

Gender Systems and Women's Labor Force Participation in the Salmon Industry in Chiloé, Chile

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Summary. — This paper, which follows the emergence of the salmon industry in the 1990s in Chiloé, Chile, demonstrates that factors restricting women's participation in labor force and wage differences between women and men are related to the gender systems operating in Chiloé. Results indicate that these systems reflect the territory's demographic and agrarian history and that local gender systems have a positive influence on women's participation in the labor market, though this is not accompanied by decreased salary discrimination in the salmon industry. The implication is that territory-specific and gender factors must be considered in national employment policies.

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Key words — female labor participation, gender systems, income differences, culture, Latin America, Chile

1. INTRODUCTION

The factors affecting women's participation in the labor force can vary from territory to territory. Economic growth tends to be more concentrated in areas characterized by agglomeration economies (Fujita, Krugman, & Venables, 1999; Krugman, 1980) and therefore tends to result in territorially differentiated labor market dynamics that include more women in the labor force in some territories than in others. Strategies that women use to become incorporated in the labor force, in particular their use of their social networks, also vary from territory to territory; this effect is seen even at the global level in economies that are increasingly interconnected (Castells, 2010). As a result, factors related to economic agglomeration, cultural elements, and characteristics of social networks as an expression of social capital help generate economic growth, poverty reduction, and income distribution in different ways in different territories. The gender system is one specific set of institutional characteristics strongly influenced by cultural attributes (Espino & Underhill-Sem, 2012; Fernández, 2013; Ridgeway & Kricheli-Katz, 2013). These gender systems often are the result of institutions that are endogenous to the territory, which explains their spatial variability.

This paper asks to what extent factors restricting women's participation in labor force vary geographically. Could territorially specific factors influence access to the wage labor market? If so, what would be the implications for thinking through the territorially specific and gendered effects of national employment policies?

By "labor force participation," we refer to transition into the salaried labor market. In addition the paper fully recognizes that when women are not part of the salaried labor market they are usually engaged in multiple activities that are also considered "work".

Except for a few periods of crisis, over the last 40 years Chile has experienced sustained and rapid economic growth, with increasing incomes and falling poverty rates and unequal income distribution (Bravo & Valderrama Torres, 2011; Contreras, 2003). This has coincided with the implementation of economic policies based on the opening of the economy to

trade and capital flows, the state's withdrawal from investment decisions, legal stability, and respect for property rights enshrined in the constitution, a strong commitment to macroeconomic equilibrium and deregulation of labor markets (Ffrench-Davis, Leiva, & Madrid, 1992). The results of this development strategy were high economic growth and a sharp and persistent drop in the poverty rate, but with income disparities not only among individuals, but also among municipalities (Modrego, Ramírez, & Tartakowsky, 2009). These patterns are particularly marked on the Chilean island of Chiloé, because of the profound structural changes in its economy following the establishment of the aquaculture industry during the 1980s. Chiloé, however, is not the only place where changes in investment strategies and economic innovation can be seen. In the 1980s, export agriculture in Chile's central valley and forestry in the southern central zone had already shown strong growth in investment and an increase in employment and women's participation in the labor market, changing gender relationships in Chile's rural sectors, albeit more so in fruit production than forestry (Barrientos, Bee, Matear, & Vogel, 1999; Valdés & Araujo, 1999).

Besides creating conditions for the expansion of domestic and foreign investment, the development model spurred significant changes in the institutional structure of labor. Labor rights decreased, creating a job market that was more dynamic and competitive, but also more precarious, with a particular impact on women's employment (Todaro, 2000). Finally, globalization yielded extra-regional benefits, but exacerbated social differentiation, increasing the cost of global integration at the local level (Barton & Murray, 2009). This is a result of globalization processes based on neoliberal regimes, and is distinct from processes shaped by social democrat regimes, such

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as Norway's, where the decision was made to create territorially balanced growth (Phyne, 2010).

The island of Chiloé is divided into ten municipalities. Six of them—Castro, Dalcahue, Chonchi, Curaco de Velez, Puqueldón and Quinchao—are located in the central part of the island and are most directly related to development of the aquaculture industry. These six municipalities have 79,000 inhabitants, 48% of whom live in rural areas. Castro is the municipality with the largest population on the island (29,000 inhabitants) and is the administrative center of the Province of Chiloé.

The new industry was introduced in a region with an incipient wage labor market, where the majority of the population engaged in subsistence agriculture, small-scale fishing, and seasonal migration. Except for a small dairy industry, there was no agroindustrial development in Chiloé in the 1950s. The main agricultural products were potatoes, wheat, oats and garlic, and animal production such as lamb; the main processed products were flour and *chicha* (an alcoholic drink made with apples) (Barret, Caniggia, & Read, 2002). Between September and March, men migrated to Argentinean Patagonia and Punta Arenas, Chile, to work in shearing, an exclusively male occupation. While the men were gone, women in Chiloé performed various farm tasks, such as planting potatoes, fertilizing wheat, caring for animals and gathering wood, as well as reproductive labor, but when the men returned to Chiloé, the traditional gender division of labor re-emerged with women ceasing to be active in field work for crop production (Grenier, 1984; Mansilla, 2006). With this seasonal male migration, the rate of female participation in Chiloé's labor force was only 26.5%, according to the 1982 Census. Barret *et al.* (2002) described Chiloé's rural community as homogeneous in cultural and class terms, with significant traditions of reciprocity and solidarity and with Catholicism as the predominant religion.

Our data show that the female/male sex ratio in central Chiloé rose from 1.0 in 1990 to 1.04 in 2009, and the marriage rate decreased from 0.76 in 1990 to 0.72 in 2009. One possible explanation for this change is that with industrial development in Chiloé, more men than women have arrived on the island; households of male–female couples have decreased and households headed by single women have increased.

The accelerated industrialization led to significant population growth in the territory, rapid increases in income (but without improved income distribution), and a considerable reduction in poverty, from 38.6% in 1990 to 12.4% in 2009. It is also argued that modernization processes have been accompanied by considerable environmental and cultural changes and impacts (Baldacchino, 2011, p. 154).

Development of the aquaculture industry in southern Chile, especially in Chiloé, followed experimentation and innovation initiated by the public sector and later sustained by the Fundación Chile, a private philanthropic body.¹ During 1990–2008, national salmon production increased from 29,000 to 600,000 tons a year, and Chile became the second-largest salmon producer in the world, with exports reaching US\$2.5 billion in 2008 (Salmon Chile, 2008). According to Barton (1998), the successful development of the salmon industry was driven by a unique set of hydro-biological conditions, counter-cyclical production methods, and low costs of production and transportation. Other authors have emphasized the comparative advantages of rather lenient environmental and labor regulations (Barret *et al.*, 2002) and liberal marine resource allocation regulations (Izuka, 2004; Katz, 2006).

The rapid changes that unfolded in Chiloé have had a strong influence on employment. Men stopped their seasonal out-

migration and began to join the emerging aquaculture industry, and young people and women were incorporated into the labor force on a massive scale. For example, women's participation in the labor force in the municipality of Ancud—the second most populated municipality in Chiloé—rose from 26.6% in 1996 to 48% in 2009. During the same period, women's participation in the labor force nationwide increased from 36.5% to 43% (CASEN, 2009). Different types of job emerged with the industry. Women became involved in different activities, with the main ones being administrative positions and industrial processing of salmon (Schurman, 2001).

Developing countries such as Chile tend to show lower labor participation rates for women compared to wealthy economies (Barrientos, 1997; Lovell & Vera-Toscano, 2004). Furthermore, limited participation by women in the labor force is a major reason for low household incomes (Contreras & Gallegos, 2011; Ferrada & Zarzosa, 2010; Psacharopoulos & Tzannatos, 1989). For example, in 2013 the rate of labor force participation for women from the first (poorest) decile was only 23%, while that of the tenth (wealthiest) decile was 63% (CASEN, 2009). One of the main strategies for combating poverty in Chile, therefore, has been to increase the rate of women's participation in the labor force (Abramo, Valenzuela, & Pollack, 2000).

This paper provides evidence for the factors that allowed the women of Chiloé to enter the labor force after the establishment of the salmon industry. The analysis is based on the assumption that women workers in the salmon industry were familiar with productive tasks, as they had already worked in agriculture, fishing, the collection of seafood products and handicrafts, because of the social, economic, and environmental characteristics of the territory, mainly because women assume both productive and reproductive roles during much of the year, when men migrate seasonally to Patagonia.

We assume that it shows that these relationships between women and production are crucial for establishing cultural systems that facilitate women's participation in the labor force, along with variables that typically explain women's participation in the work force, such as age, number of years of schooling, the presence of children in the household and marital status. It also shows the influence of the gender system on women's participation in the labor force.

These attributes were identified in this study by a field survey that was designed to establish whether they existed before the arrival of the salmon industry in Chiloé, and therefore before the point at which women entered the labor force. The evidence suggests that knowledge of agricultural work is the key factor that positively influences women's participation in the labor force. In contrast, knowledge of fishing, collection of seafood products or handicrafts decreases the likelihood that women will participate in the labor force.

This result is consistent with analyses of behaviors sustained by gender systems (Acker, 1992; Ridgeway & Correll, 2004). Both handicrafts and collecting seafood products have always been considered “women's work” in Chiloé, so these practices do not change the discourses or the domains with which women have traditionally been linked, namely the household and reproductive tasks. Women who play a role in agriculture, however, are seen as taking up new practices, moving beyond their traditional roles to perform tasks previously limited to men. This broadening of women's traditional roles helped with their inclusion in the work force when there was a sudden increase in demand for labor as a result of accelerated industrial development on the island.

We also provide evidence of a gender-based wage bias in the salmon industry by analyzing the breakdown of incomes. The

results suggest that economic growth in Chiloé is not consistent with a decrease in wage gaps, even when economic, social, and cultural conditions exist that facilitate greater participation by women in the salaried labor market. This result supports the suggestion that specific policies be developed to eliminate gender-based salary discrimination.

After this introduction, the rest of this paper is divided into six sections. Section two presents a literature review, and section three describes the data used to estimate labor participation and income level. The fourth section discusses the methodology. The results are described in the fifth section, and conclusions are presented in the sixth and final section.

2. LITERATURE REVIEW

Labor economists have used a variety of variables to explain women's decisions to participate in the labor force. These include education and experience, the opportunity cost of labor, the income of other wage earners in the household, the existence of taxes and subsidies, the presence of offspring or other children in the household, and the family life stage (Blundell & Stoker, 2007; Killingsworth & Heckman, 1986). Besides the traditional variables used by previous authors, factors related to social access, such as networking opportunities (Burns, Godlonton, & Keswell, 2010; Parks, 2004), and forms of cultural capital, such as machismo as a social behavior that limits women's participation, have also been considered in several recent studies (Contreras & Plaza, 2010; Stadelmann-Steffen, 2008). Cultural capital can also support the development of institutions that allow greater participation by women in the work force. For example, there is evidence that cultural change can be endogenous, through inter-generational learning by women who enter the labor force and who, in the long run, modify social behaviors in their families, passing on to their daughters new norms and beliefs that enable them to move more smoothly into the labor force (Fernández, 2013).

A number of studies of labor force participation have explored the reasons why women participate less than men. Nevertheless, standard models have failed to identify the reasons for women's lower participation in the labor force or the incentives for a shift toward greater access for this group (Blundell & Stoker, 2007). In different studies of labor force participation, models are adjusted to include the following set of specific conditions: women having children, women having partners, women receiving monetary subsidies, and the life cycle of women. These conditions were added to improve the empirical performance of these models, based on assumptions consistent with the hypothesis of individual utility maximization supported by the general model (Blundell & Stoker, 2007; Killingsworth & Heckman, 1986).

Previous studies of women's participation in the labor force described two factors of importance (Killingsworth & Heckman, 1986): commuting patterns that affect the male and female labor supply (Black, Kolesnikova, & Taylor, 2007), and cultural characteristics that affect female labor supply (Contreras & Plaza, 2010). But few if any studies directly addressed the extent to which values underlying gender systems served as structural factors determining the supply of labor.

Increasing participation by women in Chiloé's labor force (which is higher than the national rate and much higher than levels in similar rural municipalities, even those with well-developed export agriculture sectors) could be the result of particular gender relationships on the island. Specific relationships may have developed because of cultural adaptation

processes related to seasonal migration by men and the development of agriculture in the absence of male labor. The few existing studies of factors that might explain the increase in women's employment have referred only to changes in demand created by the aquaculture industry in the territory (Acker, 1992; Schurman, 2001). Those studies have not explored other "supply-side" and cultural variables that might provide a more complete explanation for the changes observed in Chiloé's work force.

In a qualitative study, Macé, Bornschlegl, and Paulson (2010) propose that one factor in the significant inclusion of women in formal employment on the island was the gender system that prevailed in Chiloé before the development of the salmon industry. Historically, women on the island have participated in both reproductive and productive work because of the migration strategy traditionally adopted by men (Urbina Burgos, 1996). This involvement of women in productive tasks could have facilitated their incorporation into the formal labor force in the salmon industry. One possible explanation is that as women replaced men in agriculture and other sectors (due to men's seasonal migration), the extent to which sexist beliefs or traditions limited women's participation in the labor force declined. According to Acker (1992), a gender system implies assumptions and daily practices based on a distinction between the sexes. It often has a negative impact for women (Medeiros & Costa, 2008), such as limiting access to paid work because of the assumption that women should focus more on reproductive than on productive tasks, or because of chauvinistic cultural conditions and beliefs that reduce their access to wage labor, even when it is performed within the household.

In general, the data needed to include such variables in models of women's participation in the labor force are not readily available, and various researchers seeking to explore these issues quantitatively have therefore used proxies in their models. For example, Contreras and Plaza (2010) incorporated proxy variables that characterized values (conservative or liberal) and women's perceptions regarding chauvinistic behaviors. Their results suggest that women living in chauvinistic cultural contexts in Chile are less likely to participate in the labor force.

As Contreras and Plaza (2010) noted, such models present problems of circular causality. For example, women's conservative values, or the chauvinistic cultures in which they live, can change because of their experience in performing wage labor. The money they earn, and contact with other people in the workplace, can lead to changes in the value placed on chauvinistic roles and conservative positions. The causality is therefore unclear. This problem can also be addressed by exploring women's positions with regard to values and chauvinistic culture before they enter the labor force.

Besides analyzing factors that explain women's participation in the labor force, many studies have examined the differences between men's and women's wages. Their aim is to separate wage differences into two interrelated components, one caused by attributes of male and female workers, and the other caused by factors related to gender-based discrimination (Brown, Moon, & Zoloth, 1980; Oaxaca, 1973; Oaxaca & Ransom, 1999). Some authors have generalized these models by including differences between men's and women's labor conditions and labor productivity in order to explain wage differences. According to that reasoning, "men's work" would have a higher reward because it is performed under more difficult conditions (Filer, 1985).

In a recent study in Chile, Montenegro (2001) found that men and women in the top quintiles who have more years of

education have higher incomes, but the same is not true of men or women in the lowest quintiles. Differences between men and women at the upper income-distribution levels cannot be explained by observable attributes of workers alone (Atal, Nopo, & Winder, 2009; Muñoz-Bullón, 2009). Paredes and Riveros (1994) use time series data to show that wage differences due to gender biases tend to diminish during periods of low unemployment in Chile. They suggest that anti-discrimination policies should be combined with strategies to encourage increased employment.

In the case of Chiloé, no data are available for assessing women's views about their values and culture in models of labor force participation. Based on qualitative data and historical analyses, however, Macé *et al.* (2010) proposed that gender systems in Chiloé increased the likelihood that women would participate in the work force because: (i) before 1990, livelihoods were mainly rooted in economies based on subsistence agriculture and small-scale tourism; (ii) seasonal migration of men was one of the few strategies available for income generation (Mancilla & Rehbein, 2007); and (iii) male seasonal migration left women responsible for both the household and childcare, as well as agricultural tasks generally considered "men's work," such as cutting wood, plowing, planting, and harvesting. Women were also responsible for tasks such as spinning wool, knitting, and making woolen handicrafts.

Those conditions indicate the interplay of gender systems on the island. Morrisson and Jütting (2004) suggest that both economic and non-economic indicators can be used to describe gender systems and the level of inequality in a country. For example, before the establishment of the aquaculture industry in Chiloé, the typical male migration rate could serve as an indicator for the proportion of households in which the gender system assigned responsibility for productive tasks to women when the men were absent. The same conclusion can also be reached by identifying the women who have practical knowledge of agricultural work because of seasonal migration by men. Such knowledge might serve as an indicator of a gender system in which discourses and actions are used to assign roles other than reproduction to women, implying that some social systems are less chauvinistic, but not necessarily less discriminatory, given the workload associated with assuming both productive and reproductive roles.

3. CASE STUDY AND DATA COLLECTION

To explore the economic and social dynamics (i.e., changes in poverty, employment history, income and equity) of the six municipalities of Chiloé, three sources of primary data were used: interviews, focus groups, and a representative household survey, supplemented by a review of the secondary literature, including newspapers.

The household survey was designed and conducted in the six municipalities in May and June 2009, in collaboration with Stanford University's Environment and Resources Program.

It covered 856 households in both rural and urban areas. The survey collected past and current social, economic, and work force information, as well as the respondents' opinions about various topics related to Chiloé's economic and social dynamics. The survey data collected at the end of 2008 included questions about activities in 2008 and 1990.

Table 1 is based on these survey data and shows the change in the number of women and men employed in the aquaculture and services sectors during 1990–2008. Of the 17,000 new jobs created in the aquaculture and services sector, 43% were held by women and 57% by men. The main type of employment that emerged with the salmon industry was in the services sector, where women obtained the same number of new jobs as men. In addition, 40% of all jobs in aquaculture and services went to women. The data show that a very high percentage of women in Central Chiloé who work outside the home are employed in the aquaculture industry and services sector (81%).

4. EMPIRICAL MODEL

Models of participation in the labor force assume that individuals define their levels of participation in an effort to maximize their utility, subject to restrictions on time and income. This generalized model predicts that an individual participates in the salaried job market when $W^* > W$ where W^* is the individual's shadow or alternative salary (Killingsworth & Heckman, 1986).

This study adapts the analytical framework developed by Contreras and Plaza (2010), which proposes that there is a link between women's participation in the labor force and individual attributes, such as family and cultural contexts. We propose the incorporation of attributes such as knowledge of agriculture, skills related to the collection of seafood products, handicrafts, and the traditions of Chiloé, which are interpreted as markers of cultural identity related to gender systems on the island. This knowledge helps women change their cultural perspective on the role of women in the economy. "Household" variables, such as the presence of a child under age 4 and marital status, are also included.

The econometric specification is as follows:

$$P(Y_i = 1) = \alpha + \beta A_{2008} + \lambda B_{1990} + \mu_i \quad (1)$$

where Y_i is a variable that takes a value of one when a woman participates in the labor force and zero otherwise. A is a matrix of variables such as education, age, age squared, household size, marital status, a dummy related to the area in which she lives (rural or urban), and the amounts of monetary subsidies received. B is a matrix of cultural and identity variables, and μ_i is an error term normally distributed with a mean at zero and a standard deviation equal to 1. α , β and λ are parameters of estimation.

One problem in estimating Eqn. (1) is the possibility of endogeneity if matrix variables of A or B are completed with information from the last year of the period of analysis,

Table 1. Aggregated indicators by gender

	Women	Men
Workers new to the aquaculture sectors (1990–2008)	2,193	5,049
Workers new to the service sectors (1990–2008)	5,456	5,281
Percentage of new workers in the aquaculture and service sectors held by women and men	43%	57%
Percentage of total jobs held by women and men	40%	60%
Percentage of workers who are employed in aquaculture and service sectors	81%	70%
Rate of labor force participation by gender	53%	85%

Source: Own data, Chiloé Survey, 2009.

because these characteristics can be an outcome of women labor force participation. For example, machismo can change as a result of women's participation in the labor force (Contreras & Plaza, 2010). In this study, endogeneity is controlled because all variables used in our models were gathered during the Chiloé survey, including data related to women and their relationship with the market labor and agriculture, fishing, handicrafts, and collection of seafood before 1990, prior to the expansion of the aquaculture industry, which began that year and peaked in 2008.

We supplemented our analysis of access to labor force by determining whether the existing salary differences between men and women in the aquaculture industry are a result of discrimination. We used the framework developed by Oaxaca (1973) and Oaxaca and Ransom (1994), who proposed a two-stage methodology. In the first stage, median salaries for individual i of the different groups g (males m and females f) are estimated using:

$$W_{gi} = \beta_g X_{gi} + \varepsilon_{gi} \quad (2)$$

where W_{gi} is the log wage and X_{gi} is a vector of control characteristics of an individual i of group g . In the second stage, the salary differences are divided into two parts: an unexplained component (U in Eqn. (3)), which we label "discrimination," and differences in worker-observed attributes (E in Eqn. (3)). If the differences in the unexplained component are significant, the hypothesis of salary discrimination is supported. The difference in mean wages can be written as:

$$\bar{W}_m - \bar{W}_f = (\bar{X}_m - \bar{X}_f)\hat{\beta}_m + (\hat{\beta}_m - \hat{\beta}_f)\bar{X}_f \equiv E + U \quad (3)$$

where \bar{W}_g and \bar{X}_g denote the mean log wages and control characteristics of group g , and $\hat{\beta}_g$ represents the vector of estimated parameters from Eqn. (2).

Variables defined in Eqn. (1) are: labor participation in the modern sector (=1 if a woman participates in the labor force and = 0 otherwise); age (between 15 and 65); years of schooling completed; having a partner (=1 if married or cohabitating and = 0 otherwise); knowledge of handicraft production (a dummy that has value of 1 if the woman has knowledge of handicraft production and a value of 0 otherwise); knowledge of agricultural production (a dummy that has value of 1 if the woman has knowledge of agricultural production and a value of 0 otherwise); knowledge of seafood collection (a dummy that has value of 1 if the woman has knowledge of practices such as seafood collection and a value of 0 otherwise).

The equation of salaries (Eqn. (2)) for both men and women was estimated using an OLS semi log regression model. The dependent variable was the logarithm of monthly salary income. The independent variables were age, being born in Chiloé, number of years of schooling, number of jobs, age squared, being a landowner or having access to land, being indigenous, participating in economic networks, participating in organizations, having knowledge of agricultural production, having knowledge of seafood, having knowledge of handicraft production, having knowledge of the traditions of Chiloé and a dummy variable for employment in salmon processing (1) or other jobs (0).

5. RESULTS

Table 2 shows key characteristics of the economically active population and describes the changes that occurred for men and women during 1990–2008 in six municipalities of Chiloé. The data are organized by the main source of employment

Table 2. Employment held by individuals aged 15–65 by gender, 1990 and 2008

1990	2008			Total
	Traditional	Modern	Inactive	
<i>Men</i>				
Traditional	4,811	1,571	1,045	7,427
Modern	762	5,796	842	7,400
Inactive	451	2,430	527	3,407
Arrived after 1990	325	1,922	529	2,776
Under 15 in 1990	1,254	6,011	1,431	8,695
Total	7,603	17,730	4,374	29,705
<i>Women</i>				
Traditional	1,961	560	262	2,783
Modern	58	2,721	1,188	3,967
Inactive	324	2,994	7,404	10,721
Arrived after 1990	35	1,127	841	2,004
Under 15 in 1990	265	4,214	3,096	7,575
Total	2,643	11,616	12,791	27,050

Source: Own data, Chiloé Survey, 2008.

Traditional: Salaried employment or self-employment in agriculture, fishing, or handicrafts.

Modern: Salaried employment or self-employment in the aquaculture industry and personal services, financial services, commerce, or public services.

Inactive: Not working or seeking employment.

The data refer to the sector of the economy in which the respondent conducted his or her main work for each year. Main employment is based on self-reporting. In 2008, 2.1% of the men and 2.6% of the women in the sample were unemployed.

for people between ages 15 and 65 (the age range for active employment, in accordance with official national statistics). Activities are grouped into three categories: traditional (small- or medium-scale fishing or agriculture), modern (aquaculture or the public or private service sectors), and inactive. The data show that the rate of labor force participation in 1990 was 92% for men and 37% for women. By 2008, these rates had shifted to 8% and 60%, respectively. This change in the labor force is very dramatic and may affect economic, social and cultural conditions in Chiloé. Table 2 also shows strong growth of employment in modern activities for both men and women. Furthermore, the data reveal that both men and women who came to Chiloé after 1990 or entered the economically active population after that date are mainly employed in the modern rather than the traditional sector.

Table 1 already showed that women occupied 43% of new jobs in the modern sector (a total of 7,649), which represents 81% of the new jobs for women created during 1990–2008. Moreover, 75% of women were hired by aquaculture companies to work in processing plants (as operators), whereas only 36% of men were hired for those positions (although overall, 2,300 men hold those jobs compared to just 1,900 women).

These changes reflect the productive shift that occurred in Chiloé after the arrival of the aquaculture industry in the 1990s. Barriers to entry for jobs in the aquaculture industry were low, and there generally was no discrimination against women or young people. This extensive industrial development essentially eliminated the need for men to migrate to find work, and women benefited by earning wages, although they also continued their unpaid household reproductive activities (Macé et al., 2010).

To determine which factors define women's participation in the labor force, Eqn. (1) is estimated from the data obtained in the Chiloé survey. First, the universe is defined for estimation of the Probit model; all women of working age engaged in paid labor in the modern sector are compared with those not in the

work force. Five different specifications are then used (see Table 3). The process begins with a baseline model (Column 1). Columns 2–4 incorporate the variables mentioned in the literature as factors that explain the labor supply of women.

The results of the model are shown in Table 3. The first four columns contain results that are consistent with the theory and with the published work of previous authors (Black *et al.*, 2007; Contreras & Plaza, 2010; Killingsworth & Heckman, 1986). Age is found to be a positive and significant indicator, older women are more likely to enter the job market, but the effect of age has a limit (age squared is negative and significant). The number of years of schooling has a strong positive influence on the likelihood of a woman entering the job market, as does living in an urban area. Women who have partners (married or cohabitating), however, are less likely to have salaried employment. Having children under age 4 in the household and receiving monetary transfers have negative signs, as expected, but they are not statistically significant in any of the five specifications.

Table 3 also shows the effects of the variables we introduced to characterize the prevailing gender systems in Chiloé before the arrival of the aquaculture industry. As argued above, women in Chiloé were involved in both reproductive and productive roles before the salmon industry arrived, because of the absence of men due to seasonal migration. Because men were absent, women familiar with farm production were forced to perform agricultural tasks traditionally assigned to men.

The results show that a woman who is familiar with agricultural work is more likely to enter the job market, while knowledge of seafood collection has a negative influence that is not significant. Finally, knowledge of handicraft production has a negative and statistically significant relationship with women’s employment in the modern sector. The fact that knowledge as an indicator of work experience in seafood gathering or handicrafts, is not correlated with a greater likelihood of participation in employment in the industry is explained in our model because both activities traditionally have been

women’s tasks. Work experience in these activities does not reflect a change in the traditional gender and value system, while working in agriculture does. One possible reason explaining why some women who engage in agricultural tasks when their husbands are absent do not take up salaried work might be that the experience of agricultural labor strengthens their sense of self-worth, and that this in turn leads them to resist labor market incorporation and to remain in traditional activities.

This result is consistent with the opinions gathered in our interviews. One public employee noted in an interview that activities understood as being “women’s” have mainly consisted of “maintaining the household,” including children’s education, caring for animals, tending the garden, cooking, and gathering shellfish and algae. Women’s typical tasks also include spinning, weaving, and making woolen handicrafts. However, he noted, women have also come to perform all those agricultural tasks typically classified as “men’s” work: cutting wood, plowing, planting, and harvesting, especially if the male work force was absent for longer than expected.

From the standpoint of a Chiloé woman working in the salmon industry, women have been accustomed to “hard work,” which enables them to withstand the demanding physical labor conditions in the industry. With a long history of taking on men’s work as well as their own during periods of male seasonal migration, women became accustomed to the long workdays required for wage labor, as well as to cooking, washing, cleaning, childcare, and other reproductive tasks related to the family. As one anthropologist from the island put it, because women had to take responsibility for their households in both the reproductive and productive spheres when men migrated, “women know how to do all the tasks that men do, while men do not know how to do all of the tasks that women do.”

The results in column 5 also include a variable that distinguishes women who were born in Chiloé or have lived there since before 1990 from those who arrived after that date. The results show that there are no statistically significant differences between the two groups of women, although the sign

Table 3. Estimation of the participation of women in the modern sector

	1	2	3	4	5
Age	0.046* (0.027)	0.079*** (0.022)	0.078*** (0.021)	0.084*** (0.022)	0.079*** (0.025)
Years of schooling	0.069*** (0.024)	0.069*** (0.024)	0.069*** (0.023)	0.075*** (0.021)	0.085*** (0.020)
Age squared	-0.001** (0.000)	-0.001*** (0.000)	-0.001*** (0.000)	-0.001*** (0.000)	-0.001*** (0.000)
Type of area (urban = 1)	0.418*** (0.088)	0.438*** (0.083)	0.437*** (0.084)	0.452*** (0.087)	0.676*** (0.136)
Has partner = 1		-0.583*** (0.155)	-0.581*** (0.154)	-0.671*** (0.173)	-0.636*** (0.207)
Has children under four			-0.015 (0.114)	-0.010 (0.115)	0.008 (0.087)
Transfers (\$/month)				0.000 (0.000)	-0.000 (0.000)
Knowledge of handicrafts (1 = Yes)					-0.217 (0.153)
Knowledge agricultural work (1 = Yes)					0.612*** (0.178)
Knowledge of seafood collection methods (1 = Yes)					-0.174 (0.124)
Born or arrive Chiloé before 1990 (1 = yes)					-0.058 (0.167)
Constant	-1.569 (0.472)	-1.942 (0.441)	-1.929 (0.431)	-2.063 (0.435)	-2.455 (0.543)

Notes: Robust standard error in brackets; * statistically significant at 10%; **5%; and ***1%.

for the parameter is negative. This reinforces the idea that women are more likely to participate in the salmon industry work force when men migrate seasonally and women take on agricultural tasks; in other words, two factors must coincide: seasonal migration of men and access to land for farm production. By extension, households in which there is no seasonal migration, or where there is, but the households lack access to land for farm production, gender relationships do not change, and women in those households are less likely to participate in wage labor in the salmon industry. One extension of this analysis is that different gender systems coexist in the territory. The particular characteristic of Chiloé is the widespread nature of gender relationships in which women participate in reproductive household tasks and agricultural production, replacing men during much of the year.

These results have several implications. First, gender systems might have a positive influence on territorial dynamics through the cultural capital of the old gender system, which provided women with the skills, abilities, and predispositions necessary and self confidence to work successfully in the modern sector, because of their previous experience in non-traditional productive roles when men were absent because of seasonal migration. Opportunities to pursue non-traditional productive roles increased after the aquaculture industry arrived on the island.

Although women perform the usual agricultural tasks, such as tending animals or producing vegetables for household consumption, in Chiloé they also take on tasks associated with men, such as planting or harvesting potatoes, threshing wheat, selling animals, etc. These are the productive roles that women are forced to assume in the absence of men. Secondly, one reason for the industry's rapid expansion could have been the presence of a large number of women who had experience in physically demanding jobs and, more importantly, who had overcome cultural constraints that might have hampered their speedy incorporation into the labor force.

Cultural conditions that specifically influenced gender systems in Chiloé were a decisive factor in the aquaculture industry's rapid development. These cultural conditions and gender systems are explained by characteristics specific to the territory, related to both its particular history, which saw early involvement by women in both reproductive and productive roles, and the fact that the early involvement of women in productive roles enabled them to develop skills that facilitated their rapid entry into the industrial work force. To determine whether women receive salaries similar to those of men once they join the job market, we used the survey data to identify the men and women who worked as operators in the aquaculture industry. The total differences between men's and women's salaries were US\$200 per month, with men receiving US\$560 per month and women about US\$360 per month.

Table 4 shows the breakdown of salary differences between men and women using the method developed by Oaxaca

(1973). We present two estimations, one reached without controlling by employment type and the other controlling by type of employment. The results are consistent with the hypothesis of salary differences in favor of men as a result of discrimination (specification N°1). In other words, women who have similar attributes receive a lower salary, even though men and women perform identical work in the salmon industry (specification N°2). Simply put, women receive lower pay for the same work. The outcomes are slightly higher than wage differences reported by Schober and Winter-Ebmer (2011) for men and women working in Chilean export manufacturing.

This wage difference between men and women, which is neither a result of observable attributes nor related to productivity, can be explained in several ways. Macé *et al.* (2010) present an argument linked to the concept of gender stereotypes in western modernity (Ridgeway & Correll, 2004), in the sense that knowledge that can be classified as "belonging to women" is less valued in Chiloé society than knowledge that "belongs to men." Economists have also argued that wage differences may reflect unequal opportunity costs for men and women at the beginning of industrial development—a differentiated position that has remained unchanged over time. One possible explanation is that these opportunity costs are higher for men because they used to migrate and handled the money earned from paid employment themselves, while women handled fewer monetary resources, even though they took control of some productive tasks, because a significant proportion of the income from agricultural production was spent directly on family consumption. In other words, men could migrate to Patagonia if wages offered by the salmon industry were not competitive with wages from seasonal labor. Women, however, had no alternative employment. Finally, a third explanation highlights the heterogeneity of the types of work in the aquaculture sector. For example, a worker—male or female—who fillets salmon earns slightly more than an operator—male or female—on the processing line. Someone who works with machinery or computers or as a supervisor also earns more, because of the additional responsibility or the complexity of the work. This suggests that there is no explicit gender-based discrimination, but rather an implicit difference (inequality), because jobs with higher salaries tend to be performed by men (Macé *et al.*, 2010), probably because gender discrimination means women have less training in the use of machines or computers. But the results suggest that the final explanation is not correct, because when we control our model by types of job, differences between men and women persist.

6. CONCLUSIONS

This paper contributes to knowledge about how the specific conditions of gender systems in Chiloé allowed for the rapid incorporation of women into the labor force, a phenomenon made more dynamic by the establishment of the salmon industry in the 1990s. The rapid expansion of aquaculture on the island was due not only to significant extraterritorial investment, but also to the presence of a large number of women who faced no cultural barriers to their entry into the job market. This absence of barriers was related to the specific previous experience of local women, mainly in agriculture, which prepared them for work in aquaculture. It also resulted from a gender system of norms and relationships that did not block this access.

The variables generally studied as factors explaining women's participation in the labor force act as expected in Chiloé. Age, education, and living in an urban area increase

Table 4. Salary differences between men and women

Source of differences	Specification 1	Specification 2
Human capital	0.030 (0.075)	0.014 (0.08)
Discrimination	0.329*** (0.115)	0.222* (0.121)

Notes: The results correspond to a breakdown of salary differences for men and women.

*** Implies that the parameter is statistically significant at 1%.

* Significant at 10%.

the likelihood that a woman will join the labor force, while having a partner reduces that likelihood. In contrast to the findings of previous studies, however, having children under age 4 in the household and receiving cash transfers do not have a statistically negative effect on women's participation in the labor force. We assume that this effect is linked to gender systems, as women can and want to engage in different productive and reproductive roles.

The results show that conditions specific to territories can imply the development of institutions—for example, cultural institutions in the form of gender systems—that can facilitate or hinder productive transformation processes. In the case of Chiloé, particular institutions in the territory were decisive factors in dynamics of growth and more equitable access to employment for women. The results indicate a need for space-based policies, in addition to those for individuals, to include spatial heterogeneity in the design and implementation of economic and social development policies.

These results suggest that policies for increasing women's participation in the work force could include proposals in classic social policy areas, such as education and the availability of safe childcare. These could supplement other efforts to

promote cultural changes in society to achieve the potential of women's contribution to the labor force, such as increased formal primary and secondary education for girls and specific programs to change traditional values related to women's roles in society.

Although women are entering the job market in large numbers and prevailing gender systems on the island support this integration, wages in the industry remain discriminatory. The evidence suggests that the differences between men's and women's wages cannot be explained by observable characteristics. Three possible explanations emerge: gender-based discrimination in wages, even when there is no discrimination in entry into the labor force; implicit wage discrimination due to gender-based job specialization (i.e., women receive lower wages because of gender biases in the allocation of tasks within the industry); and wage differences linked to opportunity costs (shadow wage), men have a positive opportunity cost in wage employment (migration) and women do not, with their main alternative being to work as unpaid family labor in agriculture. This disparity has been transmitted over time and is a possible explanation for the observed differences.

NOTES

1. Fundación Chile is a non-profit private corporation whose partners are the Chilean government and BHP-Billiton – MineraEscondida.

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