

# MIGRATION, LABOR MARKET DYNAMICS, AND WAGE DIFFERENTIALS IN HAWAII'S SUGAR INDUSTRY, 1901–1915

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During the colonial period in North America, the Caribbean, and South America, slave labor was common on agricultural plantations. Under the old slave regime, planters could expect to attract a sufficient supply of slaves at a price that would enable them to earn normal or above normal profits if they treated their slaves “properly” (Fogel 1989).<sup>1</sup> As slavery was gradually outlawed during the nineteenth century, new labor market institutions arose, as plantation owners and managers had to find ways to voluntarily attract migrant and indigenous workers to come and work in the fields (Engerman 1992). Some planters in Cuba and Peru replaced African slave labor with bound labor from China, but bound labor was also gradually phased out in the latter half of the nineteenth century.<sup>2</sup> The development of the sugar industry in Hawaii at the

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turn of the century offers an excellent opportunity to study the labor market dynamics associated with one phase of this process: the transition from the use of bound migratory labor to voluntary migratory labor in agricultural labor markets.

In Hawaii bound immigrants working on three-to-five year contracts were the main source of plantation labor until 1900, when annexation to the United States eliminated bound labor contracts and freed the existing labor force from their contracts.<sup>3</sup> With the transition in labor market institutions and property rights, the Hawaii planters faced a more complex situation. They sought a long-term labor supply but also had to offer an attractive enough package to convince people to voluntarily come work in their fields. The wages they offered often far exceeded the average earnings in the migrants' home country, in part to cover the uncertainties and the real and psychic costs of migrating a long distance to a strange land to perform arduous work. Yet, the high wages did not lead to a long-term commitment from many migrants. The new migrants were time and again not satisfied with life as a common cane cutter in the sugar fields. Many had migrated to distant plantation fields with the more over-arching goal of earning enough to return home with a stake that could finance a farm or business. Others had migrated with the goal of moving up the occupational ladder in their new location. Thus, the goals of the planters and of the migrants did not mesh, leading the planters into a constant search for new sources of labor. Starting with Chinese workers, the planters and the Hawaiian government recruited workers from Japan, Korea, the Philippines, Spain, Portugal, Puerto Rico, England, Germany, and Russia. The ensuing flood of immigrants swelled the population of the Hawaiian Islands from 109,020 people in 1896 to 232,856 people in 1915.

Wages on Hawaii sugar plantations varied by worker ethnicity and were strongly influenced by two features: the workers' opportunity cost wage in their country of origin and the extent of experience the workers had in the Hawaiian sugar fields. When the planters targeted a country as a source of workers, they were forced to offer wages that substantially exceeded the workers' alternatives in their home country. The result was substantial variation in Hawaiian wages that reflected differences in wages in the countries of origin. The Americans and Europeans sat at the top of the wage distribution in part because their opportunities at home were substantially better than those of the Asian immigrants. The planters may have exercised some degree of ethnic favoritism

toward Americans and Europeans as well. However, it is important to note that the number of Americans and Europeans was always relatively small because paying a high enough wage to attract a large group of American and European workers to labor in the fields would have raised labor costs to a level that would have priced Hawaiian sugar out of the world market.<sup>4</sup> Given their opportunity cost wage, it is no surprise that the Americans were concentrated in skilled and advanced positions.

Once we control for the wage in the country of origin, the ethnic wage structure reflects a ladder based on the length of time that a substantial number from that ethnic group had been working in the Hawaiian sugar fields. The Chinese were the first group of immigrants to arrive. As new migration slowed to a trickle and then stopped in 1900 and numerous workers left the fields for other opportunities, the Chinese who stayed on the plantations accumulated substantial experience, learning techniques to enhance their own productivity or availing themselves of opportunities to move into contract work or tenancy. Japanese migrants continued to migrate to Hawaii during the early 1900s, while large numbers returned home or moved on to the continental United States. The high turnover meant that relative to the Chinese, the Japanese workers in the fields circa 1900 lacked experience. As new immigration began to slow, and the U.S. and Hawaiian governments limited migration opportunities, the Japanese who stayed also began to climb the occupational ladder. Their average wage levels never quite reached the Chinese averages because the Chinese continued to have an advantage in average experience. As immigrants from each new Asian ethnic group entered the fields, they started at the bottom of the wage ladder. The exceptions to the rule for latecomers include the Spanish, Russians, and Portuguese, whose higher wages emphasize, again, the importance of the workers' alternative wage in the home country.

The parallel flows of arriving and departing workers were disrupted between 1900 and 1910 by important changes in U.S. and Asian migration policies and by changing economic conditions in Asia. Japanese immigrants to Hawaii who had planned on just three to five years of hard work in sugar fields baked by the tropical sun suddenly found themselves permanent residents of the islands. This unexpected change in circumstances caused both the plantation workers and the planters to view their employment through a new long-term lens. Dissatisfaction with their pay, their field supervisors, and their prospects for advance-

ment led Japanese workers to organize a large-scale strike in 1909. After crushing the strike, management nonetheless responded by making numerous changes in employment conditions over the next few years. These included increasing the pay of Asian workers, improving living conditions on the plantations, and employing a much larger percentage of workers under tenancy contracts requiring less supervision and allowing more worker initiative.

In this paper we focus on identifying the forces inducing labor flows to and from Hawaii and understanding how the internal dynamics of Hawaii's labor market as well as external shocks affected these labor flows and the organization of plantation work.<sup>5</sup> We begin by surveying the large annual flows of sugar plantation workers between Hawaii and Asia, Europe, the Caribbean, and the U.S. West Coast from 1878 to 1915. Building on our earlier study of Hawaii's labor market for plantation workers in 1900/1901 (La Croix and Fishback 1989), we then analyze four large data sets containing information on the jobs and wage rates of sugar plantation workers. Collected by the U.S. Commissioner of Labor Statistics, the data sets are available for 1900/1901, 1905, 1910, and 1915. Our central focus is on how the patterns of ethnic wage differentials changed over time. In addition, we investigate whether newly arrived immigrant workers were able to climb the job ladder and obtain skilled jobs as they gained more experience on the plantations. We argue that Hawaii participated in a competitive world market for new workers but that monopsonistic collusion among the planters was partially successful in maintaining ethnic wage differentials over time.

## WAVES OF IMMIGRATION AND EMIGRATION, 1878–1915

The expansion of Hawaii's sugar industry in the second half of the nineteenth century coincided with a rapid decline in the native Hawaiian population. Estimates of the native Hawaiian population at the time of Western contact in 1778 have varied from 100,000 to 800,000.<sup>6</sup> Regardless of which population estimate for 1778 is correct, the decline in population over the next 122 years was dramatic. By 1900 only 29,787 Hawaiians and 7,848 part-Hawaiians remained (U.S. Commissioner of Labor 1902, p. 29).<sup>7</sup> The decline in the native Hawaiian population was accompanied by a huge increase in demand for labor by Hawaii's surging sugar industry. An 1876 treaty between Hawaii and

the United States allowing duty-free sales of Hawaii sugar in the United States prompted a tenfold increase in labor demand by existing and new sugar plantations.<sup>8</sup> The Hawaii government responded to the labor shortages by allowing sugar planters to bring in overseas contract laborers bound to serve at fixed wages for definite periods.

Between 1878 and 1882 the sugar planters brought roughly 14,000 Chinese contract workers to Hawaii. In spite of their superior performance in the fields and mills, the planters quickly became disenchanted with the Chinese workers, as they frequently left their plantation jobs at the end of their contracts, either to return to China or to establish new businesses in Hawaii's urban areas. Only 5,037 of the original 14,000 immigrants still worked on sugar plantations in 1882 (Glick 1980, p. 19). In response to this rapid turnover and to a rising tide of anti-Chinese feeling among the populace, the Hawaii government passed a Chinese Exclusion Act in 1886 that ostensibly banned Chinese immigration after 1888. The legislation proved to be a porous barrier, as the planters used its exemptions to bring 15,000 more Chinese workers to Hawaii during the 1890s.<sup>9</sup> Chinese immigration to Hawaii ended in 1900 when U.S. laws excluding new immigrants from China became applicable after Hawaii was incorporated as a territory of the United States.

Beginning in 1885 a massive inflow of Japanese workers took up the slack resulting from the smaller flow of Chinese workers. From 1885 to 1900 approximately 80,705 Japanese immigrants arrived in Hawaii (Moriyama 1985, Tables 8 and 10). By 1900 Japanese and Chinese immigration had transformed the ethnic composition of Hawaii's population: Of the 154,000 residents, 40 percent were Japanese, 17 percent Chinese, 24 percent Hawaiian or part-Hawaiian, and approximately 19 percent Caucasian.

Migration continued to transform Hawaii's population and its labor market after annexation. Between 1896 and 1915, Hawaii's population more than doubled. The number of plantation workers increased from 24,653 in 1897 to 45,860 in 1904 before stabilizing near this level through 1915 (Table 1). The inflow of migrants was far from autonomous, as the territorial government and the Hawaii Sugar Planters Association planned, assisted, and, in some cases, subsidized much of the migration.<sup>10</sup> The HSPA promoted increased migration due to its interest in maintaining an elastic supply of labor in order to facilitate an expansion of sugar production. The large net inflows of labor facilitated

**Table 1. Ethnic Groups Working on Hawaii Sugar Plantations, 1897 to 1915**

Year	Total	Portuguese	Japanese	Korean	Chinese	Filipino	Spanish	Russian	Hawaiian	American
1897	24,653	2,218	12,068	0	8,114	0	0	0	1,497	675
1898	28,579	2,064	16,786	0	7,200	0	0	0	1,482	979
1899	35,987	2,153	25,644	0	5,979	0	0	0	1,326	806
1901	39,587	2,417	27,537	0	4,976	0	0	0	1,470	991
1902	42,242	2,669	31,029	0	3,937	0	0	0	1,493	1,032
1904	45,860	2,876	32,331	2,435	3,778	0	0	0	1,312	509
1905	44,951	3,194	28,030	4,895	3,938	0	0	0	1,711	654
1906	42,150	3,042	26,255	4,265	3,932	0	0	0	1,491	667
1907	42,122	3,351	28,035	3,180	3,364	0	0	0	1,284	544
1908	45,603	3,497	31,774	2,334	3,096	183	733	0	1,111	521
1909	44,486	3,586	31,280	1,861	2,826	155	668	0	1,172	583
1910	43,095	3,775	28,351	1,814	2,873	1,490	555	133	1,102	625
1911	44,797	3,811	28,327	1,744	2,802	3,258	526	232	1,222	670
1912	45,214	4,096	27,066	1,859	2,927	3,563	1,344	210	1,356	688
1913	46,159	4,081	25,297	1,510	2,628	7,456	1,361	137	1,109	669
1914	45,629	3,550	24,080	1,521	2,353	8,812	1,868	78	934	638
1915	44,904	3,507	24,046	1,388	2,219	8,095	1,591	97	971	627

**Notes:** The numbers represent employees of members of the HSPA and since 1906 are for January 1 each year. They include employees of one to two planters not members of the HSPA. American workers also includes all other Caucasians between 1897 and 1902.

**Sources:** Data for 1897–1899 from US Commissioner of Labor (1903); data for 1901–1915 from US Commissioner of Labor (1916, p. 18.)

**Table 2.** Arrivals and Departures, Hawaii: 1900–1915

Period and Ethnicity		Arrivals Total			Departures Total			Increase Total		
1900–1905		Male	Female	Children	Male	Female	Children	Male	Female	Children
Chinese	2,548	115	14		8,031	773	669	-5,483	-658	-655
Japanese	29,156	8,873	166		32,044	5,971	3,580	-2,888	2,902	-3,414
Korean	6,717	677	465		653	40	28	6,064	637	437
Total	38,421	9,665	645		40,728	6,784	4,277	-2,307	2,881	-3,632
		Arrivals Total			Departures Asia			Increase Total		
1906–1910		Male	Female	Children	Male	Femal	Children	Male	Female	Children
Chinese	1,340	85	91		4,122	258	624	-2,831	-174	-533
Japanese	32,208	7,721	521		8,591	3,432	4,847	7,329	3,265	-4,818
Filipino	3,894	317	167		37	9	3	3,772	308	164
Korean	24	12	9		758	90	117	-1,302	-107	-127
Iberian	2,499	1,603	2,855		1,810	1,072	0	689	531	1,136
Russian	834	370	589		368	142	173	4	224	412
Hindu	629	1	0		434	0	0	70	0	0
All Others	0	0	2,637		6	5	10	-6	-5	2,627
Total	41,428	10,109	6,869		19,608	2,273	2,413	8,172	4,042	-1,139
		Arrivals Total			Departures U.S. West Coast			Increase Total		
1911–1915		Male	Female	Children	Male	Female	Children	Male	Female	Children
Chinese	1,966	186	137		202	13	16	-909	51	-106
Japanese	6,624	9,706	1,117		183	21	11	-1,583	6,295	-3,217
Filipino	11,177	1,779	1,075		790	9	12	9,190	1,605	943
Korean	32	91	20		40	4	0	-120	72	11
Spanish	1,577	1,079	1,634		1,226	576	929	318	480	678
Portuguese	782	513	800		1,260	781	1,162	-492	-282	-400
Puerto Rican	3	1	4		267	63	92	-264	-62	-88
Russian	2,230	94	148		198	120	146	1,944	-83	-106
Hindu	23	0	0		22	1	0	-9	-1	0
All Others	2,359	419	240		2,398	402	310	-224	-22	-108
Total	26,773	13,868	5,175		6,586	1,990	2,678	7,851	8,053	-2,393

an expansion of sugar production from 229,414 tons in 1896 to 646,445 tons in 1915 (HSPA 1921, p. 96).

Both before and after annexation, the Hawaii government and the sugar planters were concerned about maintaining access to foreign labor. Planters were fearful that U.S. annexation would prevent Japanese laborers from migrating to Hawaii, and they rushed to bring Japanese migrants to Hawaii before U.S. immigration laws became applicable. As a result, the number of Japanese working on the sugar plantations increased from 12,068 in 1897 to 25,644 in 1899, the year prior to the formation of a territorial government. The planters' fears were initially unwarranted, as the U.S. government took no immediate steps to restrict Japanese immigration to Hawaii after annexation.

In 1900 the Japanese Foreign Ministry banned direct immigration from Japan to the continental United States and Canada. Japanese immigrants bypassed these restrictions by obtaining passports for Hawaii or Mexico and then quickly proceeding to the U.S. West Coast from these intermediate destinations. In addition, U.S. labor recruiters, now barred from bringing in new workers directly from Japan, refocused their attention on Hawaii's Japanese workforce. With Japanese immigration to the United States now forced through Hawaii, it is unsurprisingly that Japanese migration to Hawaii continued virtually unabated after annexation, with over 7,000 migrants arriving in 1901 and more than 14,000 in 1902 (Table 2). Many did not remain long in Hawaii. While over 29,000 Japanese males migrated to Hawaii between 1900 and 1905, over 32,000 left for either Japan or the U.S. West Coast.

At the same time that sugar planters were vigorously recruiting new laborers from Japan, they were becoming less pleased with the consequences of such an ethnically concentrated labor force. First, beginning in 1900 there was a sharp increase in the number of strikes on sugar plantations involving concerted labor action by thousands of Japanese workers. Second, Japanese workers began to look for better work on other plantations and in Hawaii's urban areas after their multiyear labor contracts with the plantations were voided in 1900. Third, since net migration flows of male Japanese workers were negative between 1900 and 1905, private and public subsidies to Japanese migration were proving ineffective in increasing the supply of labor to Hawaii's sugar plantations.

Planter concerns about losing Japanese labor to the U.S. West Coast were dampened by President Roosevelt's executive order of March



1907 prohibiting migration of nonnative-born Korean and Japanese laborers in Hawaii to the U.S. mainland. Negotiations between Japan and the United States yielded the 1908 “Gentlemen’s Agreement,” in which the Japanese government agreed not to issue passports to Japanese male laborers desiring to work in Hawaii or anywhere else in the United States. *Yobiyose* immigration—family members, spouses, or picture brides—was allowed to continue. Between 1908 and 1915, 5,890 Japanese men and 13,693 Japanese women entered Hawaii under these auspices (Moriyama 1985, p. 139).<sup>11</sup> By restricting the mobility of Japanese workers in Hawaii, the actions of the U.S. and Japanese governments transformed temporary Japanese workers in Hawaii into more permanent residents. Via these restrictions, sugar plantations secured a workforce that began to view their employment prospects through a long-term lens rather than the short-term horizon of a temporary immigrant.

The impact of migration on Hawaii’s labor market changed substantially over time because of the changing incentives of the migrants. From the initial Japanese migration in 1885, most Japanese immigrants to Hawaii had the expectation of working on the sugar plantation for a few years and then returning to Japan after they had accumulated sufficient savings in Hawaii to buy land or agricultural tools.<sup>12</sup> This *deka-segi* ideal of “temporary migration” was only partially fulfilled by the initial wave of almost 30,000 Japanese immigrants arriving between 1885 and 1894. As of 1902, 13,861 had returned to Japan, 2,034 had died in Hawaii, 877 had moved on to the U.S. West Coast or elsewhere, and over 13,000 were still living in Hawaii (Ichioka 1988, p. 46). Over 23,000 Japanese male workers returned to Japan between 1900 and 1905, over 8,500 between 1906 and 1910, and, again, over 8,000 between 1911 and 1915.

After 1900 new Japanese migrants as well as Japanese residents newly freed from their labor contracts left Hawaii for the U.S. West Coast to take advantage of substantially higher wages. An unskilled Japanese plantation worker in Hawaii earned \$16.00 per month in 1902, while a Japanese railroad section hand earned up to \$1.25 per day in the United States—almost twice as much for a 25-day month (Ichioka 1988, p. 65). Over 20,200 Japanese left for the West Coast between January 1, 1902 and December 31, 1905 and another 13,578 left during 1906.<sup>13</sup> While migration of Japanese males from Hawaii to the U.S. West Coast came to a halt after President Roosevelt’s 1907 exclusion

order, return migration to Japan continued to be a significant drain on Hawaii's plantation labor supplies.

Dissatisfaction with the high concentration of Japanese workers on plantations induced the HSPA to consider immigration from a new American territory, Puerto Rico. HSPA recruitment in Puerto Rico was facilitated by the easier access by Hawaii planters to Puerto Rican workers after U.S. annexation in 1898; by the territorial government's desire to bring more non-Asian workers to Hawaii; and by the poor economic conditions in Puerto Rico after the Spanish-American War. Between December 1900 and the end of 1901 approximately 6,000 Puerto Rican laborers migrated to Hawaii. While the Puerto Rican presence may have helped to reduce Japanese work stoppages in 1901, recruitment of new Puerto Rican workers stopped after just one year, as the planters quickly became disappointed in their productivity. Patterson (1988, pp. 13–14) argued that the dissatisfaction may have been due to poor selection by recruiting agents in Puerto Rico as well as the poor physical condition in which many of them arrived in Hawaii.

Planter dissatisfaction with Puerto Ricans caused them to investigate the potential for new immigrants from another ethnic group to provide a counterbalance to the concentration of Japanese workers. Rebuffed in their attempts to obtain a waiver from the U.S. government's Chinese Exclusion Act, planters believed that they had identified the appropriate new group when they were reassured by the U.S. government that the exclusion act did not exclude Korean workers. After the planters' agents overcame a series of objections by the Korean government to immigration, Koreans began arriving in Hawaii in December 1902, and by May 1903 almost 600 Koreans had entered Hawaii (Patterson 1988, p. 93).<sup>14</sup> After the first year of immigration planters were relatively satisfied with the performance of Korean laborers and made a decision to increase the number of Korean immigrants. By the spring of 1905 over 7,000 Koreans had entered Hawaii. At the end of 1905 Koreans represented 11 percent of the sugar plantation workforce, Japanese 62 percent, and Chinese 9 percent (Table 1).

Planter opinion on Korean productivity worsened as more Koreans arrived, with Japanese workers judged to be superior to Koreans (Patterson 1988, pp. 118–123). This is not particularly surprising, as most Japanese workers came from rural agricultural areas in southern Japan and most had already accumulated several years of experience working on Hawaii sugar plantations. By contrast, Korean workers

were recruited primarily from urban areas and had little work experience that was directly applicable to Hawaii's plantations (Patterson 1988, pp. 103–113). Roosevelt's executive order also barred Koreans living in Hawaii from migrating to the U.S. West Coast after 1907, but unlike the Japanese workers, few chose to return to Korea. The increasing Japanese political influence in Korea, culminating in its 1910 annexation of the peninsula, was a major factor preventing return migration but falling real wages in Korea may also have been important. Between 1908 and 1912 the real wage index for Korea fell from 132 in 1908 to 60 in 1912, and, after an intervening rebound, to 55 in 1917 (Williamson 1998, Appendix Table 6.3). Given that many of the Korean immigrants were originally recruited from Korea's urban areas, it is unsurprising that they quickly left Hawaii's plantations for jobs in the major urban areas. As seen in Table 1, there were 4,896 Koreans working on sugar plantations in 1905; only 1,388 remained in 1915.

Japan's increasing dominance in Korea during and after the Russo-Japanese War ended Korean migration to Hawaii. The Korean government prohibited immigration to Hawaii on April 1, 1905, after the Japanese government made known its opposition.<sup>15</sup> After 1905 the Korean and Japanese governments restricted emigration to Hawaii to approximately 1,000 picture brides who arrived between 1910 and 1924 (Patterson 1988, p. 173).

The sudden halt to Korean immigration in 1905 once again induced the sugar planters to search for alternative sources of labor. The territorial legislature set up a new board of immigration whose primary purpose was to facilitate immigration of Europeans. Three major emigration flows from Europe took place after 1905: 17,500 Portuguese between 1906 and 1913; 8,000 Spaniards between 1906 and 1913; and 2,000 Russians between 1909 and 1912. The European migrations were accompanied by the first of several waves of Filipino migration, with 18,144 arriving between 1905 and 1916. Let us consider each flow in turn.

The first wave of Portuguese emigration in the 1880s brought over 17,500 immigrants from the Azores and the Medeiros to Hawaii, almost 50 percent of them children (Beechert 1985, pp. 87–88). Immigration slowed to a trickle after 1890 due to planter dissatisfaction with the large transplanted families and the high cost of bringing them to Hawaii. Interest in Portuguese immigration resumed again in 1906 with the end of Korean migration and surged in reac-

tion to the massive Japanese strike of 1909. Despite 8,569 new arrivals between 1905 and 1915, the number of Portuguese sugar workers only increased from 3,194 in 1905 to 3,507 in 1915. This was because 8,081 Portuguese residents left for the West Coast of the United States between 1905 and 1916 (Beechert 1985, p. 132). Spanish immigration followed a somewhat similar pattern, with 3,908 arriving in Hawaii and 2,780 leaving for the West Coast between 1905 and 1916 (see Table 2).

Interest in Russian immigration was also heightened by the Japanese strike of 1909. Planters were initially satisfied with the first boatload of over 200 Russians that arrived in October 1909, and they asked the territorial board of immigration to assist new Russian immigration.<sup>16</sup> A total of 2,248 Russians arrived in Hawaii between 1909 and 1912. Partly as a result of clashes in early 1910 between the immigrants and the planters over employment conditions, less than one-third of the Russian immigrants ever took a plantation job in Hawaii. Board of immigration assistance for Russian emigration ended in 1912, and new flows of immigrants slowed to a trickle. By 1917 the HSPA reported only 49 Russians working on the sugar plantations!

Filipino migration was induced by a number of factors including the exclusion of new Japanese immigrants to Hawaii after 1907; the planters' search for new ethnic groups to counterbalance the large concentration of Japanese workers, particularly after the 1909 strike; and the new status of Filipinos as U.S. nationals after annexation in 1898. With the opening of an HSPA office in Manila in 1909, annual flows of several thousand migrants began. Filipino migration contributed significantly to Hawaii's labor force after 1909 because relatively few returned to the Philippines or ventured on to California. Of the 18,144 arrivals between 1905 and 1916, only 2,162 left Hawaii, leaving 15,982 in Hawaii in 1915 (Table 2).<sup>17</sup> This stands in stark contrast to the migratory behavior of other ethnic groups. The 86,262 non-Filipino arrivals to Hawaii between 1905 and 1916 were almost fully counterbalanced by the 81,427 non-Filipinos who left for their home country or the United States before the end of 1916. During this period Filipinos contributed only 17 percent of the arrivals to Hawaii but accounted for over 77 percent of the net population gain from migration.

**Table 3.** Composition and Earnings of Male Field Employees on Different Labor Contracts, 1902-1915

Year	Total Workers	Time Rates			Contract							
		Number	Percent	Earnings	Number	Percent	Earnings					
1902	25,474	15,307	60.10%	\$0.68	10,167	39.90%	\$0.99					
1905	23,542	17,743	75.40%	\$0.65	5,793	24.60%	\$0.83					
1910	19,824	12,769	64.40%	\$0.73	6,981	35.20%	\$0.91					
1915	17,837	10,899	61.10%	\$0.08	6,938	38.90%	\$1.23					
		Hawaiian			Portuguese and Spaniards			Other Asian				
Year	Number	Wages	Contract	Tenants	Number	Wages	Contract	Tenants	Number	Wages	Contract	Tenants
1906	1,280	98.4%	1.3%	0.3%	2,638	98.1%	0.6%	1.3%	8,161	69.1%	22.5%	8.4%
1907	1,098	98.5%	1.2%	0.4%	2,966	99.7%	0.3%	0.0%	6,518	64.8%	25.3%	9.9%
1908	934	97.2%	2.4%	0.4%	3,817	99.5%	0.4%	0.1%	5,382	67.4%	23.9%	8.7%
1909	982	95.9%	3.0%	1.1%	3,831	99.5%	0.5%	0.1%	4,691	61.8%	28.8%	9.4%
1910	980	95.3%	1.5%	3.2%	4,043	96.2%	2.2%	1.6%	4,780	42.4%	50.3%	7.2%
1911	1,076	94.5%	4.4%	1.1%	4,017	94.3%	4.1%	1.6%	4,546	41.5%	49.9%	8.6%
1912	1,191	86.7%	10.7%	2.6%	5,095	95.2%	3.4%	1.4%	4,785	32.5%	54.6%	12.9%
1913	947	92.1%	6.5%	1.4%	5,084	95.8%	2.8%	1.5%	4,138	37.5%	46.7%	14.9%
1914	769	95.6%	3.0%	1.4%	5,064	94.5%	3.6%	1.8%	3,884	45.3%	46.7%	8.0%
1915	812	93.7%	5.5%	7.0%	4,723	94.5%	3.4%	1.1%	3,657	36.1%	55.2%	8.8%
		Other Caucasian			Filipino			Japanese				
Year	Number	Wages	Contract	Tenants	Number	Wages	Contract	Tenants	Number	Wages	Contract	Tenants
1906	2,203	93.0%	2.0%	5.0%	0				25,951	73.1%	15.4%	11.5%
1907	2,039	96.4%	1.6%	2.0%	0				27,758	75.5%	15.5%	9.0%
1908	2,072	98.4%	1.0%	0.6%	183	100.0%	0.0%	0.0%	31,430	74.8%	15.2%	10.0%
1909	2,037	94.1%	3.9%	2.0%	155	94.2%	5.8%	0.0%	30,895	72.6%	17.0%	10.4%
1910	2,169	88.0%	8.8%	3.2%	1,490	100.0%	0.0%	0.0%	28,236	59.6%	27.5%	12.9%
1911	2,196	78.1%	15.8%	6.1%	3,258	83.8%	11.5%	4.7%	28,162	54.7%	29.8%	15.5%
1912	2,079	74.2%	21.5%	4.3%	3,563	68.7%	21.0%	10.3%	26,878	45.2%	35.4%	19.4%
1913	1,798	81.7%	12.7%	5.6%	7,454	70.2%	25.3%	4.5%	25,059	45.9%	32.7%	21.4%
1914	1,605	78.1%	18.4%	3.5%	8,746	70.0%	24.4%	5.6%	23,804	48.9%	31.8%	19.3%
1915	1,554	78.6%	19.2%	2.2%	8,692	61.2%	30.7%	8.1%	23,770	47.7%	35.0%	17.3%

Source: Comissioner of Labor Statistics (1916, pp. 22-28).

**Table 4.** Mean Wages for Adult Male Unskilled Workers by Ethnic Group: 1901, 1905, 1910, and 1915

Ethnic Group	1901			1905			1910			1915		
	Number Employed	Mean Wage	SD Wage	Number Employed	Mean Wage	SD Wage	Number Employed	Mean Wage	SD Wage	Number Employed	Mean Wage	SD Wage
American	30	34.65¢	16.35	30	16.71¢	10.16	83	17.58¢	10.42	22	28.70¢	1.58
Amer-Black	18	6.82¢	0.48	3	6.76¢	1.14	0			6	8.97¢	0.89
Chinese	2,355	7.30¢	1.22	3,842	7.96¢	1.13	2,883	10.32¢	2.2	2,071	11.61¢	3.32
East Indian	0			0			16	6.97¢	0	0		
Filipino	0			2	9.17¢	1.18	1,839	6.96¢	0.21	7,546	8.45¢	1.21
German	39	10.59¢	0.22	27	11.14¢	5.1	23	10.76¢	7.87	17	13.35¢	6.19
Hawaiian	438	9.11¢	2.45	1,033	8.43¢	1.76	884	9.18¢	2.08	551	9.79¢	2
Italian	22	9.00¢	0	2	10.17¢		1	10.00¢		0		
Korean	0			4,432	6.78¢	0.49	2,235	8.41¢	0.89	681	8.79¢	1.14
Japanese	16,582	7.19¢	1.33	27,745	7.41¢	1.13	26,491	9.06¢	2.07	15,945	10.71¢	2.34
Pacific Islander	0			20	7.24¢	0.72	0			5	9.22¢	0.71
Part-Hawaiian	17	9.90¢	2.65	9	8.60¢	1.02	5	13.10¢	1.5	13	15.97¢	7.94
Polish	40	8.82¢	1.41	20	8.73¢	0.2	1	8.40¢		3	10.83¢	2.17
Portuguese	1,238	8.69¢	1.67	1,725	8.21¢	1.45	2,988	8.72¢	1.4	1,721	9.76¢	1.36
Puerto Rican	78	6.65¢	0	1,467	7.05¢	0.83	1,635	8.66¢	0.76	1,181	9.52¢	1.3
Russian	0			0			86	8.07¢	0	58	9.75¢	1.28
Spanish	13	7.51¢	0.39	5	8.16¢	0.69	397	8.45¢	1.05	1,040	9.16¢	0.41
Total	20,896	7.40¢	2.11	39,156	7.48¢	1.26	39,599	8.99¢	2.1	30,879	10.03¢	2.44

**Notes:** Table does not include ethnic groups with less than 10 workers in each sample year. All unskilled workers are included in the totals.

**Sources:** Report of the Commissioner of Labor, 1901, 1905, 1910, and 1915.

## AVERAGE WAGES OF SUGAR WORKERS BY ETHNIC GROUP, 1900–1915

The U.S. commissioner of labor reported the daily and monthly earnings paid in cash to workers from various ethnic groups on the sugar plantations in 1900/1901, 1902, 1905, 1910, and 1915. Plantations generally supplemented cash earnings with in-kind benefits. Nearly all employees on sugar plantations had free housing and fuel, and as a rule, all employees earning less than \$40 per month received free medical attendance.

Calculation of worker earnings is complicated by the different types of contractual arrangements used on the sugar plantations. Four types of labor contracts can be identified. *Time rates*. The pay of most unskilled employees was by the day, with bonuses paid on many plantations to workers who worked more than 20 days per month (with 26 days constituting a full work month). *Piece rates*. Some plantations substituted piece rates for day rates, particularly for those operations that facilitate easy measurement of the output such as “cutting seed cane, planting cane, cutting and loading cane, and laying portable track; and in the mill filling, sewing, and marking bags” (*Report of the Commissioner of Labor on Hawaii* 1910, p. 21). *Contract labor*. A group of contract field hands agreed to cultivate a certain area of planted cane land that had just received its first fertilization or watering and were paid a fixed sum for each ton of cane harvested. They were typically provided with advances for each day they worked on the plot and received the remainder of their earnings at the end of the harvest. *Tenancy*. The laborer works land independently and sells the crop at a sliding contract price to the sugar plantation. Tenancy lands tended to have been wild lands requiring clearing, gulch lands that were difficult to access, and other small plots.

Table 3 shows the percentage of workers employed under time rates, contracts, and tenancy. The percentage employed under contract decreased from 1902 to 1905 before strongly rebounding in 1910 and increasing steadily through 1915. As we discuss below, the change in contracting practices was a consequence of increased experience accrued by some sugar workers and also a reaction to the 1909 strike on Oahu sugar plantations.

Table 4 provides information on average hourly earnings and employment of unskilled workers by ethnic group for 1900/1901, 1905, 1910, and 1915.<sup>18</sup> The U.S. Commissioner of Labor job and earnings

data for 1900/1901 was collected from 38 sugar plantations.<sup>19</sup> It is the only one of the four data sets in which data on worker earnings are reported by plantation.<sup>20</sup> We calculated both hourly and monthly average cash earnings of adult male workers for whom the number of hours worked per week was reported.<sup>21</sup> The hourly and monthly earnings measures are closely correlated where both are reported. The correlation between the mean hourly earnings and the mean monthly earnings for each job is 0.94. The correlation of hourly and monthly earnings by individual observation is 0.97. Given the high correlation between the two measures, we adopt, for reasons of space, average hourly earnings as our proxy for each worker's unobserved marginal wage rate.<sup>22</sup>

Table 4 registers substantial differences in the average hourly wages of unskilled workers across ethnic groups for 1900/1901. The mean wage for all unskilled workers was 7.40¢ per hour. Europeans (Germans, Italians, Poles, Portuguese, and Spaniards) and Hawaiians earned premiums of between 18 and 26 percent over the Japanese wages but comprised only 6.47 percent of the unskilled workers in our sample. Chinese and Japanese workers comprised over 90.63 percent of unskilled workers and registered hourly wage rates very close to the sample mean (1.35% discount for Chinese and 2.84% discount for Japanese). The small premium enjoyed by Chinese workers over Japanese workers could be due to the greater experience of Chinese workers. We note also that the standard deviation of wages for the entire sample of unskilled workers was relatively low, just 28.51 percent of the sample mean.

The 1905 job and wage sample incorporates data from 53 sugar plantations (Table 4). Sugar plantation employment in 1905 is distinguished from employment in 1901 by the increased presence of Puerto Ricans (1,467) and Koreans (4,432) and by the presence of a larger percentage of workers with reported hours. Overall mean hourly wages for unskilled workers increased by just 1.08 percent over the four-year period, with the standard deviation falling to just 16.84 percent of the mean. Mean wages of Japanese workers, 70.86 percent of our sample, increased by 3.01 percent. Addition of relatively unskilled and low-paid Puerto Rican and Korean workers to plantation workforces and migration of experienced Japanese workers to the West Coast of the United States and Japan may have helped to keep Japanese wages down. The mean wage of the Korean workers was only 6.78¢, while the mean wage of the Puerto Rican workers was 7.05¢. The 3.91 percent wage



premium enjoyed by Puerto Rican workers over Korean workers may have been due to the extra experience Puerto Rican workers had accumulated in Hawaii. Puerto Rican immigration was a one-time-only event, beginning in December 1900 and ending by December 1901. Thus, Puerto Ricans working on Hawaii's sugar plantations in 1905 had probably accumulated four to five years of plantation experience. By contrast, Korean workers migrated to Hawaii in 1904 and 1905, leaving them with only one to two years of experience on the plantations at the time of the survey.<sup>23</sup> The fall in the mean wage of Hawaiian workers, from 9.11¢ in 1901 to 8.43¢ in 1905, may also have been due to the increase in their numbers (from 438 in 1901 to 1,033 in 1905) and consequent decline in average experience.

The 1910 employment sample incorporates data from 52 sugar plantations (Table 4). Average hourly wage rates increased from 7.48¢ in 1905 to 8.99¢ in 1910, an average annual increase of 3.68 percent. Wage rates were held down by 1,839 newly arrived Filipino workers who earned only 6.96 cents per hour. The decline in the number of low-paid Korean workers from 4,432 in 1905 to 2,235 in 1910 worked in the opposite direction to increase average wages in the overall sample. Two large groups with below-average mean wages in 1905, Puerto Rican and Korean workers, each experienced above-average annual wage increases (4.31% for Koreans and 4.11% for Puerto Ricans), an effect possibly due to the increased average experience of each group of workers.<sup>24</sup> Japanese average annual wage increases were similar (4.02%) and were sufficient to propel them above the sample mean. Chinese annual wage increases (5.19%) led the pack, allowing Chinese wages (10.32¢) to closely approach or exceed wages paid to European workers. Notably, wages paid to most unskilled European workers increased between 1905 and 1910, but the increases were insufficient to prevent Russian, Spanish, and Portuguese wages from falling below Chinese and Japanese wages. The lower European wage rates surely reflect the lack of experience of fresh European immigrants in the sugar fields but, perhaps more importantly, highlight the relatively similar wages (adjusted for experience) paid to all unskilled workers.

The advances of the Japanese and Korean workers between 1905 and 1910 may have been partly due to the 1909 strike on Oahu's sugar plantations. As we noted above, although the strike was crushed, within a few months the planters had implemented many of the strikers' demands. Laborers paid a day wage were eligible for an end-of-the-year

bonus tied to the New York price of sugar if they worked a minimum number of days each month. Contract work, generally higher paid than day labor, was extended to a much larger percentage of the workforce, particularly among Japanese workers (Table 3). An extensive program of camp renovations was started, replacing ramshackle camps constructed for single workers with housing more suitable for families.

The 1915 employment sample incorporates data from 50 sugar plantations (Table 4). Average hourly wages for unskilled workers increased from 8.99¢ in 1910 to 10.03¢ in 1915, an annual increase of 2.19 percent. The lowest paid group of workers in 1910, the Filipinos, experienced the highest rate of wage increase, 3.88 percent. The Japanese also experienced a higher than average rate of wage increase, 3.34 percent. At the low end of the wage ladder, Korean, Puerto Rican, Spanish, and Portuguese workers continued to have below-average wages.

In sum, average wages increased significantly between 1905 and 1915 after registering only small increases between 1901 and 1905. Newly arrived ethnic groups had lower wages than ethnic groups with more experience. Europeans began the period with wage premiums but ended the period with wage discounts, as fresh European migrants were paid lower wages than experienced Chinese and Japanese workers.

The rapid decline in the wage gap between Japanese and Caucasian workers is consistent with other studies of Japanese wage differentials on the U.S. West Coast (Fishback 1998, pp. 746–47). Negative earnings differentials paid to Japanese railway and farm workers on the U.S. West Coast prior to 1900 virtually disappeared by 1911 (Higgs 1978; Murayama 1984). The proportion of Japanese workers in higher-paying jobs also increased, although some of this movement may be due to return migration to Japan by less successful West Coast workers (Suzuki 1993, 1995).

Were the wage premiums enjoyed by unskilled Caucasian workers the result of Caucasian workers having better jobs on the plantation or due to being paid a premium for doing the same job?<sup>25</sup> To investigate this question, we estimate a fixed-effect panel regression model using individual data on 130,530 unskilled workers from our four sample years: 1901, 1905, 1910, and 1915. Holding workers' jobs constant across all four sample years, we examine whether average hourly earnings are correlated with dummy variables for 12 ethnic groups and whether the correlation changes over time. Since unskilled Japanese workers are the reference group, coefficients on the ethnic dummies

**Table 5.** Weighted Least Squares Analysis of Average Hourly Earnings: 1901, 1905, 1910, and 1915

<i>Ethnic Group Dummies</i>	<i>Unskilled Wages</i>		<i>Skilled Wages</i>	
	<i>Estimated Coefficient</i>	<i>t-statistic</i>	<i>Estimated Coefficient</i>	<i>t-statistic</i>
1901 Dummy	0.094	680.2	0.134	47.53
1905 Dummy	0.086	767.4	0.149	41.32
1910 Dummy	0.101	872.5	0.144	44.7
1915 Dummy	0.117	906.7	0.164	49.35
Chinese01	0.002	10.09	0.02	3
Chinese05	0.003	12.96	0.001	0.14
Chinese10	0.012	55.96	0.004	0.53
Chinese15	0.01	37.84	0	0.06
Portuguese01	0.013	37.93	0.051	7.89
Portuguese05	0.013	46.04	0.032	5.92
Portuguese10	0.004	20.36	0.034	7.1
Portuguese15	−0.002	8.26	0.029	6.4
Hawaiian01	0.012	21.8	0.04	4.41
Hawaiian05	0.01	29.34	0.022	3.17
Hawaiian10	0.005	12.99	0.032	4.54
Hawaiian15	−0.007	15.52	0.025	3.5
Part-Hawaiian01	0.019	7.04	0.11	9.09
Part-Hawaiian05	0.009	2.47	0.069	4.82
Part-Hawaiian10	0.016	3.16	0.043	2.15
Part-Hawaiian15	0.014	4.59	0.083	8.42
Puerto Rican01	−0.002	1.77		
Puerto Rican05	−0.001	4.42	−0.007	0.26
Puerto Rican10	0.001	3.56	−0.001	0.04
Puerto Rican15	−0.004	12.57	0.012	0.76
American01	0.22	102	0.176	21.1
American05	0.072	35.96	0.157	24.64
American10	0.045	35.36	0.169	31.66
American15	0.138	58.87	0.199	32
Eastern European01	0.013	8.21	0.04	1.85
Eastern European05	0.015	6.34	0.092	3.71
Eastern European10	0.006	5.17	0.068	3.06
Eastern European15	0	0.34	0.07	3.93
Northern European01	0.08	55.31	0.163	21.87
Northern European05	0.045	26.39	0.15	23.61
Northern European10	0.014	7.99	0.157	23.58
Northern European15	0.039	18.33	0.178	27.98
Southern European01	0.016	8.66	0.034	0.93
Southern European05	0.024	4.86	0.041	1.22
Southern European10	0.004	7.51	0.053	1.93
Southern European15	−0.003	9.55	0.013	0.76
Korean05	−0.002	11.56	−0.063	2.32
Korean10	−0.007	29.68	−0.009	0.43
Korean15	−0.014	32.4	0.013	0.48
Filipino05	0.026	3.33	0.033	0.69
Filipino10	−0.008	30.22	−0.004	0.15
Filipino15	−0.015	93.51	−0.011	1.3
R <sup>2</sup> -adj.	0.77		0.76	

Dependent variable is wage of individual worker. All independent variables are dummy variables. Estimated coefficients for job dummies are not reported.

**Table 6.** Average Hourly Wage of Skilled Workers on Hawaiian Sugar Plantations, 1901, 1905, 1910, 1915

Ethnic Group	1901					1905					1910					1915				
	Number Employed		Percent of Skilled		Percent of Total	Number Employed		Percent of Skilled		Percent of Total	Number Employed		Percent of Skilled		Percent of Total	Number Employed		Percent of Skilled		Percent of Total
American	124	6.18%	0.95%	42.58¢	240	10.84%	0.92%	41.77¢	365	13.56%	1.45%	40.47¢	244	8.94%	1.13%	46.53¢				
Canadian	9	0.45%	0.07%	30.56¢	17	0.77%	0.05%	52.38¢	9	0.33%	0.03%	61.36¢	7	0.26%	0.03%	52.63¢				
Chinese	175	8.73%	10.95%	11.26¢	143	6.46%	9.23%	9.36¢	166	6.17%	7.09%	11.34¢	103	3.77%	6.34%	12.28¢				
English	17	0.85%	0.13%	46.95¢	45	2.03%	0.14%	45.88¢	54	2.01%	0.18%	48.18¢	25	0.92%	0.12%	48.96¢				
Filipino	1	0.05%	0.00%	15.38¢	3	0.14%	0.01%	17.20¢	12	0.45%	4.28%	7.77¢	97	3.55%	22.12%	8.18¢				
German	69	3.44%	0.01%	26.16¢	89	4.02%	0.41%	34.71¢	64	2.38%	0.31%	37.82¢	73	2.67%	0.38%	37.61¢				
Hawaiian	91	4.54%	2.45%	14.22¢	174	7.86%	3.00%	14.01¢	162	6.02%	2.67%	15.14¢	156	5.72%	2.22%	15.39¢				
Irish	12	0.60%	0.05%	53.19¢	4	0.18%	0.01%	62.13¢	0	0.00%	0.01%		0	0.00%	0.01%					
Japanese	1178	58.75%	75.97%	10.18¢	978	44.15%	66.36%	9.08¢	1271	47.23%	64.63%	10.25¢	1202	44.05%	50.14%	12.15¢				
Korean	0	0.00%	0.00%		10	0.45%	10.23%	8.71¢	16	0.59%	5.21%	9.28¢	9	0.33%	2.01%	12.63¢				
Norwegian	8	0.40%	0.14%	36.14¢	18	0.81%	0.10%	26.87¢	15	0.56%	0.06%	29.88¢	15	0.55%	0.08%	45.80¢				
Part-Hawaiian	49	2.44%	0.42%	25.66¢	35	1.58%	0.14%	24.77¢	12	0.45%	0.08%	35.23¢	76	2.78%	0.35%	26.32¢				
Polish	13	0.65%	0.23%	14.13¢	5	0.23%	0.06%	25.02¢	1	0.04%	0.01%	11.50¢	2	0.07%	0.01%	48.96¢				
Portuguese	204	10.17%	6.85%	18.51¢	346	15.62%	5.40%	15.42¢	416	15.46%	8.58%	14.90¢	519	19.02%	7.54%	16.53¢				
Puerto Rican	0	0.00%	0.34%		11	0.50%	3.42%	10.34¢	19	0.71%	3.83%	10.38¢	27	0.99%	3.53%	12.95¢				
Russian	0	0.00%	0.00%		4	0.18%	0.02%	24.65¢	4	0.15%	0.21%	27.34¢	7	0.26%	0.20%	18.16¢				
Scottish	27	1.35%	0.27%	39.21¢	64	2.89%	0.31%	42.54¢	63	2.34%	0.27%	42.51¢	105	3.85%	0.51%	45.65¢				
Spanish	5	0.25%	0.02%	13.37¢	5	0.23%	0.02%	10.91¢	8	0.30%	0.94%	12.39¢	22	0.81%	3.08%	12.13¢				
Total	2,005			15.76¢	2,215			18.08¢	2,691			18.41¢	2,729			19.60¢				

**Notes:** Table does not include ethnic groups with less than 10 workers in each sample year. All unskilled workers are included in the totals.

**Sources:** Report of the Commissioner of Labor, 1901, 1905, 1910, and 1915.

reflect premiums over the Japanese unskilled wage. We use weighted least squares to estimate the regressions due to the large number of identical observations in the data set, with each distinct observation assigned a weight equal to the number of workers with identical characteristics. Truncated regression results (Table 5, columns 1 and 2) are reported, with estimated coefficients for the 131 job dummies not reported.

Estimated coefficients on ethnic dummies for Northern Europeans, Eastern Europeans, Southern Europeans, Americans, Chinese, Portuguese, Hawaiians, and part-Hawaiians are all initially positive and statistically significant at the 5 percent level for 1901, indicating higher wages for these unskilled groups on specific jobs than unskilled Japanese workers. Over time, the estimated coefficients remain statistically significant but decline for all groups (except the Chinese). By 1915 Japanese unskilled workers had achieved wage premiums with respect to several groups including Portuguese, Hawaiian, and Southern European workers and had increased existing wage premiums with respect to Korean and Puerto Rican workers.<sup>26</sup>

Wage patterns across ethnic groups for skilled and supervisory employees are markedly different. Table 6 examines trends in the average monthly salary of skilled workers. Workers classified as “skilled” included mechanics and their assistants; oilers, water tenders, firemen, engineers in mills, on pumps, locomotives, and steam plows; and sugar boilers, chemists, and assistant chemists exclusive of laboratory helpers; bookkeepers, blacksmiths, carpenters, clerks, physicians, and lawyers.

Several clear patterns can be discerned from the data. First, European and American skilled workers received substantially higher wages relative to Japanese and Chinese skilled workers throughout the 15-year period. For example, in 1901 American skilled workers were paid an hourly wage of 42.58¢ while Japanese skilled workers were paid 10.18¢. Not much had changed in 1915: American skilled workers were paid an hourly wage of 46.53¢ while Japanese skilled workers were paid 12.15¢. Wage convergence was close to nonexistent. Second, the wage differentials varied significantly with respect to European origin. For example, in 1915 Spanish skilled workers were paid 12.13¢ per hour, Norwegian workers 45.8¢, and German workers 37.61¢. Third, Japanese and Chinese workers made little progress in filling more of the skilled jobs in our sample over the 14-year period. They constituted 67.48 percent of the skilled workforce in 1902 and 47.82 percent in 1915.<sup>27</sup>

**Table 7. Average Hourly Salary of Foremen and Overseers on Hawaii Sugar Plantations, 1901, 1905, 1910, 1915**

Ethnic Group	1901				1905				1910				1915			
	Number Employed	Percent of LF	Average Wage	Number Employed	Percent of LF	Average Wage	Number Employed	Percent of LF	Average Wage	Number Employed	Percent of LF	Average Wage	Number Employed	Percent of LF	Average Wage	Percent of Off
American	68	0.95%	11.56%	132	0.92%	15.03%	169	1.45%	17.17%	123	1.13%	12.53%	43.95¢			
Canadian	5	0.07%	0.85%	6	0.05%	0.68%	4	0.03%	0.41%	2	0.03%	0.20%	33.60¢			
Chinese	41	10.95%	6.97%	24	9.23%	2.73%	22	7.09%	2.24%	20	6.34%	2.04%	15.41¢			
English	14	0.13%	2.38%	14	0.14%	1.59%	23	0.18%	2.34%	16	0.12%	1.63%	40.14¢			
Filipino	0	0.00%		0	0.01%		3	4.28%	0.30%	7	22.12%	0.71%	10.90¢			
German	52	0.01%	8.84%	63	0.41%	7.18%	48	0.31%	4.88%	43	0.38%	4.38%	35.53¢			
Hawaiian	47	2.45%	7.99%	98	3.00%	11.16%	109	2.67%	11.08%	62	2.22%	6.31%	17.77¢			
Irish	4	0.05%	0.68%	1	0.01%	0.11%	2	0.01%	0.20%	2	0.01%	0.20%	46.00¢			
Japanese	84	75.97%	14.29%	122	66.36%	13.90%	220	64.63%	22.36%	198	50.14%	20.16%	13.00¢			
Korean	0	0.00%	0.00%	4	10.23%	0.46%	7	5.21%	0.71%	4	2.01%	0.41%	11.70¢			
Norwegian	17	0.14%	2.89%	18	0.10%	2.05%	10	0.06%	1.02%	9	0.08%	0.92%	28.31¢			
Part-Hawaiian	32	0.42%	5.44%	17	0.14%	1.94%	11	0.08%	1.12%	32	0.35%	3.26%	24.68¢			
Portuguese	167	6.85%	28.40%	274	5.40%	31.21%	297	8.58%	30.18%	367	7.54%	37.37%	17.79¢			
Puerto Rican	1	0.34%	0.17%	7	3.42%	0.80%	7	3.83%	0.71%	14	3.53%	1.43%	13.80¢			
Russian	1	0.00%	0.17%	4	0.02%	0.46%	2	0.21%	0.20%	3	0.20%	0.31%	17.33¢			
Scotch	36	0.27%	6.12%	66	0.31%	7.52%	44	0.27%	4.47%	68	0.51%	6.92%	44.45¢			
Spanish	4	0.02%	0.68%	0	0.02%	0.00%	2	0.94%	0.20%	5	3.08%	0.51%	13.10¢			
Total	588		20.27¢	878		21.72¢	984		22.15¢	982		23.52¢				

Notes: Ethnic groups with less than 4 foremen/overseers in all four years were not included in the table but are included in the totals.

Sources: Report of the Commissioner of Labor, 1901, 1905, 1910, and 1915.

Are the wage premiums enjoyed by skilled Caucasian workers the result of Caucasian workers having better jobs on the plantation or due to being paid a premium for doing the same job? To investigate this question, we once again use weighted least squares to estimate a fixed-effect panel regression model using individual data on 9,640 skilled workers from our four sample years.<sup>28</sup> Truncated regression results (Table 5, columns 3 and 4) are reported, with estimated coefficients for the 85 job dummies not reported. Ethnic dummies for Northern Europeans, Eastern Europeans, Americans, Portuguese, Hawaiians, and part-Hawaiians are positive and statistically significant for all four sample years, indicating higher wages for these workers on specific jobs than the reference group, Japanese workers. Following the regression results for unskilled workers, estimated coefficients on the part-Hawaiian, Hawaiian, and Portuguese dummies decrease between 1901 and 1915. However, contrary to the results for unskilled workers, estimated coefficients on the American, Northern Europe, and Eastern European dummies increase over the sample period and remain statistically significant at the 5 percent level.<sup>29</sup>

Table 7 examines the average monthly salary and employment of overseers and foremen from the major ethnic groups. Several broad patterns are evident. First, ethnic wage differentials are strikingly evident throughout the four samples, with European and American supervisors paid significantly more than Chinese, Japanese, Korean, Filipino, and Puerto Rican supervisors. Second, Japanese and Portuguese supervisors were a larger percentage of the supervisory labor force in 1915 than 1901. Third, the number of Japanese supervisors increased substantially, from 84 workers (14.29%) in 1901 to 198 workers (20.16%) in 1915.<sup>30</sup> While this represented a slight degree of progress, Japanese workers were still underrepresented in the overseer/foremen ranks compared to their overall numbers in 1915.

## UNDERSTANDING LABOR MARKET DYNAMICS IN HAWAII

### Planter Demand for Multiple Ethnic Groups

Why did the Hawaii government and the Hawaii Sugar Planters' Association recruit so many different ethnic groups to work in the fields? The most important economic goal was to find that elusive ethnic group that would provide an elastic *and* productive supply of labor

to the plantations. In addition, the planters expressed concerns about increasing the variety of ethnic groups working on the plantation in order to reduce the likelihood of strikes as well as to prevent Hawaiian politics from being dominated by a new generation of Asian-American voters.

At the turn of the century the HSPA was concerned about the potential for organized labor actions by Japanese employees, as they constituted 73 percent of the plantation labor force in 1902 (Table 1). Twenty strikes by Japanese workers took place in 1900 with complaints ranging from "fines, brutal overseers, retention of withheld wages, refusal to cancel contracts, poor sanitation and water supply in the camps, and holiday work and unfair task systems" (Beechert 1985, p. 121). Disturbed by the coordinated action by Japanese workers, employers decided to recruit other ethnic groups to the plantation workforce with the hope of increasing the cost to employees of organizing and striking. Their reasoning was that labor actions would be more difficult to coordinate across multiple ethnic groups than within a single dominant group. Employers would, therefore, be willing to pay a wage premium to new ethnic groups whose presence as employees would reduce the probability and duration of labor actions.

Circa 1900 the U.S. federal government and the new Hawaii territorial government were less worried about labor strife than about the political consequences of future domination of Hawaii politics by the sons of Asian immigrants. Although native and foreign-born Chinese and Japanese males made up over 75 percent of the adult male population in 1900, immigrants from Asia were ineligible for naturalization and could not vote. Their native-born children were, however, automatically citizens by virtue of the U.S. Constitution. By assisting more Caucasians to migrate to Hawaii, the federal and Hawaii governments believed that the influence of the new Asian citizenry on future Hawaii elections might be reduced.<sup>31</sup> The 1905 Report of the U.S. Commissioner on Labor Statistics called for more Caucasian immigration, and the newly established Board of Immigration recruited workers from Italy, Spain, Russia, and Portugal, particularly after the Gentlemen's Agreement and the 1909 Japanese strike.

Still, the fundamental economic goal was to seek an elastic yet relatively permanent workforce. The planters wanted to find an immigrant group that would come to Hawaii and work on the plantations for an extended period of time. Ideally, the immigrants would stay on the



sugar plantations and become more productive as they gained experience and moved to more skilled jobs. Since the planters were subsidizing the cost of passage for new employees, an extended stay by the average plantation worker in plantation work (although not necessarily on the same plantation) would contribute to amortizing passage costs. The planters also wanted to establish connections with the home country so that during periods of expansion in the sugar industry they could bring in more field workers. Ideally, during downturns the workers might return home (thereby reducing the necessity of providing sustenance to them), with the expectation of returning when the demand for sugar rose sharply again. Of course, as events suggest, the planters never were able to establish this ideal relationship.

The planters' failure to accomplish this goal was primarily due to its clear conflict with the main goal of the immigrant workers: to raise the present value of their lifetime stream of earnings. Most migrants saw Hawaiian sugar plantations as a stepping stone to greener pastures. Every set of new immigrants was attracted to Hawaii by wages that were significantly higher than the wages for relatively unskilled workers in their homelands. Many immigrants saw unskilled work on a plantation as only one rung of a ladder of opportunities to climb over the course of their lives. They anticipated working in the sugar fields for a long enough period of time to obtain enough earnings to either return home and purchase farm land or as a means to moving on to the U.S. West Coast where wages were still higher and opportunities to own and farm land were available.<sup>32</sup> The high wages for plantation work in Hawaii seemed a more effective way to climb the first rung of the job ladder than working at home, as unskilled jobs in Hawaii offered more opportunities for saving.

The conflict between the goals of the planters and those of the migrants meant that one of the groups was going to be dissatisfied with the results of the migration. Despite all of their political and economic clout, it appears that the planters were the group that was most dissatisfied. Nearly every ethnic group that immigrated displayed enormous rates of turnover in the plantation fields. Large numbers left the sugar fields to return home, either immediately if they found the work too harsh, or after a period of time when they saw opportunities to save a substantial amount to help them obtain land when they returned home. Many others left the plantations to establish small businesses in urban areas in Hawaii, or they took the opportunity to leave for the U.S. main-

land (Table 2). For most immigrants, working in the sugar fields allowed them to climb the first step of the job ladder and then move on to better opportunities. From the perspective of the sugar planters, the goal of a productive, stable, yet elastic workforce was not satisfied fully with any of the multiple ethnic groups with which they experimented.

Prior to becoming a U.S. territory in 1900, Hawaii's sugar planters faced elastic supplies of labor from numerous countries, albeit at wages well above the workers' opportunity cost wages in their home country. The planters' central task was to identify which ethnic group could provide them with the best wage-productivity combination, that is, generate the highest economic rents to the planters. In the absence of other factors, only this group would be hired. After their three-year contract expired, freed workers had little leverage with the sugar plantations. At the end of the contract most workers returned to their home country.<sup>33</sup> Those who stayed in Hawaii either left the sugar industry or were paid higher wages to reflect experience-based productivity gains if they continued working on the sugar plantation. More broad-based demands for higher wages were, however, likely to be unsuccessful given the planters' access to an elastic supply of immigrant labor from the same country. In spite of the constant immigration of new contract laborers, the percentage of contract laborers in Hawaii's sugar fields declined in the 1890s. By 1897 less than 55 percent of the 23,000 field hands in Hawaii were under bound contracts. The remaining workers were day men who were free to move from plantation to plantation (U.S. Department of Labor 1903, p. 696).

This planter-organized immigration was disrupted when the 1898 annexation of Hawaii by the United States led to a major institutional change in Hawaii's labor market for plantation workers. When Hawaii's annexation to the United States became official on June 14, 1900 all penal contracts made after August 12, 1898 were declared null and void and terminated. These workers gained instant mobility. The U.S. commissioner of labor (1902, p. 17) found that the increase in mobility led to advances of the wage for field hands from \$12.50 per month of 26 working days prior to annexation to \$15, \$17, \$18, \$20, and up to \$26 in some cases. In addition, annexation gave all but the Chinese workers the additional outlet of immigrating to the U.S. mainland. Over 67,350 Japanese residents left Hawaii for the U.S. mainland or Japan between 1900 and 1907 (Table 2).

Once sugar plantation workers were unbound from their penal contracts, there were few other obstacles to mobility across plantations. The sugar plantations all appear to have been involved in a single labor market. Although plantations were scattered over five major islands, the cost of water transport to another island was very low. Recruiters from plantations on the outlying islands regularly visited Honolulu in search of laborers. Moreover, over 70 percent of the immigrant workers were unmarried and therefore faced low moving costs. In this competitive environment, one would expect that the wage rate paid unskilled labor would rapidly equalize across islands, plantations, and ethnic groups. However, as shown earlier, ethnic wage differentials for unskilled workers narrowed between 1900 to 1915 but did not disappear.

After 1900 the planters cooperated to reduce the costs of bringing new immigrants to Hawaii. Operating as a small player in a large world market for migrants, the planters had no market power with respect to wages of new migrants. Cooperation among the planters could, however, reduce the costs of bringing migrants to Hawaii and reduce competition among plantations for the new workers once they had arrived in Honolulu. Their planters' efforts were coordinated by the HSPA, which hired recruiters to find promising new sources of immigration, to assist immigrants with passage to Hawaii, and to provide immigrants with promises of jobs on specific plantations at specific terms.

Planter cooperation in bringing immigrants to Hawaii also created the machinery to reduce competition among plantations for both existing and new plantation workers. The close ties of the 52 sugar plantations with five large firms (known as the Big Five) that provided financial and marketing services and the existence of an industry trade association meant that a centralized monitoring system was already in place to report deviations from agreements on wages of unskilled workers. Beechert (1985, p. 133) reported that the planters tried to restrict mobility by maintaining a system of passbooks for the workers, but generally the passbooks were quickly ignored when the need for workers arose. While this competition for workers often led to a temporary rise in wages, followed by a series of *mea culpas* by the plantation owners and exhortations that they needed to stop this competitive nonsense, wage differentials for unskilled workers narrowed yet also persisted (as shown above) through 1915.

By centralizing immigrant recruiting, the HSPA was able to act much like a single firm in determining the wages paid new migrants to Hawaii. To attract migrants they had to offer a wage that was significantly higher than the prevailing wage in the migrants' home country, even if the wage might be higher than the wages paid to ethnic groups already working in Hawaii.<sup>34</sup> Thus, ethnic differences in wages may have been driven less by a pure distaste for association with a specific ethnic group than they were by the wage rates that unskilled labor could command in the ethnic group's home country. (In fact, the planters seemed to dislike all of the ethnic groups that they recruited!) In this case, discriminatory wages reflected the hard fact that to attract new labor from other sources, the planters would have to sometimes pay higher wages to groups with higher opportunity wages in their home countries.

We construct a simple model of a firm subject to work stoppages in order to examine more closely the implications of changes in opportunity cost wages and the work environment. We assume that the firm faces elastic supplies of labor from high-wage immigrant group one and low-wage immigrant group two with ( $w_1 > w_2$ ). The firm represents the group of sugar plantations in Hawaii. Since Hawaii was a small destination that could not accommodate more than a few hundred thousand immigrants, we treat Hawaii as a small country in our model. This means that we model the supply of immigrants from the country of origin as perfectly elastic. The wage paid to new immigrants is positively related to the wage paid in the home country (superscript  $J$  is "Japan" and superscript  $E$  is "Europe") and to the cost of immigration,  $p$ .

$$w_2 = w_2(w_2^J, p) \quad (1)$$

$$w_1 = w_1(w_1^E, p) \quad (2)$$

Sugar is produced using capital and labor differentiated by ethnic origin.

$$S = f(L_i, L_j, K) \quad (3)$$

Differentiating labor by ethnic group is important, as laborers from different countries have different work experiences in agriculture, educational backgrounds, physical attributes, and employment goals.

Unless there are costs to hiring just one ethnically concentrated group, the firm hires only the group with the best productivity-wage combination. Following our earlier analysis, we posit that a single concentrated group of ethnic employees will have a greater ability to organize and impose costs on the employer than an ethnically diverse group of employees. We assume that the costs imposed on the employer are a function of the Hirschmann-Herfindahl index of employee concentration ( $h$ ), where

$$h = \sum_i^n L_i^2 \quad (4)$$

and  $g$  is the cost imposed on the employer from concentration of ethnic employees, where

$$g = g(h(L_1, L_2)) \quad (5)$$

We assume that the Hawaiian sugar firms maximize profits *w.r.*  $K$ ,  $L_1$ , and  $L_2$ .

$$\pi = p \cdot s - w_1 L_1 - w_2 L_2 - rK - g(h(L_1, L_2)) \quad (6)$$

The first-order conditions are as follows.

$$\frac{\partial \pi}{\partial L_1} = p \cdot f_{L_1} - w_1 - g_h \frac{\partial h}{\partial L_1} = 0 \quad (7)$$

$$\frac{\partial \pi}{\partial L_2} = p \cdot f_{L_2} - w_2 - g_h \frac{\partial h}{\partial L_2} = 0 \quad (8)$$

From equations (8) and (9), we find that:

$$\frac{\partial \pi}{\partial K} = p \cdot f_K - r = 0 \quad (9)$$

$$f_{L_1} - w_1 - g_h \cdot h_{L_2} = f_{L_2} - w_2 - g_h \cdot h_{L_2} \quad (10)$$

In other words, labor-hiring decisions are implemented to equate marginal rents from each type of labor.

**Table 8.** Real Wages in Home Countries of Hawaii  
Sugar Workers as a Percentage of Real Wages in Great Britain

Year	Japan	Korea	China	Philippines	USA	Portugal	Spain	Norway	Germany	Canada
1885–1889	22				146	54	50	46	76	153
1890–1894	18				146	42	50	55	76	165
1895–1899	20			18	143	38	47	62	77	168
1900–1904	22		6	27	160	43	48	69	83	168
1905–1909	24	35	10	26	159	42	48	73	81	177
1910–1914	28	23	15	28	160	39	50	71	84	200
1915–1919	35	25	16	46	193		49	116	89	146

**Notes:** Series are arithmetic averages for the five-year period. Portugal series for 1910–1914 only includes 1910–1912. USA, Spain, Norway, Germany and Canada series for 1910–1914 only include 1910–1913.

**Sources:** Williamson (1998, Table 3) Williamson (1995, Table A2.1).

**Table 9.** Normalized Ratio of Real Wages of Sugar  
Workers in Hawaii to Real Wage Index in Home Country

Year	Japan	Korea	China	Philippines	USA	Portugal	Spain	Germany
Unskilled Workers								
1901	1.77		6.60		1.17	1.10	0.85	0.69
1905	1.71	1.07	4.40		0.58	1.08	0.94	0.76
1910	1.89	2.13	4.01	1.45	0.59	1.17	0.89	0.67
1915	2.26	2.60	5.37	1.36	1.11		1.40	1.12
Skilled Workers								
1901	2.51		10.18		1.44	2.33	1.51	1.71
1905	2.09	1.38	5.18		1.44	2.03	1.26	2.37
1910	2.13	2.35	4.40	1.62	1.34	1.99	1.42	2.35
1915	2.57	3.74	5.68	1.32	1.78		1.83	3.13

**Notes:** Hawaii wages were converted to British pounds using a purchasing power parity exchange rate (\$7.59/pound) computed with benchmark data for Hawaii for 1905. Calculations are available upon request from the authors. Our calculations assume that sugar plantation employees worked 60 hours per week. See Williamson (1995, Appendix 3) for the methodology employed to calculate purchasing power parities.

The model yields four main results. First, if the marginal rent derived from the labor of one ethnic group is always greater than the marginal rent from the labor of a second ethnic group, then workers from group two will not be brought to Hawaii. Second, “low rent” groups are only hired if employer costs of dealing with an organized group of ethnic employees are sufficiently high; these costs are largest when the organized group is a relatively large share of total employees. A corollary result is that the employer will be forced to switch to the low-rent group

if there are limits on the number of workers that he can hire from the high-rent group. Third, more of the high-rent group will always be hired even in the presence of work stoppage costs. Fourth, changes in the Hawaii wage paid to different ethnic groups should be closely related to changes in the home country wage rate due to the elastic supply of new immigrants from the home country.

Were wages paid to workers closely related to wages in their home country? Analysis of this issue is facilitated by the long data series on real wages in Europe and Asia recently compiled by Jeffrey Williamson (1995, 1998). For the most part, these series encompass the period 1900–1915 (Table 8). Using Great Britain as a basis for comparison, Williamson finds that between 1900 and 1915 real wages in Japan, the Philippines, Korea, and China were between 6 and 46 percent of British real wages. Relative wage rates in Portugal and Spain were significantly higher, ranging from 39 to 49 percent of British wages, while in the United States real wages were 157 to 193 percent of British wages.<sup>35</sup>

Table 9 compares purchasing power parity wages from the home country with purchasing power parity wages in Hawaii for skilled and unskilled workers.<sup>36</sup> Purchasing power parity wages for Hawaii are derived by computing a benchmark real wage index for 1910 using Williamson's (1995, Appendices 2 and 3) methodology. Prices of 11 food items and the weekly rent for three rooms are used to compute a purchasing power parity of \$7.59/£. This compares with an official \$4.86/£ exchange rate and a purchasing power parity for the United States of \$6.48/£. In effect, the price level in Hawaii was 17 percent higher than on the mainland United States, with most of the differential driven by higher housing rents in Hawaii. The Hawaii weekly wage was computed for each ethnic group using the average number of hours worked in 1901 for all ethnic groups—60 hours.

Table 9 shows that both skilled and unskilled immigrant workers in Hawaii were paid a significant premium above weekly wages in their home countries. The premium varies significantly across ethnic groups, with Chinese workers receiving premiums varying from 302 to 653 percent and American workers receiving premiums varying from 37 percent to 90 percent over the sample. The large and persistent premiums indicate that each ethnic group is earning significant rents from working in Hawaii regardless of its relative wage in the Hawaii labor market. The large differences in the size of the premiums across groups and

over time also indicate that other factors are driving ethnic wage rates in Hawaii besides home country wages.

The differential wage rates paid to different ethnic groups for the same jobs also had to be consistent with workers' opportunities in alternative employment in non-plantation Hawaii jobs, or these workers would leave the sugar plantations for urban areas and jobs. The Hawaii territorial government acted to effectuate lower wages for Japanese, Korean, and Chinese sugar workers by regulating opportunities for work off the plantation. Government officials in 1902 attempted to prevent them from entering the fishing industry by imposing a tax on fish caught by aliens. The superintendent of public works in Hawaii in 1902 specified that "Asiatics" could not be hired on public road crews. Sections of the "Act to Provide a Government for the Territory of Hawaii," provided that government land could not be acquired or held by or for the benefit of any alien. Naturalization was possible only after five years of residence (Moriyama 1985, p. 145). In spite of these restrictions, Japanese, Korean, and Chinese workers found numerous opportunities to participate in the urban economy. Approximately 50 percent of workers in personal and domestic service, trade, transportation, and manufacturing were either Japanese or Chinese by 1905 (U.S. Commissioner of Labor 1906).

Consider now the change from the bound labor market of 1900 to the free labor market of 1901 and how our model can be used to analyze this change. First, in a free labor market new immigrants would have the option to continue on to a higher wage destination if they could finance the travel expenses. In 1901 labor recruiters from California and Washington actively pursued new Japanese immigrants for work on the West Coast (Murayama 1984). The result was that the elastic supply of labor from Japan was now available only at the higher California wage rate rather than the lower Japanese wage rate. As will be seen shortly, the average wage in Japan also was continually rising between 1890 and 1920, putting additional upward pressure on the Japanese wage in Hawaii. As we noted earlier, this, in addition to accumulated experience, had the effect of considerably raising plantation wages for Japanese laborers.

Second, after August 1900 the newly freed laborers had the opportunity to organize, usually along ethnic lines, and protest working conditions that they were forced to endure as contract laborers. In this model this effect is represented by an increase in  $g$  and in  $g'$ . The higher mar-



ginal cost of more frequent work stoppages implies that employers had renewed incentives to hire workers from new or less concentrated ethnic groups. The higher wages paid to Japanese laborers after they were freed facilitated this adjustment, as higher-wage European groups became relatively less expensive.

Why did the planters bring in so many ethnic groups? Was it really necessary to bring in four to five new ethnic groups to reduce the costs of work stoppages? One plausible explanation is that the planters made mistakes in estimating the productivity of new immigrants working at Hawaii sugar plantations. In particular, there is considerable evidence that the planters were surprised by the low productivity of new Puerto Rican, Korean, and Russian workers. Given that the planters were forced by the wages in the home country to pay higher wages to the Puerto Ricans and Russians relative to Filipinos, the planters quickly shifted their recruiting efforts to other groups. Foreign restrictions on migration to Hawaii also impaired immigrant flows from Korea and the Philippines. Without these policy and productivity surprises, the planters probably could have achieved their objective of reducing labor strife by bringing in just one or two new ethnic groups.

#### Changes in Worker Incentives and the Organization of Plantation Work

U.S. government policies on migration within the United States and to the United States also had strong influences on the labor market situation. When the United States limited the migration of male Japanese workers to Hawaii and to the U.S. mainland in 1907, one of the long-range opportunities that drove Japanese migration to Hawaii was eliminated. Suddenly, plantation work was no longer a stepping stone to a more independent life in California or the Pacific Northwest. As a result, a large number of Japanese workers returned home and the flood of new migrants to Hawaii was stemmed. The only new migrants were parents, brides, and children of those Japanese who decided to stay on in Hawaii.

From the perspective of Hawaii's planters, the "elastic" supply of labor from Japan ended, but the opportunity wage for Japanese workers in Hawaii fell from the wage in California (minus amortized migration costs) to the wage in Japan (minus amortized migration costs). The fall in the opportunity cost wage helps us to understand the forces behind

the 1909 Japanese strike against the sugar plantations. With their migration options strongly limited, the Japanese workers were, as predicted by Hirschman (1971), more willing to rely on collective action to improve their future prospects.

Japanese-language newspapers in Honolulu had publicized the declining welfare of Japanese sugar workers since 1905. They noted that the cost of living in Hawaii had risen rapidly, while increases in wage rates had not kept pace. The average compensation of contract cultivators declined from \$.99 per day in 1902 to \$.91 per day in 1909, while pay of day laborers increased from \$.68 in 1902 to \$.73 in 1909 (Table 4). With the formation of the Higher Wages Association came demands to increase the monthly wage for all field hands, to reduce the workday to 10 hours, double time on Sundays, and to improve plantation housing for families. Japanese workers on Oahu plantations began a strike in the first week of May 1909 that lasted until the end of August 1909. Planters made no major concessions to the strikers.

The clash between workers demand for better living conditions and the falling opportunity cost wages for Japanese workers brought about several changes in the plantation labor market. The Japanese workers choosing to remain in Hawaii stayed on the plantations longer and accumulated more experience. This increase in experience led to institutional changes in the labor market. Two new rungs were added to the job ladder on the plantations. First, planters began contracting with groups of workers, who appear to have been more productive, information gleaned perhaps from the higher earnings of these groups. A higher rung was also added to the ladder as Japanese began tenant farming. Thus, the U.S. limitations led to a self-selection process that left more experienced and productive Japanese in the plantation workforce and led to pressures for new ways of sharing the fruits of plantation labor. The planters still sought more and more workers to fill their demands for unskilled work, yet these workers now had to come from places where the workers would not be as restricted in their opportunities to go to the U.S. mainland.

While other ethnic groups were more prone to remain in plantation work than the Japanese, the large number of Japanese workers that decided to make a career of work on the sugar plantations significantly changed the labor market for plantation workers. While 7,728 Japanese workers left the sugar fields between 1908 and 1915, there were still 24,046 Japanese workers employed on plantations in 1915. The objec-

tives of these workers were clearly different than the objectives of the Japanese workforce at the turn of the century. Instead of focusing on accumulating wealth to facilitate family formation in Japan, workers concentrated instead on forming and supporting a family in Hawaii. Between 1908 and 1915 almost 13,700 Japanese women entered Hawaii. U.S. Immigration officials estimated that 58 percent were picture brides (Moriyama 1985, p. 140). The number of Japanese births in Hawaii jumped from only 573 in 1900 to between 2,200 and 3,700 from 1903 to 1910. The number of Japanese pupils in private and public schools rose from 1,352 in 1900 to 13,553 in 1915 (*Report of the Commissioner* 1915, p. 61). The more settled Japanese population with its new longer-term perspective had incentives to focus on community institutions and prospects for advancement in the political arena. Thus, the Japanese who remained in Hawaii after 1915 made significant advances within the sugar plantations and, more importantly, in urban Hawaii.

## CONCLUSION

The decline of slavery in the plantation economies around the developing world during the nineteenth century forced planters in isolated areas to find ways to attract workers to voluntarily migrate to work in their fields. In Hawaii the sugar planters sought to secure an elastic and permanent supply of labor. Their efforts to attract workers for the long haul were typically stymied as the immigrants came to Hawaii with different goals. The vast majority of immigrants sought to earn enough to return home with greater wealth and start their own farm or to use work in Hawaii as a stepping stone for further migration to even better opportunities. As a result, the planters continually turned to new locations to recruit more workers.

To attract workers, the planters paid wages that were typically well above the opportunity cost wage in the worker's country of origin. Since the wages in various countries around the world varied, this policy led to substantial differences in the wages paid to ethnic groups in Hawaii. After controlling for the differences in home country wages, wage differentials across ethnic groups existed in part as a reflection of the difference in their average experience in the Hawaiian sugar fields. As the gap in experience narrowed, wage differentials between ethnic groups for less skilled work also narrowed. The Hawaiian sugar plant-

ers were organized to reduce wage competition among plantations and had succeeded in finding ways to limit non-sugar-related opportunities for some ethnic groups in Hawaii. Yet, the premium paid for unskilled American workers fell by one-third between 1901 and 1915 and for European workers by 50 percent or more over the same period. While similar wage gaps disappeared during this period on the U.S. West Coast, Hawaii plantations were able to maintain a portion of the wage gaps because they constantly found new low-wage immigrants to work in the Hawaii market. The "occupational" gap was, however, never closed over our sample period. While workers were awarded more independence via tenancy contracts, they failed to climb many rungs up the job ladder on the sugar plantations in Hawaii.

The Japanese experience, in particular, shows the importance of the mismatch between the planters' and the immigrants' goals. In the early 1900s while the planters sought to attract Japanese workers as permanent additions to the workforce, Japanese turnover in the sugar fields was enormous. Large numbers of new Japanese immigrants were brought in to Hawaii, while large numbers returned home or left for the West Coast of the United States. After the Gentlemen's Agreement restricted migration in 1907, the number of Japanese coming to Hawaii fell sharply. A significant number returned home, while those who stayed saw some improvement in their relative standing. Their average experience in the sugar fields was greater than that of the incoming immigrants and they began to use collective action to try to secure improvements in their earnings and working conditions. While the 1909 Japanese strike was quickly crushed, plantations moved to accommodate many of the strikers' demands for more independent work and better living conditions. Simultaneously, the planters also took steps to raise the cost of collective action by recruiting large numbers of workers from the Philippines. The effects of the more heterogeneous labor force were obvious in the Dual Union Strike of 1920, in which Japanese and Filipino unions tried to coordinate a long strike. As Beechert (1985, p. 200) noted, "[t]here was in fact little basis for the development of mutual interests" between the two groups, and the strike ended after 165 days, with the workers conceding defeat. Thus, as the Japanese workers became more settled after the Gentlemen's Agreement and adopted a more long-run attitude to plantation work, the planters took steps to accommodate the goals of their more permanent workforce and to restrict its ability to organize concentrated labor actions."

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## NOTES

1. “Proper” treatment was in part determined by the ease with which the planter could replace the slave.

2. See Stewart (1951) for a history of bound Chinese labor in Peru and Hu-Dehart (1993) for Cuba.

3. See Coman (1903) for an early analysis of migrant labor in Hawaii.

4. See La Croix and Grandy (1997) for a discussion of the extent of protection provided Hawaii sugar by U.S. tariffs.

5. See Baines (1995) for an excellent overview of European migration to the Americas. See Williamson and Hatton (1998) for comprehensive econometric and simulation analyses of the causes and consequences of European migration to the Americas.

6. Bushnell (1995), in his careful review of this controversy, tentatively concludes that there were around 300,000 to 400,000 native Hawaiians at contact.

7. See La Croix and Roumasset (1990) for an analysis of the effect of declining population on Hawaii's economy and political institutions.

8. See La Croix and Grandy (1997) for an analysis of the effects of the reciprocity treaty on Hawaii's sugar industry and on relations between the United States and Hawaii.

9. Portuguese workers were brought in during the early 1880s to counterbalance the Chinese, but planters found them too expensive and stopped recruiting efforts in the mid-1880s.

10. The 1900 Organic Act, which established a U.S. territorial government in Hawaii, prohibited the Hawaii government from assisting or subsidizing immigration to Hawaii. In 1905 the territorial legislature established a new Board of Immigration to suggest sources of new workers and to provide statistical reports on immigration. Activities were funded by private subscription from sugar planters. In 1907 the U.S. Congress prohibited private contributions to government-run immigration offices, and the Board of Immigration became fully funded by the territorial government.

11. The Foreign Ministry of Japan stopped issuing passports to picture brides from March 1, 1920 after agitation against the practice in California increased in 1919.

12. See Baines (1995, chap. 5) for a discussion of the extensive return migration from the United States back to Europe between 1860 and 1930.

13. The number of Japanese workers on the sugar plantations increased between 1901 and 1905 despite the excess of departures over arrivals. This most likely reflects the entrance of *nissei*, the children of the first generation of Japanese immigrants (*issei*),

into the plantation workforce. Japanese sources indicate that 31,720 Japanese left Hawaii for the U.S. mainland between 1902 and 1907.

14. Planter agents illegally provided loans of passage money to Korean immigrants. Such loans were often not repaid by the Korean immigrants in Hawaii (see Patterson 1988, pp. 100–101).

15. Patterson (1988, pp. 124–135) identified Korean competition with Japanese emigration companies as a primary motivation for Japan's action. Other Japanese motives could be to keep wages low in its soon-to-be protectorate of Korea; to reduce the number of Japanese migrating to California from Hawaii; and to establish tighter control over Korean affairs.

16. See McLaren (1951) for more details.

17. The 15,982 remaining in Hawaii is the sum of the net arrivals for 1906–1910 and 1911–1915.

18. We define skilled workers below. Unskilled workers are total workers minus skilled workers, overseers, and foremen.

19. The data reported in Table 4 only include workers for whom hours of work were reported. Thus, total number of workers reported in Tables 4, 5, and 6 are often substantially less than reported in Table 1.

20. See La Croix and Fishback (1989) for an analysis of the 1900/1901 data by plantation.

21. Unfortunately, hours per week were not reported for roughly 30 percent of the workforce. Since monthly earnings may vary considerably due to variation in hours worked, they are not as good a proxy for the wage rate as average hourly earnings. See La Croix and Fishback (1989) for an analysis of the monthly earnings data for 1900/1901.

22. Throughout the paper we refer to average hourly earnings as the “wage rate.”

23. As we noted earlier, the Korean workers were mostly recruited from cities and brought few agricultural skills with them to Hawaii.

24. We infer the additional experience from the smaller number of Korean and Puerto Rican workers employed in 1910 than 1905.

25. Complete regression results are available from the authors upon request.

26. Qualitatively similar results are found when we control for number of hours worked in the panel regression.

27. The percentage of Japanese workers in skilled jobs does increase, from 3.5 percent in 1902 to 6.3 percent in 1915, as the number of skilled jobs increased.

28. Complete regressions are available from the authors upon request.

29. Qualitatively similar results are found when we control for number of hours worked in the panel regression.

30. Japanese supervisors increased to 220 in 1910 despite the 1909 strike. The ensuing decrease in their numbers to 198 between 1910 and 1915 primarily reflected the tendency of Japanese workers to leave the plantation during this period.

31. The U.S. government was also interested in stimulating Caucasian migration to Hawaii. In 1906 the U.S. government asked the Board of Immigration why it was encouraging Korean immigration when it had been set up in April 1905 to encourage European immigration (see Patterson 1988, p. 165).

32. The California government began to impose restrictions on Japanese and Chinese ownership of land after 1913 (see Higgs 1978).

33. Bound labor was *voluntarily* bound. Unless information flows to new workers were extremely imperfect, contract terms had to represent Pareto-superior opportunities for workers to migrate.

34. In a simple profit-maximization problem, a single firm would import workers from the country with the lowest wage costs. If the supply of immigrants were perfectly elastic, there would be no deviation from competitive behavior. If the supply of immigrants were of finite elasticity, then fewer workers would be hired and they would be paid a lower wage than under free competition. See Blair and Harrison (1993, chap. 3) for a full analysis.

35. The rise in relative U.S. wages is primarily due to a decline in British real wages during World War I (see Williamson 1996).

36. The analysis uses only a single wage index for the home countries and, therefore, compares skilled wages in Hawaii to unskilled wages overseas.

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