1375*	0.1178	0.1649*
	(0.0733)	(0.0750)	(0.0976)
Education	no	no	no
Location	no	no	no
$\overline{Y} : int, post$	4433	4433	4433
% change	14.7	12.5	17.9
Observations	26271	25116	17015

(b) Education

	CH + JP	CH only	JP only
	(1)	(2)	(3)
$\hat{\beta}$	0.2400**	0.2244**	0.2335
	(0.1011)	(0.1037)	(0.1448)
Education	yes	yes	yes
Location	no	no	no
$\overline{Y} : int, post$	4213	4213	4213
% change	27.1	25.2	26.3
Observations	23333	22182	14830

(c) Location

	CH + JP	CH only	JP only
	(1)	(2)	(3)
$\hat{\beta}$	0.0992	0.0897	0.1463
	(0.0710)	(0.0743)	(0.0986)
Education	no	no	no
Location	yes	yes	yes
$\overline{Y} : int, post$	4433	4433	4433
% change	10.4	9.4	15.8
Observations	26271	25116	17015

(d) Education and location

	CH + JP	CH only	JP only
	(1)	(2)	(3)
$\hat{\beta}$	0.1989**	0.1937*	0.2257
	(0.0986)	(0.1025)	(0.1447)
Education	yes	yes	yes
Location	yes	yes	yes
$\overline{Y} : int, post$	4215	4215	4215
% change	22	21.4	25.3
Observations	23333	22301	14830

Note: Point estimates and bootstrap standard errors of the DiD coefficient of equation (6) in the text, varying the choice of comparison group and regressors. * 0.10 ** 0.05 *** 0.01. Dependent variable is log annual total income in 1950 dollars. All specifications control for age and birthplace. Observations weighted by Census person weights. Education is a dummy variable controlling for high school completion. Location controls for time-invariant fixed effects of 5 U.S. partitions as described in the text. Males, 1896-1924 birth cohorts who worked at least 26 weeks during the past year. Specifications controlling for education exclude 1920-1924 birth cohorts. Columns (1) include Japanese in continental U.S. and Chinese in the West Coast (AZ, CA, OR, and WA). Columns (2) exclude Japanese with zero probability of internment. Columns (3) exclude Chinese. $\bar{Y} : int, post$ is average total income for internees in 1950-60. % change computed as $(exp(\hat{\beta}) - 1) \cdot 100$.

Table A4: Effect of internment on wage income - DiD estimates

(a) Baseline

	CH + JP	CH only	JP only
	(1)	(2)	(3)
$\hat{\beta}$	471.93***	370.38***	443.76
	(142.57)	(141.81)	(390.18)
Education	no	no	no
Location	no	no	no
$\overline{Y}: int, post$	4059	4059	4059
% change	13.2	10	12.3
Observations	19248	18340	12004

(b) Education

	CH + JP	CH only	JP only
	(1)	(2)	(3)
$\hat{\beta}$	431.38**	350.17**	24.90
	(178.59)	(178.20)	(481.70)
Education	yes	yes	yes
Location	no	no	no
$\overline{Y}: int, post$	3670	3670	3670
% change	13.3	10.5	0.7
Observations	16931	16025	10309

(c) Location

	CH + JP	CH only	JP only
	(1)	(2)	(3)
$\hat{\beta}$	254.77*	220.10	494.83
	(149.89)	(145.63)	(439.90)
Education	no	no	no
Location	yes	yes	yes
$\overline{Y}: int, post$	4059	4059	4059
% change	6.7	5.7	13.9
Observations	19248	18340	12004

(d) Education and location

	CH + JP	CH only	JP only
	(1)	(2)	(3)
$\hat{\beta}$	209.67	190.94	120.73
	(189.28)	(182.56)	(524.06)
Education	yes	yes	yes
Location	yes	yes	yes
$\overline{Y}: int, post$	3670	3670	3670
% change	6.1	5.5	3.4
Observations	16931	16025	10309

Note: Point estimates and bootstrap standard errors of the DiD coefficient of equation (6) in the text, varying the choice of comparison group and regressors. * 0.10 ** 0.05 *** 0.01. Dependent variable is wage income in 1950 dollars. All specifications control for age and birthplace. Observations weighted by Census person weights. Education is a dummy variable controlling for high school completion. Location controls for time-invariant fixed effects of 5 U.S. partitions as described in the text. Males, 1896-1924 birth cohorts who worked at least 26 weeks during the past year and had positive wage income. Specifications controlling for education exclude 1920-1924 birth cohorts. Columns (1) include Japanese in continental U.S. and Chinese in the West Coast (AZ, CA, OR, and WA). Columns (2) exclude Japanese with zero probability of internment. Columns (3) exclude Chinese. $\bar{Y}: int, post$ is average total income for internees in 1950-60. % change computed as $(exp(\hat{\beta}) - 1) \cdot 100$.

Table A5: DiD estimates: =1 if worked for at least half of last year

	CH + JP	CH only	JP only
	(1)	(2)	(3)
Baseline	0.0050	-0.0012	-0.0104
	(0.0273)	(0.0284)	(0.0372)
Education	0.0095	-0.0057	-0.0273
	(0.0314)	(0.0323)	(0.0332)
Location	0.0027	0.0040	0.0008
	(0.0266)	(0.0280)	(0.0402)
Education and location	0.0004	-0.0072	-0.0086
	(0.0301)	(0.0317)	(0.0364)

Notes: Each cell corresponds to a different regression. Point estimates and bootstrap standard errors of the DiD coefficient of equation (6) in the text, varying the choice of comparison group. * 0.10 ** 0.05 *** 0.01. The dependent variable is a dummy that equals one if a person worked for at least half of the previous year (which determines inclusion into the main income regressions). All specifications control for age and birthplace. Observations weighted by Census person weights. Education is a dummy variable controlling for high school completion. Location controls for time-invariant fixed effects of 5 U.S. partitions as described in the text. Male, 1896-1924 cohorts. Specifications controlling for education exclude 1920-1924 birth cohorts. Column 1 includes Japanese in continental U.S. and Chinese in the West Coast (AZ, CA, OR, and WA). Column 2 excludes Japanese with zero probability of internment. Column 3 excludes Chinese.

Table A6: Intergenerational income correlation: OLS estimates

	Linear			Quadratic		
	(1)	(2)	(3)	(4)	(5)	(6)
parents' income	0.0946***	0.1266***	0.1177***	0.0920**	0.1344***	0.1259***
	(0.0343)	(0.0338)	(0.0337)	(0.0401)	(0.0390)	(0.0390)
parents' income × internment	-0.0541	-0.0687*	-0.0693*	-0.0620	-0.0808*	-0.0821*
	(0.0410)	(0.0405)	(0.0401)	(0.0475)	(0.0460)	(0.0452)
parents' income^2				0.0072	-0.0225	-0.0236
				(0.0361)	(0.0349)	(0.0346)
parents' income^2 × internment				0.0250	0.0354	0.0374
				(0.0431)	(0.0408)	(0.0392)
Internment	yes	yes	yes	yes	yes	yes
Demographics	no	yes	yes	no	yes	yes
Education	no	no	yes	no	no	yes
Clusters	651	651	651	651	651	651
Observations	1584	1582	1579	1584	1582	1579

Notes: Dependent variable is log annual family income at time of interview. JARP second generation respondents. Income computed as midpoint of reported income bracket. Parents' income also measured in JARP survey as midpoint of reported brackets. Parents' income residualized of age, internment, and year of interview effects. Internment equals one if respondent reports having been interned in a WRA camp. Demographic controls include sex of respondent and a quadratic in age. Education control is a dummy indicating high school attainment of respondent. Robust standard errors clustered at the family (parent) level. * 0.10 ** 0.05 *** 0.01.

B Japanese American Research Project: Representativeness

In the "Data" section in the text I summarize the sampling procedure of the Japanese American Research Project (JARP) surveys. I refer the interested reader to Levine and Rhodes (1981) who describe the survey in detail. Their book includes descriptions of the sampling procedure and how representative is the sample of the entire Japanese American population up until that time.

In terms of sample representativeness, Levine and Rhodes (1981) caution that those Issei with the least connections to the community were more likely to be left out of the comprehensive list from which Issei were sampled. In addition, Nisei and Sansei descendants of the eldest Issei (those families in which husband and wife had both died by the early 1960s) were excluded from the survey. In spite of these potential issues, they express their assurance in the quality of the sample: *"it is good enough [...] to enable to draw some tentative conclusions about processes among the Japanese Americans* (p.23)."

I provide some additional information on the representativeness of the JARP sample by comparing it to Japanese Americans in the 1960 Census sample. The timing does not completely align since the JARP surveys were carried out between 1963–1967. Based on this I focus on comparing immutable characteristics (place and time of birth), and state of residence (not expected to change dramatically during the 1960s since post-internment migration had stabilized by then).

The results from this comparison, shown in Appendix Table B1, are reassuring. At the very least they rule out glaring disparities between the JARP sample and the Census. The first part of Appendix Table B1 reports the percentage of each sample residing in the four states targeted for internment (California, Washington, Oregon, and Arizona) and the three states outside of those initial four where more Japanese people resided in 1960 (Illinois, New York, and Colorado). The percentage of Japanese Americans in each state align pretty well across the two samples. For instance, 64.1% of Japanese Americans in the 1960 Census were living in California with the corresponding JARP number being 64.74% . For Colorado, with a much lower share of Japanese Americans, the numbers are respectively 2.64% and 2.22%. The largest disparity shows up in New York where the corresponding numbers are 3.67% and 1.33%.

The second part of Appendix Table B1 shows that the percentage of US-born is rather comparable: 72% in the Census and 75% in JARP. Finally, the third part of Appendix Table B1 compares the time-of-birth distribution. While there are some differences between the two (as Levine and Rhodes (1981) suggested) they are arguably not very large. Overall, Levine and Rhodes (1981) original representativeness claim above seems a reasonable one.

Table B1: JARP representativeness: Comparison with Japanese Americans in 1960 Census

	1960 Census	**JARP**
Place of residence (%)		
California	64.10	64.74
Washington	7.31	6.57
Oregon	1.89	1.42
Arizona	.43	.8
Illinois	5.85	6.22
New York	3.67	1.33
Colorado	2.64	2.22
Born in the US (%)	71.58	74.97
Birth cohort (%)		
1896-1901	11.89	14.81
1902-1907	11.72	9.94
1908-1913	10.72	8.52
1914-1919	27.36	31.85
1920-1924	38.31	34.89

Notes: State of residence, fraction born in the US, and birth cohort group of Japanese Americans in 1960 Census (continental US) and JARP survey respondents. 1896-1924 birth cohorts. JARP survey was conducted between 1963–1967.

C Additional Insights into the Internment Prediction Assumption

In the section "Empirical Approach" in the main text, equation (3) lays out an assumption that is necessary in order to predict past internment status in 1950 and 1960 Census data. This assumption sates that, conditional on state of residence in 1940, state of residence in 1950 and 1960 does not impact the probability of internment:

$$\mathbf{E}(I_i|Z_i, s_i^{40}, s_i^t) = \mathbf{E}(I_i|Z_i, s_i^{40}), \quad t = 1950, 1960$$

Note that this assumption does not restrict meaningful migration behavior in any way. Rather, this is an assumption about the effectiveness of the government's internment policy, how the policy targeted some states and not others, and "compliance" with the policy within the targeted states. A simple example building on equation (3) illustrates why this is the case.

Example on the Internment Prediction Assumption

For simplicity in this example I abstract from demographics Z_i, I use as example states California and Illinois, and focus on the "post" year 1960. The main force of the assumption does not depend on conditioning on Z_i. California (CA) was a state targeted for internment while Illinois (IL) was not. Further, many former internees migrated to Illinois after internment.

The assumption in equation (3) implies the following:

$$Pr(I_i = 1|s_i^{40} = \text{CA}, s_i^{60} = \text{IL}) = Pr(I_i = 1|s_i^{40} = \text{CA}, s_i^{60} = \text{CA}) \tag{C1}$$

That is, as long as two different Japanese Americans both resided in California in 1940, the probability that they are former internees is the same regardless of whether in 1960 they reside in California or in Illinois. Equations (C2) and (C3) below express the same intuition in a different way.

Using Bayes' rule, equation (C1) is equivalent to

$$\frac{Pr(s_i^{40} = \text{CA}, s_i^{60} = \text{IL}|I_i = 1)}{Pr(s_i^{40} = \text{CA}, s_i^{60} = \text{IL})} = \frac{Pr(s_i^{40} = \text{CA}, s_i^{60} = \text{CA}|I_i = 1)}{Pr(s_i^{40} = \text{CA}, s_i^{60} = \text{CA})} \tag{C2}$$

We can further expand equation (C2) and, simplifying common terms on both sides of the equality, reach the condition

$$\frac{Pr(s_i^{60} = \text{IL}|s_i^{40} = \text{CA}, I_i = 1)}{Pr(s_i^{60} = \text{IL}|s_i^{40} = \text{CA})} = \frac{Pr(s_i^{60} = \text{CA}|s_i^{40} = \text{CA}, I_i = 1)}{Pr(s_i^{60} = \text{CA}|s_i^{40} = \text{CA})} \tag{C3}$$

Equation (C3) illustrates that a sufficient condition for the assumption in equation (3) to hold is:

$$Pr(I_i = 1|s_i^{40} = s) \in \{0, 1\} \quad \forall s$$

That is, a sufficient condition for the assumption to hold is perfect compliance across states that were or were not targeted for internment. The historical background together with the evidence in Figure 2 (comparing counts of Japanese Americans across states in the 1940 Census and the WRA records) indicate that this is a plausible approximation of reality.[1]

[1] To the extent that there are small departures from perfect compliance, one could consider my estimates as having an Intent-to-Treat interpretation: capturing the effect of being *targeted* for internment. In any case, based on the historical evidence and the comparison of 1940 Census and WRA data, being targeted for internment and being interned was, to a very close approximation, one and the same.

D Sample Stability and Endogenous Attrition

Sample stability is a potential concern arising from the lack of panel data. An issue would arise if during the time period of study, selective in- or out-migration took place in ways that jeopardized my difference-in-difference (DiD) strategy.

International in-migration

With respect to international in-migration, I believe this should be less of a concern due to the restrictive migration laws of the time. Asian migration was completely shut off with the Immigration Act of 1924, making the Japanese and Chinese Americans still present in the country in 1940 likely to be those that had established in the country for the long run. It was not until the Immigration Act of 1952 was passed that very small quotas were assigned for Asians (see Appendix Figure A1). In order to exclude potential recent migrants after internment, the DiD sample drops people in the 1950 Census who were Asian-born and declare living in Asia one year ago. In the 1960 sample, I exclude those people who were born abroad and were living abroad 5 years ago.

Sample stability in observables

Appendix Figure D1 provides a sense of the stability of the DiD sample in terms of immutable observable characteristics, separately for Japanese Americans and West Coast Chinese Americans. The three samples stay relatively stable in terms of time and place of birth. Difference in means between 1950–60 and 1940 are mostly not statistically significant, although the confidence intervals for the 1950 1% sample are somewhat wide. If anything, the sample becomes slightly younger. This could be due to mortality, and out-migration. I discuss the latter in turn.

Migration to Japan due to internment, and DiD "worst-case" robustness

Some might worry that the average positive effect of internment on long-run incomes is driven by selective migration to Japan after 1945. Indeed, if many decided to migrate to Japan because of internment, and these people were negatively selected in terms of earnings potential, we could expect to find a spurious positive estimate.

However, the historical circumstance arguably reduces this type of concern. Because of strict immigration laws described above, interned Japanese Americans were either born in the US (around 65% of internees), or had been living in the country for at least 18 years at the time of internment. Thus, internees had a strong attachment to the U.S., making migration to Japan arguably less likely. Moreover, post-WWII Japan was a devastated country, with severe shortages, and occupied by allied forces (mostly U.S. and British).

Historical accounts provide some information on the number of Japanese Americans that left for Japan following internment. Daniels (2004) quantifies it in a total of 4,724 people (around 4% of internees). Out of this total, 1,659 were Issei, 1,949 were Nisei minors accompanying their parents, and 1,116 were adult Nisei. The historical literature explains how the main motivations for those who left were non-economic: anger toward the U.S. and national pro-Japanese sentiment. This aligns with the dire economic conditions in Japan. Moreover, it arguably reduces the concern that those who left were the ones with differentially bad economic prospects in the U.S. In any case, I next perform an empirical exercise designed to understand how the DiD results would fare in a "worst-case" scenario—not necessarily a *likely* scenario—of very negatively-selected migration.

"Worst-case" robustness exercise using placebo observations

Using the figures provided by Daniels (2004), I perform an exercise designed to assess whether the DiD estimates are robust to very negatively-selected migration induced by internment. The approach consists of adding "missing", or "placebo", observations of internees to the *post* sample (1950 and 1960), assigning them low levels of income, and checking how does the DiD estimate change. This "worst-case scenario" approach is similar in spirit to bounding exercises in Lee (2009) and Horowitz and Manski (2000). Note that the exercise is not meant to capture what is the "right" parameter, but to understand the properties of the DiD approach in a "worst-case" scenario of heavily-selected out-migration.

I begin by considering the 1,388 male adult internees who left to Japan according to Daniels (2004).[2] I then make a series of conservative assumptions. First, I assume that these adults were *all* in the 1896-1924 birth cohorts that compose the DiD sample. Second, I assume that all who left did so *because of* internment and would not have done so otherwise. These assumptions imply adding all 1,388 people as "placebo" observations to the *post* sample. Since the 1950 and 1960 Census samples have, respectively, a 1% and 5% coverage, I add 14 and 70 "placebo" observations to the 1950 and 1960 samples, respectively. These numbers are small because the number of people who left was small, and because the Census sample coverages are relatively low. In any case, these "placebo" observations are assigned Census person weights in the DiD estimation (like all other observations).

Appendix Figure D2 reports DiD coefficients estimated using the sample with added "placebo" *post* observations, with varying levels of low income and predicted internment probability. The comparable point estimate from Table 3 in the text is 563.92.[3] The horizontal axis in Appendix Figure D2 assigns varying income levels to "placebo" observations: different below-median percentiles of the 1950- and 1960-specific income distribution of Japanese Americans. The vertical axis assigns varying predicted probabilities of internment to "placebo" observations: from 0.5 to 1.[4]

Appendix Figure D2 suggests that the positive effect of internment on income is rather robust even to very dramatic forms of negatively-selected sample attrition. Not even in the worst scenario—in which all migrants are assigned the 5th income percentile and a predicted internment probability of 1—do we get a negative point estimate. Positive, statistically and economically significant estimates are still found under severely-selected scenarios of sample attrition: assigning all migrants the 10th percentile of the income distribution and an estimated probability of internment of 0.9 results in an estimate of 306.72, statistically significant at the 5% level.

Overall this exercise—together with the historical evidence—suggests that, even under conservative (and arguably implausible) assumptions, the estimated positive effects of internment are unlikely to be driven by negatively selected migrants to Japan.

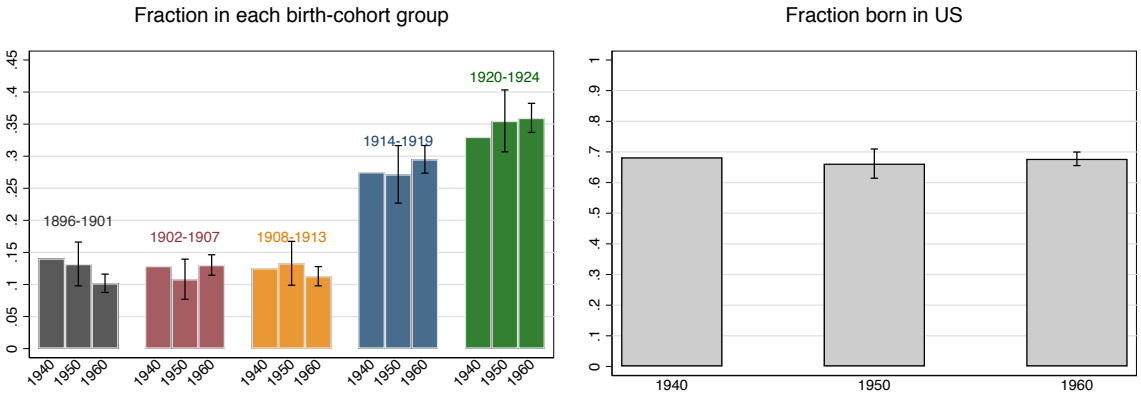
[2] I assume men and women migrants are split 50-50.

[3] I focus on the baseline specification since additional covariates would make the procedure more complicated and lead to an increased number of implementation choices.

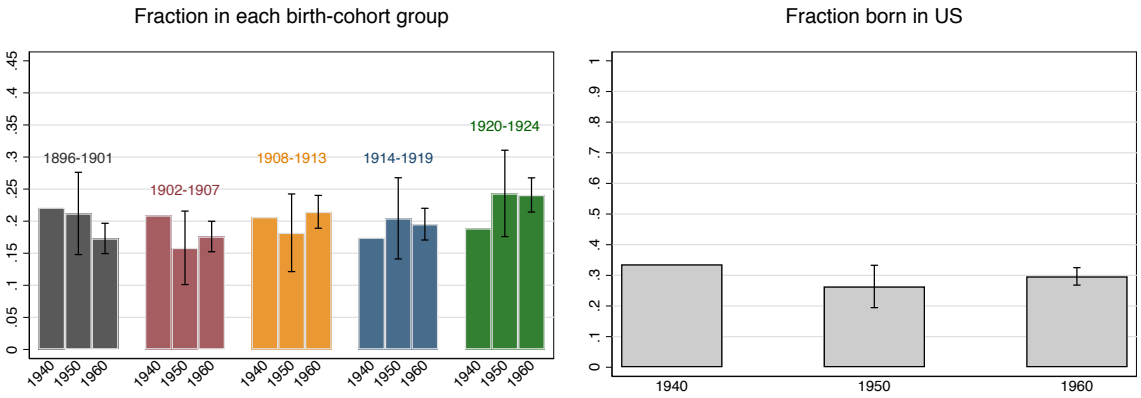
[4] Note that a predicted probability of 1 does not systematically arise in the "true" DiD sample, making estimates with probability equal to 1 not only "worst-case" but also specially implausible.

Figure D1: Sample stability: 1896–1924 birth cohorts in the 1940, 1950, and 1960 Censuses

(a) Japanese

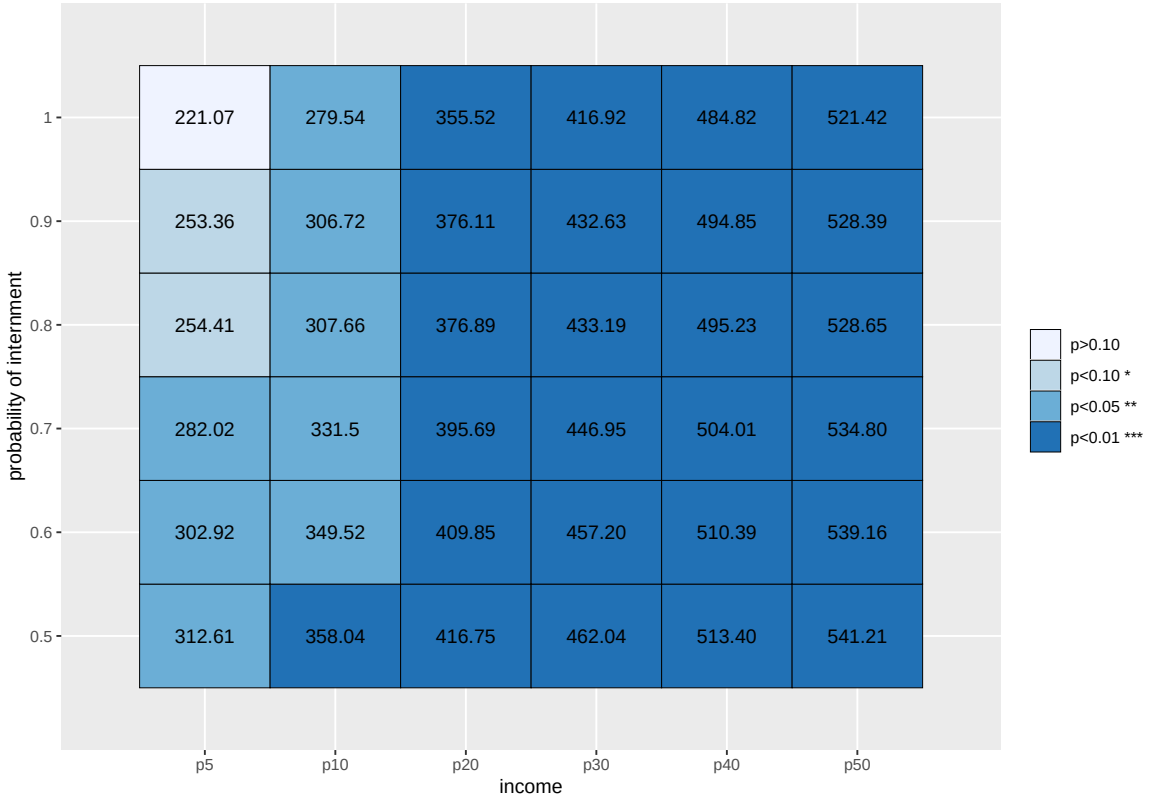


(b) West Coast Chinese



Note: Distribution of time-invariant characteristics of Japanese American and West Coast Chinese American men from the 1896–1924 birth cohorts (cohorts from the diff-in-diff analysis) in the 1940 Census (full count), 1950 Census (1% sample), and 1960 Census (5% sample). The first figures on each row show the fraction of people from each Census year who belong to any given birth-cohort group. The second figures on each row show the fraction of people from each Census year who were born in the continental US. Means for the 1950 and 1960 samples include a 95% confidence interval.

Figure D2: "Worst-case" migration scenario: DiD effects under different placebo movers' income and internment probability



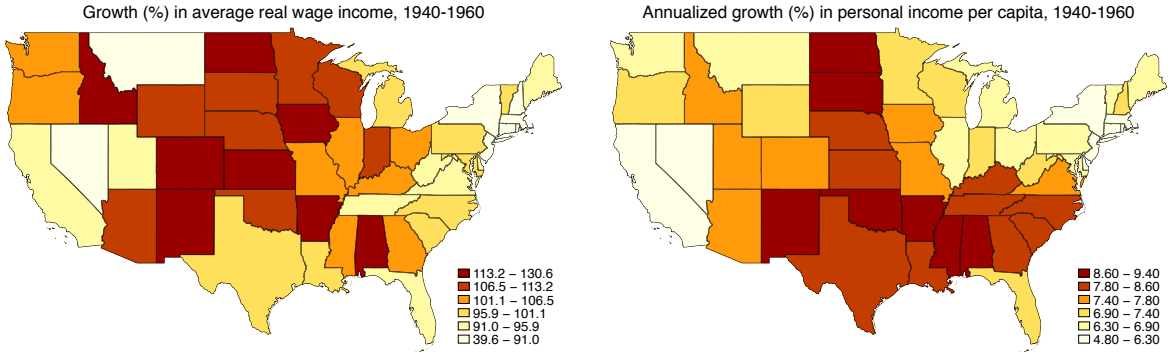
Note: Point estimate and statistical significance of the DiD coefficient from equation (6) in the text when adding to the "post" sample placebo movers to Japan with differing income and probabilities of internment. Estimates corresponding to Baseline, CH+JP specification in Table 3 (original point estimate equal to 563.92). Number of movers added to the sample match those who left to Japan after internment according to Daniels (2004). Income of placebo movers include different percentiles of the 1950- and 1960-specific income distribution of the Japanese original DiD sample.

E Smart Moves?

Did internees who changed their state of residence after internment make "smart moves"? The postwar period was one of economic prosperity, but some places experienced greater growth than others. While movers who re-optimized could have increased their earnings even when moving from more to less generally prosperous places (e.g. Nakamura et al., 2020), it is interesting to check whether former internees who moved did so to areas of the country that turned out to experience greater growth than the ones they left behind. Shoag and Carollo (2016) document how geography mattered in determining the relative prospects of different internees.

I construct two measures of state-level economic growth between 1940–1960. The first is the growth in average real wage income between 1940 and 1960. I construct this measure using Census microdata from 1940 and 1960. The second measure, from the Bureau of Economic Analysis, is the state-level annualized percentage growth in personal income per capita between 1940–1960. Appendix Figure E1 shows the distribution of these two measures across states. Between 1940–1960 the average state roughly doubled its real average wage income and experienced an average growth in personal income per capita of 7.4% per year. The correlation between these two measures of state-level income growth is 0.71.

Figure E1: State-level growth in incomes, 1940–1960



Note: Left panel displays the state-level growth in average real wages between 1940–1960 (IPUMS Census data). The right panel displays the state-level compounded annual growth rate in personal income per capita between 1940–1960 (Bureau of Economic Analysis). The correlation between these two measures of state-level income growth is 0.71.

How did the states that former-internee movers go to fare during the postwar boom in comparison to the places they left behind? Appendix Table E1 answers this for those who were living in California before internment and settled elsewhere afterwards (83% of internees were previously living in California). Appendix Table E1 shows that, according to these measures, California did not boom as much between 1940–1960 when compared to the five most popular places these former internees moved to (Illinois, Ohio, Colorado, Utah, and Michigan). In the table, California features the lowest per-capita income growth and the second-to-lowest growth in average wage income.

Appendix Table E2 now considers all former-internee movers and all destinations. It computes the (mover-weighted) average income growth between 1940–1960 in the states that movers went to and the ones they left behind. In the aggregate the same pattern as in the California example arises. The places former-internee movers were living before WWII experienced less of a postwar boom than the ones they went to after internment.

Table E1: Income growth 1940–1960 in top 5 destinations for former-internee movers who were previously living in California

(1) **state**	(2) % **who moved to state**	(3) $\Delta\bar{w}_{1960,1940}$ (%)	(4) $\Delta\bar{Y}_{1960,1940}$ (%)
Illinois	32.74	101.6	6.6
Ohio	10.32	101.2	6.7
Colorado	8.93	119.7	7.8
Utah	7.74	93.1	7.7
Michigan	6.55	97.8	6.5
California	—	95.9	6.3

Notes: Column (1) lists the five top destinations of former internees who before internment lived in California and who moved to another state afterward (JARP survey data). Column (2) shows the percentage of this group of movers who went to each of the states in column (1) (JARP survey data). Column (3) displays the state-level growth in average real wages between 1940–1960 (IPUMS Census data). Column (4) displays the state-level compounded annual growth rate in personal income per capita between 1940–1960 (Bureau of Economic Analysis). Numbers for California are shown for comparison.

Table E2: Average 1940–1960 growth in former and new states of residence

	$\Delta\bar{w}_{1960,1940}$ (%)	$\Delta\bar{Y}_{1960,1940}$ (%)
State after move	101.4	6.9
Pre-internment state	98	6.5

Notes: For those who were interned and changed states of residence before and after internment, this table computes the average 1940–1960 growth in incomes of the states they left behind and the ones they went to. $\Delta\bar{w}_{1960,1940}$ is the state-level growth in average real wages between 1940–1960 (IPUMS Census data). $\Delta\bar{Y}_{1960,1940}$ is the state-level compounded annual growth rate in personal income per capita between 1940–1960 (Bureau of Economic Analysis). State averages weighted by number of people that moved from and to each state.

F Evidence on Other Mechanisms

Increased labor supply or work effort

Given the asset and income losses that internees experienced during internment, it is plausible that they increased their work effort and labor supply in order to make up for these losses.[5] While such a response would be consistent with the positive effect on incomes, one could think that this mechanism was more likely in the immediate aftermath of internment, but less so 5 and 15 years afterward.

I check whether the data supports this hypothesis in two different ways using JARP and the Census. JARP Issei respondents were asked whether they had ever taken a vacation for more than a weekend. The second row of Appendix Figure F2 compares the responses of former internees and non-internees. Both groups present rather similar probabilities of ever having taken a vacation. If anything, former internees were slightly more likely to have done so.

Next, I use Census data on hours and weeks worked and apply the DiD strategy from equation (6) in the main text to test for the presence any positive effects on labor supply. Appendix Table F1 shows the results of such exercise by specification, comparison group, and dependent variable. Columns 1-3 show the DiD coefficient β estimate and standard error for Census question of hours worked last week. Columns 4-6 do the same when using as dependent variable weeks worked last year.[6] Results on hours worked are positive but small (on the order of 0.3 - 2 hours per week) and the majority are not statistically different from zero. Results on weeks worked are however mostly negative and not very stable when varying the comparison group. Negative coefficients have magnitudes between -1.5 and -2. When only using non-interned Japanese as control, coefficients are positive but not significantly different from zero.

Note that these DiD results should be interpreted with caution, since labor supply is noisily reported in the Census, and it is hard to asses the parallel trends assumption for these dependent variables. However, these results together with JARP survey responses do not suggest that increased labor supply or work effort might have played a big role in explaining the long-term positive income effect of internment.

Attitudes toward work

Could it be that the unconventional labor market institutions in place during internment led internees to change their attitudes towards work in different ways than that reflected in labor supply? I use JARP Nisei responses to several questions to address this possibility. Rows 3-6 of Appendix Figure F2 show that former internees and non internees were equally likely to agree with the statement that effort pays off, with the importance of living for the present, the assertion that Americans place too much stress on occupational success, and that how money is made is more important than how much is made. This evidence suggests that internment did not affect long-run attitudes toward merit, work, or occupational status.

[5] The data do not allow me to quantify the amount of asset losses. However, I can study home ownership as a related statistic. Appendix Figure F1 shows the evolution of home ownership for Issei JARP respondents, separately by whether they were interned or not. Both groups show the same evolution before internment, interned are 10pp (relative to a baseline of 40%) less likely to own their house between 1946-1952. By 1953-mid1960s, however, they have caught up in this margin and once again show a similar home ownership rate.

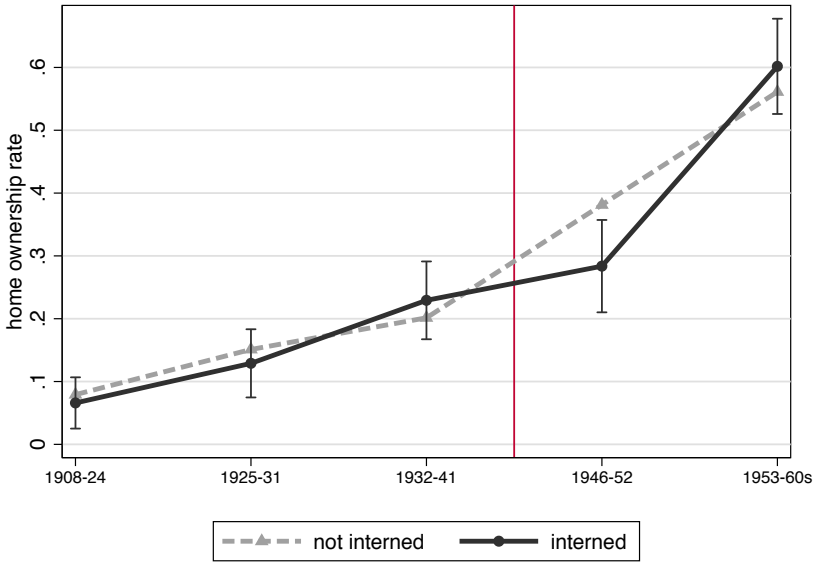
[6] Both hours worked last week and weeks worked last year are reported in intervals in Census data for this period. I assign each respondent the midpoint of their interval in order to estimate these regressions.

Attachment to Japan and Japanese language

Finally, one might think that mass internment could alter in some way the preferences of individuals over cultural and identity aspects, which somehow translate into employment and migration decisions. To test this hypothesis I compare assimilation measures of internees and non-internees in the JARP survey.

The first row of Appendix Figure F2 shows that former internees and non-internees were equally likely to work for/with other Japanese Americans. The top-left panel of Appendix Figure F3 displays the answers of a JARP question which asked Issei respondents to state how American versus how Japanese they felt. The distribution of answers of Issei internees practically coincides with that of non-interned respondents. The top-right panel of Appendix Figure F3 shows the probability that an Issei respondent had obtained American citizenship by the time of the survey.[7] Non-interned Issei were more likely to have become naturalized (68% vs. 55%). However, assuming that citizenship is associated with better labor market prospects, the sign of this difference is not consistent with explaining the positive income effect of internment. Finally, the bottom-left panel of Appendix Figure F3 makes use of JARP third generation respondents (the Sansei). It plots the proportion of them who speak Japanese, separately by whether their grandparent was interned or not. The fraction of Sansei who speak Japanese, around 11%, is exactly the same for the two subgroups.

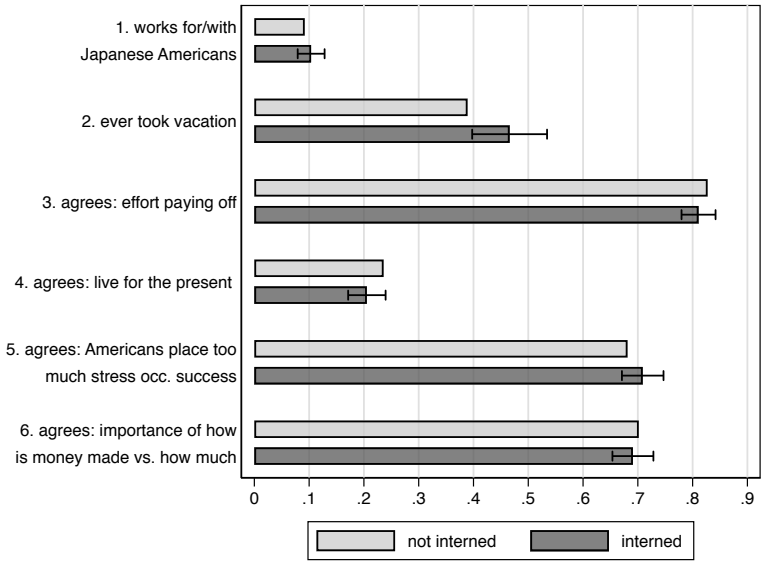
Figure F1: Home ownership rate, interned and not interned Japanese Americans



Note: 1st generation JARP respondents. Home ownership rate for interned and non-interned respondents at different points in time. 95% confidence intervals computed using robust standard errors from regressing a dummy for home ownership on an internment dummy.

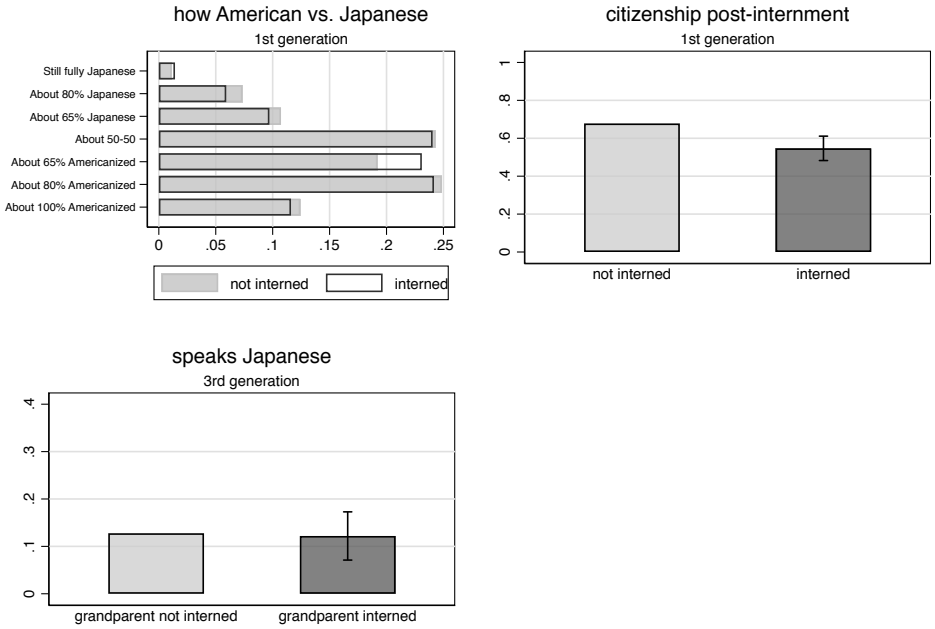
[7] First generation Japanese Americans became eligible for naturalization with the Immigration Act of 1952.

Figure F2: Work characteristics and attitudes



Note: Questions 1, 3, 4, 5, and 6: 2nd generation JARP respondents. Question 2: 1st generation JARP respondents. Q1 equals 1 if self-employed and reports most clients are of Japanese ancestry or if salary worker and works for Japanese or Japanese American employer. Q2: *"Did you or your wife (husband) ever take off from work for more than a week-end for a vacation with your family?"*. Q3: *"If you try hard enough you usually get what you want."*. Q4: *"Nowadays a person has to live pretty much for today and let tomorrow take care of itself."*. Q5: *"Americans put too much stress on occupational success."*. Q6: *"Even today, the way you make money is more important than how much you make."*. 95% confidence intervals computed using robust standard errors from regressing each dummy dependent variable on an internment dummy.

Figure F3: Attachment to Japan and Japanese language



Note: How American vs. Japanese survey question stated that 100% Americanized would correspond to *"[...] an Issei who has become completely American in his dress, eating habits, recreation, and all other aspects of his life."* First generation Japanese Americans became eligible for naturalization with the Immigration Act of 1952. 95% confidence intervals computed using robust standard errors from regressing each dummy dependent variable on an internment dummy.

Table F1: DiD estimates: Hours and weeks worked

	Hours worked			Weeks worked		
	CH + JP	CH only	JP only	CH + JP	CH only	JP only
	(1)	(2)	(3)	(4)	(5)	(6)
Baseline	0.53	0.52	0.29	-1.41	-1.65*	1.11
	(0.81)	(0.83)	(1.50)	(0.89)	(0.91)	(1.63)
Education	1.89*	1.93*	1.65	-1.58	-1.96	1.90
	(1.02)	(1.04)	(1.59)	(1.17)	(1.21)	(2.36)
Location	0.95	0.92	1.63	-1.34	-1.58*	0.87
	(0.81)	(0.84)	(1.53)	(0.88)	(0.91)	(1.64)
Education and location	2.25**	2.29**	2.67*	-1.59	-2.01	1.66
	(1.00)	(1.04)	(1.53)	(1.22)	(1.24)	(2.26)

Notes: Each cell corresponds to a different regression. Point estimates and bootstrap standard errors of the DiD coefficient of equation (6) in the text, varying the choice of comparison group and regressors. * 0.10 ** 0.05 *** 0.01. In columns 1-3 the dependent variable is hours worked last week (week prior to each year's Census). In columns 5-6 the dependent variable is weeks worked last year. Both hours and weeks in the Census are originally intervalled (WKSWORK2 and HRSWORK2). I assign each individual the midpoint of his hours/weeks interval. All specifications control for age and birthplace. Observations weighted using person weights. I include observations with dependent variable greater than zero. Education is a dummy variable controlling for high school completion. Location controls for time-invariant fixed effects of 5 U.S. partitions as described in the text. Male, 1896-1924 cohorts. Specifications controlling for education exclude 1920-1924 birth cohorts. Columns 1 and 4 include Japanese in continental U.S. and Chinese in the West Coast (AZ, CA, OR, and WA). Columns 2 and 5 exclude Japanese with zero probability of internment. Columns 3 and 6 exclude Chinese.

G Model of Occupational Choice: Evolution of Occupational Barriers

I borrow and adapt a logistic model of occupational choice from Hsieh et al. (2013) (published as Hsieh et al., 2019) which features group-occupation specific frictions. Through the lens of this model, I am able to interpret observable statistics of the occupation and income distributions as the barriers that each group (internees vs. non-internees) faced when accessing different occupations. I compute these model-implied frictions in Census data before and after the internment episode, and study the evolution of barriers faced by internees relative to non-internees in accessing different occupations. Empirical results are presented in the section "Model-Based Measures of Occupational Barriers" in the paper. The following model description is based on Hsieh et al. (2013).

Setup

There is a population of individuals and each belongs to one of two different groups g: interned Japanese Americans, or non-interned Japanese Americans and Chinese. There are N possible occupations, one of which is the home sector. Individuals differ in their occupation-specific abilities. Each individual randomly draws a vector of occupational abilities $(\epsilon_1, \epsilon_2, ..., \epsilon_N)$ from the following extreme value distribution:

$$F(\epsilon_1, \epsilon_2, ..., \epsilon_N) = \exp\Big\{ - \big[\sum_{j=1}^{N} T_j \epsilon_i^{-\theta} \big]^{1-\rho} \Big\} \tag{G1}$$

The parameter ρ is related to the correlation of skills for an individual, while θ is related to the same correlation and the overall dispersion of skills.[8]

Each individual derives utility from consumption c and leisure $(1-s)$ according to the utility function

$$u(c, s) = c^{\beta}(1-s) \tag{G2}$$

where c is consumption, s is time spent on human capital accumulation, and β governs the tradeoff between the two.

Each individual works one unit of time in his occupation of choice j. In a pre-period, the individual makes the choice of how much time to devote to human capital accumulation h. This is done by combining time s and educational inputs e according to the following function:

$$h(e, s) = s^{\phi_j} e^{\eta} \tag{G3}$$

where the elasticity of human capital with respect to time invested, ϕ_j, varies across occupations and η represents the elasticity with respect to educational inputs.

Individuals' decisions are distorted by frictions that vary across occupations j and groups g. They come in two different forms: τ_{jg}^{w} is a labor market friction that acts as a tax on earnings for individuals of group g employed in occupation j. It can be interpreted as an occupation-group specific form of wage discrimination.

On the other hand, τ_{jg}^{h} represents a human capital friction. It acts as a barrier that makes it harder for individuals in group g to acquire human capital to work in occupation j. It comes in the form of a mark-up on educational expenditures and it can broadly be inter-

[8] Following Hsieh et al. (2013), the expression in equation G1 is actually a re-parametrization of the actual distribution which makes notation more manageable. The actual distribution is $F(\epsilon_1, \epsilon_2, ..., \epsilon_N) = \exp\Big\{ - \big[\sum_{j=1}^{N} (\tilde{T}_j \epsilon_i^{-\tilde{\theta}})^{\frac{1}{1-\rho}} \big]^{1-\rho} \Big\}$, and $\theta \equiv \tilde{\theta}/(1-\rho)$ and $T_g \equiv \tilde{T}_g^{\frac{1}{1-\rho}}$.

preted as barriers that prevent individuals from acquiring the skills or information that are relevant to access a given occupation.

An individual belonging to group g employed in occupation j faces the following budget constraint:

$$c = (1 - \tau_{jg}^{w}) w_j \epsilon_j h(e, s) - (1 + \tau_{jg}^{h}) e \tag{G4}$$

Where earnings are determined by the per-efficiency unit of labor wage in occupation j, w_j, the individual's ability in that occupation, ϵ_j, as well as the acquired human capital and the wage friction. Expenditures on educational inputs e are inflated by the human capital mark-up.

Optimal choice

Conditional on a given occupation j, each individual solves the following problem:

$$\begin{aligned} U_j = \max_{c,s,e} \quad & c^{\beta}(1-s) \\ \text{s.t.} \quad & c = (1 - \tau_{jg}^{w}) w_j \epsilon_j h(e, s) - e(1 + \tau_{jg}^{h}) \end{aligned} \tag{G5}$$

The solution to this problem provides the optimal levels of s and e for a given occupation j. Substituting the optimal values, we arrive to the indirect utility of occupation j:[9]

$$U_j = \left(\frac{w_j s_j^{\phi_j} (1 - s_j)^{\frac{1-\eta}{\beta}} \epsilon_j \eta^{\eta} (1-\eta)^{1-\eta}}{\tau_{jg}} \right)^{\frac{\beta}{1-\eta}} \tag{G6}$$

Where the term τ_{jg} combines the two types of frictions in the following way:

$$\tau_{jg} \equiv \frac{(1 + \tau_{jg}^{h})^{\eta}}{1 - \tau_{jg}^{w}} \tag{G7}$$

Individuals choose the occupation j that delivers the highest utility U_j. Hsieh et al. (2013) show how a closed form for the occupational shares across groups can be obtained from optimal choices across individuals thanks to the characteristics of the extreme value distribution. The usefulness of the model stems from the fact that it allows to compute measures of τ_{jg}, a composite of labor market and human capital frictions, as a function of observable statistics in the data.

Computing occupational barriers τ_{jg}

Under the distributional assumptions of the model, the equilibrium share of group g (internees or non-internees in this case) employed in occupation j, p_{jg}, has the following log-linear form:

$$\ln p_{jg} = \underbrace{\kappa_g}_{\substack{\text{group} \\ \text{effect}}} + \underbrace{\alpha_j}_{\substack{\text{occ.} \\ \text{effect}}} + \theta \cdot \underbrace{\ln w_j}_{\substack{\text{per eff.} \\ \text{unit wage}}} - \theta \cdot \underbrace{\ln \tau_{jg}}_{\text{friction}} \tag{G8}$$

The group effect, κ_g, is a combination of the frictions that group g faces in accessing *all* occupations. The occupation effect, α_j, is related to the differing human capital accumulation technologies in different occupations.[10] The term w_j is the wage per efficiency unit in

[9] The optimal levels of s and e are $s_j^* = \frac{1}{1 + \frac{1-\eta}{\beta \phi_j}}$ and $e_{jg}^* = \left(\frac{\eta (1 - \tau_{jg}^{w}) w_j s_j^{\phi_j} \epsilon_j}{1 + \tau_{jg}^{h}} \right)^{\frac{1}{1-\eta}}$

[10] In terms of the parameters of the model $\alpha_j \equiv \ln T_j + \theta \phi_j \ln s_j + \theta (\frac{1-\eta}{\beta}) \ln(1 - s_j)$; $\kappa_g \equiv \ln \left[\sum_{s=1}^{N} \tilde{w}_{sg}^{\theta} \right]$,

occupation j, and τ_{jg} is the composite friction that group g faces in occupation j. These last two terms are scaled by θ, one of the parameters of the talent distribution.

The model also implies that in equilibrium, average earnings are log linearly separable into an occupation term and a group term:[11]

$$\ln \overline{wage}_{jg} = \underbrace{\gamma_j}_{\substack{\text{occ.}\\ \text{effect}}} - \frac{1}{\theta(1-\eta)} \underbrace{\kappa_g}_{\substack{\text{group}\\ \text{effect}}} \tag{G9}$$

The key result of the model, made clear in equation (G9), is that average wages for a given group in a given occupation do *not* depend on the level of frictions they face in that occupation. This is due to a positive selection effect arising by within-group heterogeneity in ability for occupation j. When frictions in occupation j are high for group g, only its most talented individuals (i.e., those with high ϵ_j) find optimal to access the occupation. Given the model assumptions, this positive selection effect perfectly offsets the friction effect that pushes earnings downwards.[12]

Equations (G8) and (G9) provide the key to recovering τ_{jg} from the data. Specifically, we can express relative frictions of group i (interned) with respect to those of group c (not interned) for each occupation j in terms of occupation odds ratios and wage gaps, which are observable in the data:

$$\ln\left(\tau_{ji}/\tau_{jc}\right) = -\frac{1}{\theta}\ln\left(p_{ji}/p_{jc}\right) - (1-\eta)\ln\left(\overline{wage}_i/\overline{wage}_c\right) \tag{G10}$$

That is, the relative composite friction for occupation j for group i is expressed in terms of the occupational odds ratios, normalized by the wage gap and scaled by the parameters θ and η.

The expression in equation (G10) corresponds to the composite friction, containing both labor market discrimination and human capital barriers. If we assume that both groups faced the same labor market discrimination due to their Asian origin then:

$$\begin{aligned} \tau^w_{ji} &= \tau^w_{jc} \;\; \forall j, \quad \text{and} \\ \ln\left(\tau_{ji}/\tau_{jc}\right) &= \ln\Big(\left(1+\tau^h_{ji}\right)/\left(1+\tau^h_{jc}\right)\Big)\eta \end{aligned} \tag{G11}$$

This assumption allows the recovery of the human capital frictions that internees faced with respect to their DiD comparison group. These types of frictions—barriers that prevent individuals from acquiring skills or information—are precisely the ones more likely to have been affected by the internment episode.[13] Note that even if the assumption in equation (G11) does not hold, the right-hand-side of equation (G10) can still be interpretable as a *composite* of labor market and human capital barriers.

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where $\tilde{w}_{jg} = \frac{T_j^{\frac{1}{\theta}} w_j s_j^{\phi_j} (1-s_j)^{\frac{1-\eta}{\beta}}}{\tau_{jg}}$.

[11] Note that in terms of the model $\overline{wage}_{jg} \equiv (1-\tau^w_{jg}) w_j \mathbf{E}(h_j \epsilon_j)$. Hsieh et al. (2013) provide an expression for $\mathbf{E}(h_j \epsilon_j)$ which results in the above.

[12] A result that follows and that is taken into account in the empirical implementation is that average wage gaps between two groups are constant across occupations.

[13] Hsieh et al. (2013) measure all frictions relative to those of whites males, who they assume face no frictions and thus $\tau_{jWM} = 1 \; \forall j$.

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