Seafood Processor Preferences for Hiring Non-Immigrant Labor: A Conjoint Analysis

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Abstract: Labor is a major component in the Seafood processing industry and much of the labor is foreign born. Seafood processor preferences for hiring employees are explored in light of references, wages, and immigrant situations. The objectives of this study are to determine the relative importance of labor attributes, and to identify distinct clusters of processors in terms of preference for immigrant labor using conjoint analysis. Results from this study indicate that for seafood processors wage is the most important factor in hiring labor, and visa status is the least important factor when hiring seafood workers.

Keywords: Seafood Processor, non-immigrant labor, H-2B visa, conjoint analysis, cluster analysis

Introduction

Louisiana is the largest seafood producing state in the contiguous United States (Harvey, 2005) and it is the largest producer of oyster, shrimp, crab, crawfish and alligator in the United States (Louisiana Seafood). The fisheries, wildlife and boating resources of Louisiana are an important part of the state economy. One out of every 70 jobs in Louisiana is seafood-related with a total economic impact of over $2.4 billion (Louisiana Seafood). Many of these jobs are in family-owned companies that have worked for generations to bring the seafood to domestic and world markets. These jobs and natural resources are of great value not only to the industry and local businesses, but also to residents and communities in Louisiana.

The seafood industry in Louisiana, however, has faced a multitude of challenges over the last two decades. Beginning in the early 1990s foreign produced seafood products stormed the domestic market, exposing Louisiana producers to fierce competition against foreign producers who rely on much lower-wage labor. The seafood processing industry relies heavily on immigrant labor that usually comes to the US via H-2B visa program. Since 2005, the Louisiana seafood processing and packaging industry has employed a considerable number of H-2B visa workers (more than 2,500 per year), temporary workers hired for seasonal industries from other countries, mainly Mexico and Central America.

U.S. Department of Labor (DOL) officials proposed higher wages for H-2B visa workers in January, 2012, after a federal court struck down guidelines for the program crafted by the Bush

administration. Under the new rules, H-2B visa workers in Louisiana who now make $8.07/hour would receive $14.77/hour. This mandated change in wages would put a significant burden on employers of H-2B visa workers.

Therefore, recognizing the need for market analysis of immigrant labor, the objectives of this study are twofold. First, we determine the relative importance of labor attributes most valued by seafood processors, including visa status. Second, we identify distinct clusters of processors in terms of preference for immigrant labor (H-2B visa workers).

2. Conjoint Analysis

Conjoint analysis is a method used to elicit prospect consumers' preferences for goods or services. This is among the most popular research method in the marketing area since early the 1970s. The conjoint method has been utilized in diverse areas, such as market segmentation, industrial marketing, pricing, and advertising (Gustafsson et al., 2000). The main assumption of conjoint analysis is that all goods have important traits, and these traits can be measured as values. The goal of the conjoint analysis is to examine how consumers value the degree of preferences according to each trait. It is appropriate for understanding consumers' reactions to and evaluations of predetermined attribute combinations that represent potential products or services (Hair et al., 2006).

The part-worth function model is a commonly used conjoint model. The utility representing total worth or overall preferences of certain products or services can be aggregated from what the product parts are worth, or part-worths (Hair et al., 2006). It provides the diverse flexibility with different shapes of the preference function along with each of the characteristics (Green & Srinivasan, 1978). Following (Lewis & Gillespie, 2007):

$$R_j = \beta_1 X_{1j} + \beta_2 X_{2j} + \cdots + \beta_n X_{nj} \quad (1)$$

where R_j shows the rank from profile j, X_{nj} are attributes, and β_n are part-worth values of the attributes. It is assumed that the total preference is the sum of each part-worth and the attributes are independent of each other (Keeney & Raiffa, 1993). The part-worth estimates of the preferences of the individual can be estimated for any combination of factors, and the preference structure would reveal the most important factors to determine overall choice (Hair et al., 2006).

There is little available research-based information dealing with seafood processor preferences for labor. Lewis and Gillespie (2007) studied crawfish processor preferences for a potential peeling machine using a conjoint analysis. Among five attributes, most preferred machine deveined, retained the

hepatopancreas, did not require individual handling of crawfish, retained the backstrap, and was owned rather than leased. Harrison et al. (2002) studied consumer preferences for consumer-ready crawfish products using two-limit Tobit (TLT) and ordered probit models. A number of studies using conjoint analysis have focused on consumer preferences for seafood (Bacon et al. (1991): farm raised seafood products; Halbrendt et al. (1992): farm-raised hybrid striped bass; Anderson & Bettencourt (1993) and Holland & Wessels (1998): fresh salmon). However, it should be pointed out that the literature falls short on labor preference studies. In particular, to best of our knowledge, no study has investigated labor hiring preference in the context of seafood processing industry. This study fills an important gap in the literature and findings from this study can be used by extension agents, seafood processors, researchers and policymakers to better serve the community and design policies that are proven through theory and sound empirical findings.

3. Survey Data

A survey of seafood processors was developed to collect data for a number of issues related to seafood industry, hired labor (both H-2B visa workers and domestic workers), income and costs of the seafood processing firm. The questionnaire had two sections dealing with: (1) the general questions about labor, migrant workers, and federal regulation, and (2) ratings questions for hiring preferences. The survey was funded by Louisiana Sea Grant. The survey questionnaire was sent to Louisiana seafood processors. A list of seafood processors was obtained from the Louisiana Department of Health and Hospitals (LDHH). Initially, 337 surveys were sent, but majority of the seafood processors listed on that list were either out of business or were no longer employing immigrant labor. Louisiana Department of Wildlife Fisheries (LDWF) confirmed that there were only 70 seafood processing companies in Louisiana. This resulted in 37 completed surveys, a 53% response rate.

The total response is comprised of 36 seafood processors. For the conjoint analysis, responses that were missing or unreliable (i.e., negative values, or all values equal to zero), are excluded. As a result of these exclusions only 24 firms were used for conjoint analysis. Table 1 describes the summary statistics of important variables. An average of 23 U.S. domestic workers and 36 Mexicans were employed in 2011. When comparing the average wage and piecemeal wage rate between H-2B and non H-2B employees (including U.S. and non H-2B immigrants), the survey found that non H-2B employees earned higher wages and piecemeal wage rate than H-2B visa workers. The survey found that, in 2011, the average labor costs account for 21-40% of the total cost. Finally, both the average total expenses related to the seafood business and gross sales of seafood, in 2011, were between $1,000,000-$3,000,000.

The above analysis is just based on the average reporting of the data. It does not reveal any preference for hired labor force, domestic or H-2B visa workers from abroad. One can gain valuable information on the choice of hired labor through conjoint analysis. Using conjoint analysis[1], the preferences of Louisiana seafood processors in hiring a worker is analyzed. Conjoint analysis assumes that consumers have a different utility as the attributes of products. Utility is the numerical score representing the satisfaction a processor gains from hiring a worker, and serves as the dependent variable in a conjoint model. Attributes considered in the model are *immigrant* visa status (U.S. citizen, immigrant non H-2B, H-2B immigrant), *references* (excellent, mediocre, poor), and *wages* (\$15/hr, \$11/hr, \$8/hr). More specifically, the seafood processors' preference for hired labor is defined as:

$$U_p = f(\text{ Immigrant Status, References, Wage}) \quad (2)$$

where U_p the utility of a processor, and this is is composed of attributes: immigrant status, references, and wage. These three representative attributes were included after being discussed with seafood processors. Since the paper focuses on the non-immigrant and immigrant labor effects, immigrant status is an essential factor for us and one of the arguments in the utility function of seafood processors. When hiring employees, references and wage levels are also taken into consideration by the processors. Since the study collects three attributes and each attribute has three levels, there are 27 profiles (3*3*3=27) in the factorial design. However, it is cumbersome for respondents to rate all 27 profiles. Therefore, a fractional factorial design was determined to diminish the number of profiles. The fractional factorial design abstracts main effects and can minimize ambiguity for the respondent and maximize selected choice validity (Lewis and Gillespie, 2007).

The fractional factorial design yields 9 profiles from the possible 27 profiles. Two holdout profiles are added, for a total of 11 profiles. For conjoint analysis, seafood processors were queried on the hiring preferences, specific questions are shown table 2. To determine the significant preference attributes for hiring employees, a two-limit Tobit (TLT) model was used. We adopt the TLT model since the ordered probit model is not appropriate when degrees of freedom are small. The TLT model is as follows (Verbeek, 2000):

$$\begin{aligned} y_i^* &= x_i'\beta + \varepsilon_{i,} \quad i = 1,2,\dots,n \\ y_i &= L_{1i} \quad if\ y_i \le L_{1i} \\ y_i &= y_i^* \quad if\ L_{1i} < y_i^* < L_{2i} \end{aligned} \quad (3)$$

[1] A Conjoint Analysis, well documents in the consumer preference studies estimates preferences among the diverse characteristics that had owned by products and services (Cattin and Wittink 1982).

$$y_i = L_{2i} \quad if\ y_i^* \geq L_{2i}$$

where $\varepsilon_i \sim N(0, \sigma^2)$, y_i^* is the latent variable, y_i is the dependent variable, and x_i is the independent variable. L_{1i} and L_{2i} are the lower and upper limits, respectively, of the model. The sum of the part-worth value is the aggregated worth value.

Cluster Analysis

Preferences can be different between groups. Cluster analysis enables aggregated group who have similar characteristics to be compared with another aggregated group—both from the same data. It is a multivariate method that assesses the similarities between units in order to create homogeneous groups (Hair et al., 1998). After using cluster analysis, we can investigate the structure of each group. The main standard for clustering is the similarities of responses or distance between cases.

The two main methods for clustering are the hierarchical and nonhierarchical methods. The hierarchical method organizes the set of clusters using a treelike step. The hierarchical method uses two methods: the agglomerative method and the divisive method. The agglomerative method assumes that each respondent forms one cluster and, after clustering, it connects the most similar two clusters and makes a new cluster than finally in the sample all respondents can form one cluster. The divisive method assumes that each respondent forms one cluster and, after clustering, it divides the respondents who have lower similarities to smaller cluster than finally in the sample all respondents can form each cluster (Hair et al., 1998).

Unlike with a treelike hierarchical method, the nonhierarchical method yields a single cluster solution based on the number of specified clusters (Hair et al., 1998). It yields some clusters and makes a center of cluster. Then if the respondents are less than certain distances then they can include that cluster. Since this method is mainly used for K clusters for respondents instead of variables, it is called K-mean clustering. This study used the nonhierarchical method due to limited number of observations (Lewis and Gillespie, 2007). Based on the cluster analysis, two or more group is founded. After cluster analysis, the conjoint analysis is conducted by cluster group.

5. Results and Discussion

With a base immigrant status level of "U.S. citizen" results in Table 3 indicate that domestic employees were preferred to immigrant employees who were non-H-2B visa holders. With a base references level of "excellent", a potential employee with excellent references was preferred to one with mediocre or poor references. An interesting finding from this study is that, with a base wage level of

$15/hr—higher wages, lower wages were preferred to higher wages. These findings suggest that indeed wages are the driving factor in hiring labor by seafood processors.

Table 4 shows the relative importance of the three attributes (immigration status, references, and wagers). Parameter range (column 2) shows of the part-worth estimates among the three specific attributes from each criterion. Seafood processors were most concerned about wage, at 42.4% importance. The second important at 30.2% was references, followed by immigrant status, at 27.5%. Findings here suggest that seafood professors are most sensitive to labor costs, therefore, new polices, such as restriction on immigration and/or increased wages for H-2B visa workers could have a negative impact on processor's utility and perhaps leading to reduced profits.

The parameters obtained in table 3 could be used to calculate the overall rating of a potential employee and rank potential employees from 1 to 27 (27=3*3*3) combinations. Seafood processors prefer employees who have U.S. citizenship and excellent references at a wage of $8/hr for an average utility of 8.024 points (table 5). They highly appreciate the low wage regardless of the immigration/citizenship status. Thus, as seen in table 5, the top 4 profiles for seafood processors indicate the choice of low wages. References are also an important factor. Excellent references are preferred to mediocre references. Conversely, immigrant employees who do not have an H-2B visa, have poor references, and are to be paid higher wage are the least preferred choice by seafood processing employers.

Prior to the cluster analysis, ordinary least squares (OLS) regression was conducted to estimate the coefficients for each of the 24 seafood processors[2]. Since the number of observations is small, the two limit Tobit (TLT) could not be estimated for individuals observations, due to lack of degrees of freedom. Based on the OLS estimated coefficients we then conducted a cluster analysis. Two groups were created, the first group, *Group 1*, with 9, and the second group, *Group 2*, with 15 observations, respectively. Conjoint analysis was then conducted for each group and Table 6 reports conjoint analysis using the TLT method. For both of the groups, the H-2B immigrant status was not significantly important to determine hiring. In the case of Group 1, wage was relatively more important than for Group 2; for Group 2, references were more influential factors in hiring labor by seafood processors.

Based on the estimated coefficients from the conjoint analysis, we can explore the preferred traits by groups. As seen in Table 7, Group 1 was most concerned about wages, Group 2 was most concerned about references. To determine the main differences between two groups, we conduct the *t-test* within the two groups. A t-test is used to test for differences between the two means, μ_1 and μ_2. The null hypothesis

[2] Readers interest in the OLS coefficients can obtain it from the authors.

for the *t-test* is $H_0 = \mu_1 - \mu_2 = 0$, and the alternative hypothesis is $H_1 = \mu_1 - \mu_2 \neq 0$. Since the two samples are drawn from the same population and have different observations, unpaired with equal variances *t-test* is used. We select certain variables which are hypothesized to affect hiring preferences, such as: total hired employees, labor costs as a portion of total costs, total expenses, gross sales, and whether the respondent spoke Spanish. Table 8 reports the result of *t-test* (last column). Results indicate that the two groups are not significantly different at the 95% level of significance. However, gross sales is statistically significant different between the two groups.

6. Conclusions

The Louisiana seafood processing and packaging industry heavily relies on the H-2B visa workers (more than 2,500), temporary workers hired for seasonal work, mainly Mexico and Central America. The U.S. Department of Labor (DOL) proposed higher wages for H-2B workers in January, 2012, after a federal court struck down guidelines for the program crafted by the Bush administration. To determine the important factors considered in hiring seafood workers, the study used conjoint analysis with three main attributes: *immigration status, references, and wages*, by seafood employers. The study finds that wage was the most important and immigration status was the least important attribute in making hiring decisions. Therefore, an increased wage for H-2B visa employees would affect the hiring situation; if the increased wage of H-2B visa workers is higher than the current wage for U.S. citizen and non H-2B visa workers, then the new policy would lower the utility of seafood processors. Indirectly, one can surmise that if the Department of Labor forces the seafood processors to pay higher wages to H-2B workers than the increased wages would cause burden for seafood processor employers and it may result in smaller profits for seafood processors. Perhaps, forcing some business owners to move or quit the business altogether.

Finally, cluster analysis reveals two distinct groups of seafood processors. Each group has different preferences. For example, Group 1 is most concerned about wages—wages play an important role in hiring seafood workers; Group 2 is most interested with references. That is references play an important role in hiring seafood workers. After comparing select characteristics between the two groups, our study finds that compared to Group 1, Group 2 has higher gross sales, perhaps suggesting that quality workers, assuming that, in addition to other attributes, employers hiring workers based on references, help in increasing sales of the firm.

7. References

Anderson, J. & Bettencourt, S., 1993, A Conjoint Approach to Modeling Product Preferences: The New England Market for Fresh and Frozen Salmon, *Marine Resource Economics*, 8, 31-47.

Bacon, J.R., Halbrendt, C.K. & Toensmeyer, U.C. 1991, A Conjoint Analysis of Consumer Preferences toward Farm-raised Seafood Products. *Journal of Food Distribution Research*, 22, 116-117.

Cattin, Philippe, Alan Gelfand, and Jeffrey Danes, 1983, A Simple Bayesian Procedure for Estimation in a Conjoint Model, *Journal of Marketing Research*, 20, 29-35.

Gustafsson, Anglers, Andreas Herrmann, and Frank Huber, 2000, Conjoint measurement: Methods and applications. Berlin: Spring-Verlag.

Hair, F. Josept, William C. Black, Barry J. Babin, Rolph E. Anderson, and Ronald L.Tatham, 2006, Multivariate Data Analysis, Sixed edition, Pearson education.

Halbrendt, C. K., Bacon J.R. & Pesek, J., 1992, Weighed Least Squares Analysis for Conjoint Studies: The Case of Hybrid Striped Bass, *Agribusiness*, 8, 187-198.

Harrison, R. W., Gillespie, J. & Fields, D., 2005, Analysis of Cardinal and Ordinal Assumptions in Conjoint Analysis, *Agricultural and Resource Economics Review*, 34, 238-252.

Harrison, R.W., Stringer, T. & Prinyawiwatkul, W., 2002, An Analysis of Consumer Preferences for Value-added seafood Products derived from Crawfish. *Agricultural and Resource Economics Review*, 31, 157-170.

Harvey, David J. 2005. Aquaculture Outlook. United States Department of Agriculture. http://usda01.library.cornell.edu/usda/ers/LDP-AQS//2000s/2005/LDP-AQS-10-06-2005.pdf

Holland, D. & Wessells, C. R., 1998, Predicting Consumer Preferences for Fresh Salmon: The Influence of Safety Inspection and Production Method Attributes, *Agricultural and Resource Economics Review*, 27, 1-14.

Keeney, R.L. & Raiffa, H., 1993, Decisions with Multiple Objectives: Preferences and Value Tradeoffs. Cambridge University Press, Cambridge.

Lewis. J. Darius and Jeffrey M. Gillespie, 2007, "Crawfish Processor Preferences for the Adoption of a Potential Crawfish Peeling Machine: A Conjoint Analysis," *Aquaculture Economics & Management*, Vol 11:355-369.

Louisiana Seafood, http://louisianaseafood.com/seafood_jobs.

Paul E. Green and V. Srinivasan. 1978. "Conjoint Analysis in Consumer Research: Issues and Outlook," Graduate School of Business Stanford University, Research Paper No. 435.

Verbeek, M., 2002, A Guide to Modern Econometrics. Wiley & Sons, West Sussex, England.

Table 1. Data descriptions for main variables

Variable	Observation	Mean	Std. Dev.
Number of employees from U.S. 2011	13	22.923	32.343
Number of employees from Mexico in 2011	12	36.167	25.929
Number of employees from other countries in 2011	1	10.000	-
Average wage for non H-2B workers in 2011	14	10.640	3.452
Piecemeal ($/lb) for non H-2B worker in 2011	4	1.913	0.269
Average wage for H-2B workers in 2011	10	8.657	1.381
Piecemeal ($/lb) for H-2B in 2011	6	1.833	0.175
Employee turnover rate (%)	16	21.250	23.202
Portion of labor cost*	24	3.167	1.308
Total 2011 expenses related to seafood business**	19	6.368	4.179
Gross sales of seafood in 2011**	15	6.667	4.220

1) *The unit of the portion of labor cost is 6 categories. 1 is 0%, 2 is 1-20%, 3 is 21-40%, 4 is 41-50%, 5 is 51-60%, and 6 is over 60%.
2) **Total 2011 expenses related to seafood business and Gross sales of seafood in 2011 are in the 18 categories from less than $50,000 to greater than 25,000,000.

Table 2. Questionnaire on the hiring preferences

Please consider the following attributes of employees that you may hire for your seafood processing operation.

- Immigrant status: U.S. citizen, H-2B immigrant, or non H-2B immigrant.
- References: excellent, mediocre, or poor.
- Required wage: high ($15/hour), medium ($11/hour), or low ($8/hour).

On the basis of **immigration status, references,** and **wage**, please describe the *most favored* employee you could hire, worthy of a rating of **"10."**

_____

Now, using the same criteria, please describe the *least favored* employee you could hire, worthy of a rating of **"0."**

_____

Assume all other potential employees fall between **"0" and "10."** Please examine the 11 alternative employees below, and rate them on a scale between 0 and 10, where 10 *would be your most favored employee* and *0 would be your least favored employee* as described above.

Employee Description	Your rating
1. Native U.S. citizen with excellent references, wage=$8/hr	
2. Native U.S. citizen with poor references, wage=$11/hr	
3. Native U.S. citizen with mediocre references, wage=$15/hr	
4. H-2B immigrant visa with mediocre references, wage=$11/hr	
5. H-2B immigrant visa with excellent references, wage=$15/hr	
6. H-2B immigrant visa with poor references, wage=$8/hr	
7. Immigrant with no H-2B visa with poor references, wage=$15/hr	
8. Immigrant with no H-2B visa with mediocre references, wage=$8/hr	
9. Immigrant with no H-2B visa with excellent references, wage=$11/hr	
10. Native U.S. citizen with mediocre references, wage=$8/hr	
11. H-2B immigrant visa with excellent references, wage=$11/hr	

Table 3. Two-Limit Tobit for Seafood processing analysis (Total, n=216)

Attribute		Coefficient	Standard Error
Immigration status	H-2B immigrant	-0.545	0.871
	Non H-2B immigrant	-5.206***	1.007
References	Mediocre	-3.856***	0.893
	Poor	-5.712***	0.989
Required wages	Medium wage($11)	3.201***	0.956
	Low wage($8)	8.024***	1.024
Constant		3.198***	0.977
σ		4.813	0.377

1) *** shows significance at the 1% level.
2) Log L. Ratio χ^2 is -388.5, Pseudo R^2 is 0.13

Table 4. Preferred Traits

Trait	Parameter Range	%
status	5.206	27.5
reference	5.712	30.2
wage	8.024	42.4
Total	18.942	100.0

Table 5. Ranking Potential Employees

Rank	Condition			Rating
1	Domestic	Excellent	Low wage($8)	8.024
2	H-2B	Excellent	Low wage($8)	7.479
3	Domestic	Mediocre	Low wage($8)	4.168
4	H-2B	Mediocre	Low wage($8)	3.623
5	Domestic	Excellent	Medium wage($11)	3.201
6	nonH-2B	Excellent	Low wage($8)	2.818
7	H-2B	Excellent	Medium wage($11)	2.656
8	Domestic	Poor	Low wage($8)	2.312
9	H-2B	Poor	Low wage($8)	1.767
10	Domestic	Excellent	High wage($15)	0
12	H-2B	Excellent	High wage($15)	-0.545
11	Domestic	Mediocre	Medium wage($11)	-0.655
13	nonH-2B	Mediocre	Low wage($8)	-1.038
14	H-2B	Mediocre	Medium wage($11)	-1.2
15	Non H-2B	Excellent	Medium wage($11)	-2.005
16	Domestic	Poor	Medium wage($11)	-2.511
17	nonH-2B	Poor	Low wage($8)	-2.894
18	H-2B	Poor	Medium wage($11)	-3.056
21	nonH-2B	Excellent	High wage($15)	-5.206
19	Domestic	Poor	High wage($15)	-5.712
23	Domestic	Poor	High wage($15)	-5.712
22	nonH-2B	Mediocre	Medium wage($11)	-5.861
20	H-2B	Poor	High wage($15)	-6.257
24	H-2B	Poor	High wage($15)	-6.257
25	nonH-2B	Poor	Medium wage($11)	-7.717
26	nonH-2B	Mediocre	High wage($15)	-9.062
27	nonH-2B	Poor	High wage($15)	-10.918

Table 6. Two-Limit Tobit for Seafood Processing Analysis by Two Groups

Attribute		Group 1 (n=9)		Group 2 (n=15)	
		Coefficient	Standard Error	Coefficient	Standard Error
Immigration status	H-2B immigrant	-0.789	1.121	-0.233	1.022
	Non H-2B immigrant	-3.636***	1.320	-5.432***	1.171
References	Mediocre	-2.141*	1.155	-4.664***	1.046
	Poor	-2.696**	1.280	-7.076***	1.166
Required wages	Medium wage($11)	4.940***	1.301	1.891*	1.102
	Low wage($8)	12.396***	1.508	4.519***	1.143
Constant		-0.067	1.345	5.228***	1.119
σ		3.657	0.480	4.492	0.434

1) ***, **, * shows significance at the 1%, 5%, 10% level.
2) Log L. Ratio χ^2 is -126.73, Pseudo R^2 is 0.24 for group 1, Log L. Ratio χ^2 is -242.15, Pseudo R^2 is 0.13 for group 2.

Table 7. Preferred Traits

Trait	Group 1		Group 2	
	Parameter	%	Parameter	%
status	3.64	19.41	5.43	31.90
reference	2.70	14.40	7.08	41.56
wage	12.40	66.19	4.52	26.54
Total	18.73	100	17.03	100

Table 8. T-test between two groups

Variables	Group1		Group2		Differences b/w groups		t-values
	Mean	Std. Err.	Mean	Std. Err.	Mean	Std. Err.	
Total hired employment	14.667	5.212	40.667	14.231	-26.000	18.960	-1.371
% of labor cost	0.222	0.147	0.267	0.118	-0.044	0.190	-0.233
Total expenses in 2011	0.222	0.147	0.400	0.163	-0.178	0.240	-0.739
Gross income in 2011	0.111	0.111	0.533	0.165	-0.422	0.231	-1.825
Can speak Spanish	0.222	0.147	0.133	0.091	0.089	0.163	0.545
Have a member who can speak Spanish	0.444	0.176	0.533	0.133	-0.089	0.219	-0.405