

You Can('t) Always Get the Job You Want: Stated versus Revealed Employment Preferences in the Peruvian Agro-industry

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ABSTRACT

Employment in high-value agro-export sectors has been recognized to entail the potential to contribute to poverty reduction in rural areas of developing countries. Concerns have yet been raised about the quality of the created employment and worker preferences have often been overlooked in the literature. We use a discrete choice experiment, in which we relate stated and revealed employment preference of agro-industrial export workers in Peru. We explain employment (mis)matches as a function of personal and employer characteristics. Results suggest that employment preferences are heterogeneous, but that labor market frictions are smaller than what is commonly expected in developing country contexts.

Key Words: employment conditions, stated and revealed preferences, discrete choice experiment, horticultural exports, Peru

JEL Code: J24, J43, J81, O54, Q17

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1. INTRODUCTION

Employment in high-value agro-export sectors has been recognized to entail the potential to contribute to poverty reduction in rural areas of developing countries (Maertens, Colen and Swinnen, 2011; Mano et al., 2011; Van den Broeck, Van Hoyweghen and Maertens, 2016). A large number of jobs has been created in these sectors – e.g. an estimated 35,000 workers are employed in the fruit sector in Ghana; 85,000 in the Ethiopian flower industry; and 100,000 in the Peruvian horticultural sector (Jaffee, 2003; Schuster and Maertens, 2016; Staelens, Louche and Haese, 2014) – but the quality of this employment has been questioned. Workers in high-value export sectors are mainly low-skilled and vulnerable labourers, often migrant workers and women, who work on temporary and part-time contracts (Barrientos, McGlenaghan and Orton, 2000; Maertens and Swinnen, 2012). These less empowered workers have a higher likelihood of being exposed to inferior employment conditions and to exploitation (Van den Broeck, Van Hoyweghen and Maertens, 2016). There is a growing body of literature investigating the employment conditions of workers in high-value export sectors in developing countries (Barrientos, 1997; Barrientos McGlenaghan and Orton, 2000; Dolan and Sutherland, 2002; Kritzinger, Barrientos and Rossouw, 2004) with some studies focussing specifically on the effect of the adoption of private standards (Schuster and Maertens, 2016; Barrientos, Dolan and Tallontire, 2003; Colen, Maertens and Swinnen, 2012; Ehlert, Mithöfer and Waibel, 2014; Nelson, Martin and Ewert, 2007; Riisgaard, 2009). This literature rarely takes into account workers' social preferences and heterogeneity in workers' preferences to understand the quality of employment in high-value export sectors.

This article analyses workers' preferences and adds to the literature on employment conditions from a different perspective. We analyse the job preferences of young potential workers in the Peruvian horticultural export industry before they actually enter employment using a discrete choice experiment. We compare workers' stated preferences (SP) from the choice experiment with revealed preferences (RP) from their actual employment six months later, after the export season. Our approach allows us to analyse employment conditions from a worker perspective and to explicitly take into account heterogeneity in workers' social preferences. Most studies on high-value export sectors benchmark observed employment conditions against national labour laws, international labour standards such as the ILO Decent Work Agenda or researchers' own perceptions about decent work. A notable exception¹ is the study by Van den Broeck, Van Hoyweghen and Maertens (2016) on women's preferences for employment contracts in the Senegalese horticultural export sector. Our paper makes a relevant contribution as we assess to what extent workers are capable to find the employment conditions that *they* prefer within high-value export sectors. Such an approach may add new perspectives to the discussion on the quality of employment in these high-value export sectors. In addition, our approach is in line with the labour economics literature documenting heterogeneity with respect to workers' social preferences in terms of ability, motivation, loyalty, labour time, remuneration, etc. (e.g. Egger and Kreickemeier, 2010; Enlgrmaier, Strasser and Winter, 2014; Kawata, 2015; von Siemens, 2011).

By comparing stated and revealed employment preferences we are able to reveal insights about the existence of a socially efficient allocation of labour within the sector. Workers

[1] We need to note that stated preferences methods such as discrete choice experiment are parsimoniously applied in the broader labour economics literature, for example to analyze the preferences of health workers (e.g. Mandeville, Lagarde and Hanson, 2014) and heterogeneity in motivation among workers in for-profit and non-profit sectors (e.g. Lanfranchi, Narcy and Larguem, 2010).

are heterogeneous in terms of ability and motivation and companies cannot perfectly screen for differences in worker preferences that ultimately determine worker satisfaction and productivity. This problem of asymmetric information between potential employees and employers may result in labor market imperfections that impede a socially optimal labor allocation and create mismatches between what workers want and what they get (Euwals, 2001; Johnson, 2011; Kawata, 2015). Such mismatches in the labor market have been documented and analyzed by several authors (for example, Kawata, 2015; Reynolds, 2003; Reynolds and Aletraris, 2006; Wooden, Warren and Drago, 2009) for a single employment attribute, working hours. Analyzing the mismatches between stated employment preferences from a discrete choice experiment and revealed preferences from actually observed employment, as we do in this article, allows to take into account several employment attributes and the trade-off between them.

Only a handful of papers have jointly analysed stated and revealed preferences and our paper makes an original contribution to this stream of literature. Agricultural economics studies that combine stated and revealed preferences data have analysed buyer preferences for genetic information in livestock transactions (Vestal et al., 2013); consumer preferences for organic milk and milk from cloned cows (Brooks and Lusk, 2010); customer choices for certified dry-cured ham in Spain (Resano-Ezcaray, Sanjuan-Lopez and Albisu-Aguado, 2010). None of these studies have analysed employment preferences of agro-industry workers. These studies largely point out that stated and revealed preferences are highly correlated although significant differences may exist.

2. BACKGROUND

Today, Peru is a worldwide leader in horticultural exports. Peruvian exports expanded significantly since the mid-1990s and have been growing at an average annual rate of 8.56% since the year 2000 (FAOSTAT). The sector initially evolved around asparagus but the importance of other export crops such as grapes, avocado and artichoke is steadily growing. The horticultural production area ranges from 300 km south (Ica region) to 600 km north (La Libertad region) of Lima along the Pacific coast. In 2011, nearly 450,000 ton of these four crops was exported for a total value of 872,364 USD (Schuster and Maertens, 2016). In 2014, the agro-industrial sector included about 400 export companies. These can be completely vertically integrated with production, post-harvest handling and exporting controlled by the company or can rely on external producers and/ or product processors (see Schuster and Maertens, 2013 for more details). All horticultural products are exported in a processed and ready-to-consume form, implying that the added-value from product sorting, handling and packaging stays within the national borders. These investments have created approximately 140,000 direct employments (Schuster and Maertens, 2016). The workers either come from historical villages located in the valleys along the coast, or from new settlements surrounding the plantations. Livelihoods mostly depend on the agro-industry. Recent concerns relate to the quality of the employment that was created. Employment conditions can vary by employer, in terms of wages, social services, working hours, job duration, as well as trainings and treatment the worker receives.

3. DATA AND METHODS

Data on potential and actual agro-industrial workers were collected in two phases. First, we collected baseline survey data between July and September 2013 in two agro-industrial export regions, Ica and La Libertad. Our target population were young men and women

(between 17 and 21) with no previous employment experience in the sector but with the objective to start horticultural employment in the subsequent export season. A random sample of 592 young- unexperienced workers, clustered in 78 villages and 9 districts, was drawn. Second, follow-up data were collected between February and April 2014, at the end of the main export season. Out of the 592 respondents from the baseline survey, 528 young potential workers could be re-surveyed of which 414 started employment in the horticultural export sector. For the scope of this article, we use the balanced panel dataset on 414 respondents in 9 districts; it contains information on the workers' socio-demographic background, education, overall wellbeing, and their employment history between August 2013 and March 2014. Workers were employed in 115 different companies in the period under examination. In addition to the quantitative structured questionnaire a choice experiment on employment preferences was implemented during the baseline survey in August 2013. In parallel to the workers' survey, data were collected from the 115 employing companies. The company survey covers all potential agro-industrial employers of the workers in the districts under analysis. The company dataset contains information on production and processing procedures, management structure and ownership.

3.1. Worker characteristics

Table 1 shows the descriptive statistics for the full sample of workers at baseline (i.e. in 2013), and by region. Statistically significant regional differences are reported. In line with the selection criteria, the average age in our sample of workers is 19.59. Exactly 50 per cent of workers are female and the average worker has at least completed secondary school, which corresponds to 10 years of continuous formal education. In La Libertad slightly more men were surveyed and, on average, respondents are somewhat less educated. Over two thirds of surveyed workers are not yet married, nor cohabiting. Almost half of the sample is not born in the region of residence, i.e. have migrated to the Peruvian coast. The average household size is 4.29 and in 25% of all cases the household head is female. Households are smaller in La Libertad, as compared to Ica and are more likely to cultivate a piece of land. Households own, on average, 4.67 household assets. In barely one fourth of all cases, the mother and/ or father of the respondent is employed in the agro-industrial sector. This figure is slightly higher in Ica than in La Libertad. Finally, respondents were asked about their employment aspirations: around three quarter of all respondents declare that at the age of 40 they want to be employed outside of the agro-industrial sector, i.e. run a business or have a different wage-employment, which is commonly valued as a better employment option than the agro-industry. This seems to suggest that many workers see agro-industrial employment as a temporary activity and a stepping stone towards other forms of employment.

3.2. Stated employment preferences

We use a choice experiment to assess workers ex-ante preferences for a specific type of employment. Surveyed workers were asked to evaluate different employment scenarios, and to choose the employment scenario they would prefer to be employed in. Attributes and associated attribute levels for the choice options were based on qualitative interviews and focus group discussion with workers previous to the survey (carried out by the first author in April 2013), as well as on a thorough literature review on employment conditions in high-value agro-export sectors. The final choice options were defined by 5 attributes: 1) contract type 2) weekly wage 3) treatment, 4) training, and 5) duration of the employment – and two or three levels for each attribute (table 2).

The first attribute, contract, describes whether the worker signs a formal employ-

ment contract with the company. Although the signature of a contract does not protect workers from short time employment, it provides the workers with additional benefits in terms of annual leave, social security and rights to overtime payments. The second attribute, weekly wage, is a monetary attribute and is expressed in the local currency, *Peruvian Nuevo Soles* (Soles). We chose three different wage levels, based on the 2014 Peruvian national minimum wage of 750 soles/month and the qualitative interviews. The third and fourth attribute describe the treatment and training the worker receives from the company. During focus group discussions, workers often reported about hostile work environments and denigration by their supervisors. At the same time considerable variation was reported on the amount and type of training workers receive; trainings are either only technical task-specific or also include information on health and safety practices. Both attributes take on three levels: respectively, bad, medium and good treatment, and no, basic and a lot of training. The last attribute, duration of employment describes the months the person is working in the company; it uses three levels: 1) two months employment; 2) four months employment (entire export season), and 3) ten months employment. A special law in Peru provides non-traditional export companies with a high flexibility in temporary hiring (Schuster and Maertens, 2016). This entails that a large share of the workers in the horticultural export sector are hired on a temporary basis. Longer employment durations and a derogation of the special laws are advocated by NGOs and worker unions to increase job security.

We use choice sets with three alternatives, each representing an alternative employment scenario differentiated by the five different attributes and levels. Given that all respondents have the intention to start agro-industry employment in the coming export season, we do not include an opt-out option for not working. The full factorial design of unique employment scenarios that can be created from all attributes and attribute levels includes 162 possible combinations (2×3^4) of jobs that could be created for each choice option. This implies $(162 \times 161/2) = 13,041$ possible choice sets. Because this is obviously too large to be evaluated by the respondents, we used Ngene software to reduce the choice set to a manageable level, through a D-efficient design. The efficient design is based on the minimization of the correlation between attribute levels of alternatives, as well as the minimization of standard errors of parameter estimates (Bliemer and Rose, 2009). From the full factorial, 12 choice cards were created in two blocks of 6 cards (D-error=0.05104). Every respondent was asked to choose between 6 different hypothetical employment scenarios. We made sure that no dominant choices were included in the choice sets (see figure A1 in the appendix for an example of the choice card). Choice cards were shown in a random order to account for possible order-effect biases (Ladenburg and Olsen, 2008; Day et al., 2012). We carefully implemented the choice experiment by first explaining the objective of the study, as well as the different attributes and attribute levels to the respondent. We included a ‘cheap talk’ script to reduce the likelihood of the response to be influenced by the interviewer or hypothetical nature of the choice experiment (Norwood and Lusk, 2011; Silva et al., 2011).

3.3. Revealed employment preferences

The follow-up survey collects information about workers’ actual employment choice. If workers were employed in more than one company in the period under observation, the company with the longest employment period was kept. The survey includes questions about employment conditions, corresponding to the attributes included in the choice cards. Table 3 provides information about the actual employment conditions in the two regions under analysis. La Libertad region is characterized by less, but larger companies; Ica has more but smaller

companies, in term of cultivated land, export volumes and workers². Values in the table correspond to the average employment conditions in a specific company and are estimated from the worker survey. Averages of worker responses within each company were rounded down or up to the closest attribute levels used in the choice experiment. Two survey questions inquire about the worker's contract signature with the company, and the payment s/he receives per week. In another question, respondents were asked to evaluate how their employer treated them on a scale from 1-5. If the average worker replied a value between 1 and 2.49 the company was classified with the level 'bad treatment'; if the average scale was a number between 2.5 and 3.49 it was classified with the level 'normal treatment'; anything above 3.5 was classified as 'good treatment'. Data were collected on the number and types of trainings the worker received during its employment. The attribute level 'basic' instead of 'no' is applicable when the average worker in a company received at least one type of technical training; the level 'a lot' is applicable if the average worker received more than one type of training, e.g., an additional health and safety training. Finally, for the attribute on employment duration, the questionnaire inquired about the actual employment time in a company between the baseline and follow-up survey.

From table 3 we see that on average 44% of all companies offer a written contract. While this is more than half of all companies in Ica, barely 1/3 of all companies in La Libertad offer a work contract. Weekly wages are also on average 24 Soles higher in Ica than in La Libertad, which is likely due to the larger competition in the Southern region. On average, companies offer a 'normal' treatment; around 1/3 of all companies are reported to offer 'bad' treatment and 1/5 'good' treatment; no regional difference is detected. While companies in the North are less likely to offer any training, they are more often hiring workers for longer time periods, which is related to the larger size and export volumes of companies in this region (workers rotate between different export crops and task).

3.4. Empirical method

We identify the mismatch between workers' actual and ideal employment and assess the determinants of the mismatch in terms of employer and worker characteristics. We follow a similar approach as Reynolds (2003). In a multivariate regression framework, he identifies the determinants for the gap between workers' actual and ideal working hours. We use a discrete choice experiment and individual Willingness to Pay (WTP) values to detect employment preferences. The choice experiment set-up allows us to take into account more than one employment attribute. Individual, instead of average, WTPs account for personal characteristics in shaping work preferences.

We use a multinomial mixed logit models to analyze our choice data³. Logit models have been widely used in the experimental choice modelling literature to determine respondents' 'tastes' towards certain products, services or attributes of products (Brownstone, Bunch and Train, 2000; Hensher, Rose and Greene, 2008; Lave and Train, 1979; McFadden and Train, 2000; Train, 1980, 1986, 1998). Compared to the traditional conditional or multinomial logit, the mixed logit model allows for heterogeneity in taste amongst respondents. Further, the mixed logit approach obviates limitations of the standard logit model by allowing for unrestricted sub-

[2] This is mainly due to land and water limitations in Ica. A large irrigation project 'Chavimochic' in the North of the country facilitates the exploitation of large areas of desert land, reaching up to 4,000 ha for the largest companies.

[3] The analysis is based on the random utility framework, typical of experimental choice modelling (see Louviere et al., 2000).

stitution patterns and correlation in unobserved factors over time (Train, 2009)⁴.

The utility U associated with each employment alternative j , as evaluated by each worker i in choice situation t (where $T=6$), is represented as follows:

$$U_{ijt} = V_{ijt} + \varepsilon_{ijt} = \beta X_{ijt} + \sigma_i X_{ijt} + \varepsilon_{ijt}$$

where X_{ijt} is a vector of explanatory variables relating to alternative j (i.e. attributes of the choice alternative, such as contract, wage, duration, training and treatment, and the levels these take). β is a vector of preference parameters associated with the attributes and σ_i is a vector of individual-specific standard deviation parameters. ε_{ijt} is a stochastic error term, independent and identically distributed over individuals, alternatives and time. Within each choice set, each worker chooses one out of the three proposed options that maximizes his/her utility. The chosen mixed logit model accommodates the estimation of ‘individual-worker specific preferences’, by deriving the conditional distribution based on known choices (within-sample) as shown by Revelt and Train (2000). To estimate the β -coefficients the mixed logit module by Hole (2007) is used. We derive individual WTP estimates for each attribute by calculating, for each worker, the conditional mean of the attribute parameter for that worker, the conditional mean of the wage parameter and then calculating the WTP as the ratio of an attribute parameter to the monetary parameter (Hensher, Greene and Rose, 2006). In that way, we calculate the income or wage that a worker is willing to forego in order to get specific non-monetary employment conditions. For comparative purposes we estimate a mixlogit model on the revealed preference data, similar to the mixlogit model on the stated preference data, but where the chosen option is the revealed employment from the feasibility set of all employment options within the workers’ district of residence. The ‘district feasibility set’ is constructed from the information on all employing companies and employment characteristics in these companies (corresponding to the attribute levels), as well as the information on the actual employment each worker chooses and the employment attribute levels of its employer. A company is within a workers’ feasibility set (i.e. is within the ‘workers’ reach’) when at least one worker from the same district of residence is employed in that company. At the level of the nine districts within the two regions, the district feasibility sets include between 11 and 35 companies (i.e. workers have between 11 and 35 employment options)⁵.

We exploit the data on the actual employment each worker chooses and the employment attribute levels of its employer, to estimate the individual preferences and thus WTP for each worker’s revealed employment (WTP RE) based on the individual specific coefficient estimates obtained from the choice experiment, i.e. stated preference data. With this data we estimate the workers’ individual WTP for each employment option (WTP EO) within its feasibility set.

[4] We focus on the mixed logit approach in the estimation, because we believe that it is reasonable to assume that respondents differ in their level of appreciation for some attributes included in the choice experiment. For example, some workers may pay a lot of attention to a ‘good treatment’ or ‘a lot of training’, while others may not be very concerned about these attributes. In the model, the random distribution of the preference parameters for ‘treatment’ is described by a normal distribution with a certain mean and variance. The mixed logit model estimates mean and variance statistics that completely describe this distribution.

[5] We alternatively estimated a ‘regional feasibility set’, i.e., based on the geographical location of both workers and companies, in either Ica or Trujillo. A higher mobility is assumed in the regional employment feasibility set. Results do not change in both specifications and our further analysis only relies on the ‘district feasibility set’, which is closer to workers’ realistic employment options. Results from the analysis with the ‘regional employment feasibility set’ are available upon request.

By comparing the workers' WTP RE with the maximum willingness to pay for the employment options within their reach ($\max(\text{WTP EO})$), we determine the extent to which workers' actual employment matches their ideally preferred employment. This strategy reflects the subjective component of employment quality, according to which to understand a person's actual employment condition, one must get insights into the persons' preferred employment (Clarkberg and Moen, 2001). In the sector under analysis, workers are free to choose their employer, especially in the high season. The gap between the actual and preferred employment thus provides us with an indication of labor market imperfections due to information asymmetries in the sector. In line with Reynolds (2003) who shows that socio-economic and job characteristics affect actual and preferred working hours, we analyze the mismatch between workers' actual and ideal employment as a function of personal and employer characteristics. We estimate regressions of the following type:

$$\text{Match}_i = \alpha + \beta_1 X_i + \beta_2 C_j + D_i + \varepsilon_{ij}$$

where Match_i is either 1/ a dummy variable equal to one if WTP RE corresponds perfectly to $\max(\text{WTP EO})$, or alternatively 2/ the absolute difference between WTP RE and $\max(\text{WTP EO})$. The vector X_i is a set of observable worker characteristics (described in table 1). C_j is a vector of characteristics of the revealed employment company j ; it includes information on the number of worker, the number of months per year the company is active, the processing plant ownership and its formal registration. District dummies D_i are included to control for location effects. ε_{ij} is the random error term. We estimate logit and tobit models according to the binary or left-censored nature of the dependent variable.

4. RESULTS

4.1. Stated and Revealed Preference Coefficients

Firstly, the coefficients of the attributes are estimated (table 4). The model estimations are based on 7,452 observations (414 respondents; 18 choice options per respondent). 'Wage' is the only variable which is fixed; all other variables are treated as random (Rabe-Hesketh and Skrondal, 2012; Train, 1986). The mean and standard deviation of each coefficients are separately estimated for the full sample, as well as the two regions and nine district. Results are consistent with expectations: people value a wage increase and a written contract, prefer a good and a normal to a bad treatment (where the former is more valued than the latter) and get a higher utility from training, as compared to no training. Only the duration of employment seems on average to play no role when choosing the employment options with the highest utility. The standard deviations are highly significant, pointing to a high variability in workers' preference for the attribute parameters. Results are similar when splitting the analysis at the regional and district level. For comparative purpose and as a robustness check of our SP parameter estimates, we ran a similar mixlogit model on the revealed preference data. We further plotted the relationship between the RP and SP parameters. Estimates from the RP model are somewhat less significant than those from the SP model, but go in the same direction. There is clearly a positive relationship between the SP and RP preferences from the graphical representation (detailed results are shown in table A2 and figure A2 of the appendix). The results confirm the appropriateness of our chosen attributes and SP parameters. The somewhat less significant coefficients in the RP versus the SP preference model is likely due to collinearity and lower visibility of some attributes in the real world (i.e, treatment).

4.2. Stated and Revealed WTP estimates

Individual WTP values for the revealed employment and each individual's maximum WTP for all employment options are calculated from the individual specific parameter estimates from the mixed logit regression on the full sample (table 4). Figure 1 plots the relationship between these estimates, as well as the distribution of the difference between the revealed WTP and maximum WTP. The clear positive relationship between the WTP RE and WTP EO values suggest a relatively good match between the workers willingness to pay, i.e. willingness to forego some income, for their actual job conditions and the ideal job conditions within their feasibility set. In fact, the correlation coefficient is 0.81 and the absolute difference between the WTP RE and max WTP EO is less than 100 Soles in 95% of all cases, less than 50 Soles in 75% and less than 28 Soles in 50%; the mean difference is 33 Soles, which corresponds to 15% of the average weekly wage. A perfect match is achieved in 66 out of 414 cases. The right-skewed distribution indicates that only for a very small share of the respondents the actual employment conditions differ a lot from what they would prefer and what is feasible or within their reach.

Table 5 shows results from logit models on the likelihood of a perfect match between the WTP RE and maximum WTP EO, and results from tobit models on the difference between the two WTP estimates. First, from the logit results, we see that both worker and company characteristics affect the likelihood of achieving a good match between the workers' actual and ideal employment. Age and a larger number of household assets increase the workers' probability of being employed in the company of their first choice. For female workers and workers of female headed households this probability decreases. This indicates that older workers (although effects are non-linear), male workers and workers from richer or male headed households have the possibility to more carefully choose their employment. While education is not significant, workers' aspirations enter the model with a positive and significant coefficient: workers that aspire to a non agro-industrial employment more carefully select their employer, indicating that they judiciously plan their career. The last four variables included in the models detect the effect of company characteristics on the employment match. The formality of a company and the number of months it is actively producing increase the likelihood of a good match: more stable companies with longer export seasons are better able to inform workers about labor conditions, which in turn can select the company according to their individual preferences. The effect on the number of workers within a company has a u-shaped effect on matching, with a turning point at 70 workers. Given workers' first employment choice, they are more likely to get a job in that company if the company hires a larger number of workers; but a too large number of workers increases the likelihood to find a job in that company due to job availability and not due to individual preferences. Second, in the tobit model we explore whether worker and company characteristics influence the proximity in WTP values for the actual and ideal employment, also in the absence of a perfect match. Regression results partly confirm, but also expand on the results from the logit model. In line with the previous outcomes, the number of assets decreases the absolute distance between the WTP RE and max(WTP EO), while being a worker of a female headed household increases it. Interestingly, mothers' and fathers' employment in the agro-industry enter the regression with opposite significant signs and, respectively, decrease and increase the likelihood of a job match. Children, and especially daughters, often do not choose their employer but follow their mother's employment, which does not necessarily correspond to their ideal choice⁶. In turn, fathers' employment functions as an information vehi-

[6] When conditioning on only female workers, the mothers' agro-industrial employment even predicts failure perfectly.

cle about the agro-industrial sector and its employment options and thus reduced the distance between a workers' WTP for an actual and ideal job. The migration variable shows a negative and significant coefficient; since migration is mainly due to employment opportunities in the agro-industrial sector it reasonably indicates that workers that decide to move, more carefully evaluate and choose among their employment options. Both the education and job aspiration variable are not significant. Results on company characteristics in the tobit model specification remain significant for the number of company workers and the months the company is producing. District dummies are not reported but highly significant, indicating that there exist large variation in terms of employment matches across locations.

5. DISCUSSION

There are different reasons for a (mis)match between stated and revealed employment preferences. First, preferences can change over time. This has been highlighted already in 1978 by the seminal study from Jurgensen, and confirmed by more recent evidence (e.g., Grund, 2013). Our period of observation between the stated and revealed preferences is short: workers were surveyed on their stated employment preferences in August and September 2013 and took up employment in the high season, in September or October that same year. The average time period between the time of the interview and the employment uptake was 28 days, implying that bias from changes in preferences is limited. Second, empirical evidence has suggested that contingent valuation methods can overstate real economic value and that the accuracy of the respondents preferences depends on the realistic experimental design or the (non)-hypothetical nature of the questions (e.g., Carson, Flores and Meade, 2001; Harrison and Rutstrom, 2002). Stated preferences could thus be affected by a so called 'hypothetical bias'. Given our restricted sample of only future workers, participants in our case study are highly concerned and familiar with the employment being valued. Also, respondents live in an area where most of the labor force is employed in the agro-industry. This suggests that there exists a high understanding of the sector. Results indicate that a perfect match between workers' stated and revealed preferences is achieved in 66 out of 414 cases. At the same time the correlation coefficient between the two willingness to pay values for each worker's ideal and current employment, i.e. the wage a worker would be willing to forego to respectively get his/her ideal or current employment option, is 0.81. This shows that the hypothetical choices of future workers are close to their true future employment choices. In addition, largest differences between stated and revealed employment preferences are seen in less visible attributes, such as treatment, which - in contrast to for example wage or contract characteristics - are less discernable previous to recruitment (see table A2). There is thus evidence for a common underlying choice pattern in the SP and RP data, suggesting that workers in our sample often have the job they want. The results are in line with evidence from other sectors and contexts that find that, despite not fully overlapping, stated and revealed preference are clearly related (e.g., Brooks and Lusk, 2010; Resano-Ezcaray, Sanjuan-Lopez and Albisu-Aguado, 2010; Vestal et al., 2013). We interpret the quite good match between stated and revealed preferences as pointing to imperfections in the labor market in the sector being small.

The results from the choice experiment suggest that it is important to assess employment conditions from the worker perspective. Researchers interested in job attribute preferences have analyzed job choices by means of two main methodologies in which workers are asked to rank attributes ('direct estimate method'; see Bartol & Manhardt, 1979; Manhardt, 1972; Wiersma, 1990) or to provide suitability judgments based on attribute description ('policy-

capturing method’; see Einhorn, 1971; Zedeck, 1977). Both methods have been criticized for excessive subjectivity, participants fatigue, and inconsistency of results across studies (Slaughter, Richard and Martin, 2006); they are also unable to account for attributes’ trade-offs. A choice-experiment on employment choices represents an alternative way of analyzing preferences and trade-offs among alternatives. We find that both wage, but also non-wage attributes are valued by the workers and written contracts, training and good treatment are shown to increase workers’ utility. This is in line with results from Van den Broeck, Van Hoyweghen and Maertens (2016), who from a choice experiment in the Senegalese horticultural export sector, find that workers value health care, training and transport service, in addition to wage benefits. Our findings are also similar with respect to the little importance given to job security; the effects we find are likely explained by the young cohort of respondents, with still little work experience.

Results on the comparison of best hypothetical and actual job choices indicate that employment (mis)matches depend on workers’ personal, as well as employer characteristics. We confirm results from the literature on employees’ social preferences and find that workers’ are highly heterogeneous⁷. The spread of workers’ individual willingness to pay values for different employment options shows that workers have different preferences for the same employment attributes. While an employment with certain characteristics can represent an ideal job for one worker, it can be considered as a bad option by another worker. Accordingly, also differences in willingness to pay values for an ideal and actual employment are highly diverging across workers. Yet, some groups of workers are more likely to meet their ideal employment expectations, while others are systematically farther away from their ideal choice. In particular, members of more vulnerable households (lower number of assets and with female headed household) are less likely to be close to their preferred job, while older and male workers tend to get a better match. Workers’ job choice is highly influenced by their peers, likely through information. Company characteristics play a role as well: larger and formal companies are better able to match the workers’ expectations. Interestingly the ideal company size lies around 70 workers, indicating that too small and too large employers are not able to satisfy their workers’ preferences. Results can be related to the literature on working hours’ choice, which consistently finds that preferences vary with socio-economic worker characteristics and job characteristics (Reynolds, 2003; Reynolds and Aletraris, 2006; Van Echtelt, Glebbeek and Lindenberg, 2006).

6. CONCLUSION

Agricultural off-farm employment in low- and middle income countries has been said to be an important contributor to poverty alleviation, especially in rural areas. It has also been argued that the welfare of employees depends on the quality of the employment that is created (Barrientos et al., 2011; Selwyn, 2013) and on the work (mis)match between workers’ preferences and actual employment (Wooden, Warren and Drago, 2009). Although textbook models of labor supply do not distinguish between the employment conditions *per se* and the match between a worker’s ideal and actual employment, an increasing stream of survey evidence suggest that employment mismatches are common (e.g., Jacobs and Gerson 2004; Lee 2004; Reynolds, 2003; Reynolds and Aletraris 2006; Stier and Lewin-Epstein 2003).

In this article we examine the employment (mis)matches of agro-industry workers in Peru and the personal and employer characteristics that tend to produce them. We use a discrete choice experiment, in which we relate stated and revealed employment preference

[7] See Konrad et al. 2000 for an overview on gender-related preferences; Bretz and Judge (1994) and Trank, Rynes and Bretz (2002) on the relation between personality or ability and preferences, and Powell, 1984 on the effect of job attributes on organizational attractiveness

and explain employment (mis)matches in a multivariate regression framework. Results suggest that employment preferences are heterogeneous in the agricultural export sector in Peru, but that labor market frictions are smaller than what is commonly expected in a developing country context. Although only 16% of all workers are hired by their employer of first choice, the correlation between workers' individual willingness to pay for their actual and preferred employment is very high. Relatively low labor market imperfections are likely related to the large information exchange within the villages of residence, and the seasonal nature of the employment. The latter is in line with the literature on the importance of job transitions to improve labor market mismatches (see for example Euwals, 2001; Martinez-Granado, 2005; and Blundell, Brewer and Francesconi, 2008). Some differences remain and are related to socio-economic and job characteristics.

In the research area under analysis, the horticultural export sector is the main employment provider. The results from the choice experiment and the comparison between stated ideal and revealed employment add a new perspective to the discussion on the quality of agricultural off-farm work. To fully evaluate employment quality and draw conclusions on the resulting job satisfaction, it is important to get insights into workers' social preferences and preference heterogeneity among workers. Monetary income certainly remains a fundamental component in job quality, but also other job characteristics are shown to play a role. This study clearly shows that employment preferences differ significantly and that there is no type of employment that is considered superior by all workers. As such non-monetary job characteristics as well as possibilities to offer worker-specific contracts should be taken into account when designing labor contracts, as well as labor codes of conduct. By adapting employment options to workers' preferences and creating the external conditions that facilitate the match between workers ideal and actual employment, the sector can be an important driver of rural development. Special attention should be paid to more vulnerable groups of workers who are less likely to be able to meet their preferences.

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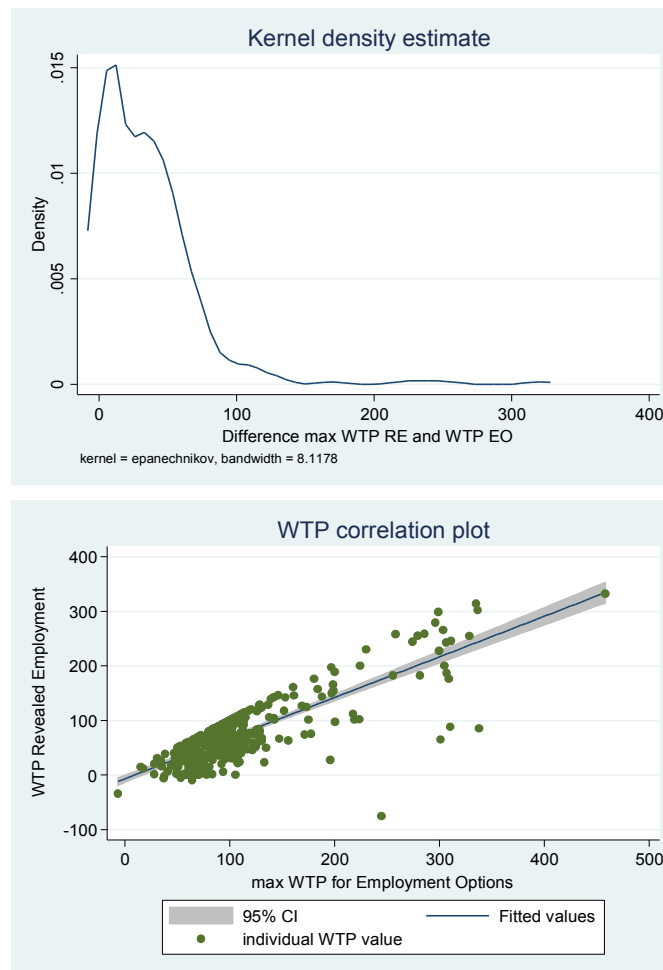
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FIGURES

Figure 1: Relationship between WTP for revealed employment (WTP RE) and maximum WTP for possible employment option (WTP EO)



TABLES

Table 1: Worker Characteristics, by Region

	Full sample	by region	
		Ica	La Libertad
Number of workers	414	205	209
Age	19.59 (1.78)	19.56 (1.95)	19.62 (1.59)
Female (=1 if female)	50%	57%	43% ***
Education (0 - 16 years)	10.00 (2.47)	10.26 (2.19)	9.74 (2.69) **
Single (versus cohabiting or married)	78%	74%	79%
Migration (=1 if not born in region)	47%	46%	48%
Female household head	25%	25%	25%
Number of household members	4.29 (2.54)	4.66 (2.73)	3.92 (2.27) ***
Land (=1 if household cultivates land)	21%	18%	25% *
Number of household assets ^(a)	4.67 (2.10)	4.78 (2.12)	4.57 (2.08)
Mother in agroindustry	22%	26%	19% *
Father in agroindustry	23%	28%	19% **
Non-agroind employm at age 40	76%	80%	72% *

Note: Mean worker characteristics from the baseline survey are reported; Standard deviations in parenthesis for continuous variables; *p < 0.10, **p < 0.05, ***p < 0.01 for comparison of Ica and La Libertad (t-test for continuous variables; chi2 test for categorical variables); (a) Count variable for household assets: fixed telephone, mobile phone, TV, microwave, sofa, fridge, radio, computer, radio, motorbike, car, bicycle

Table 2: Overview of Attributes and Levels

Attribute	Attribute levels
Contract	Written contract; No written contract
Wage	190 Soles/ week; 210 Soles/ week; 220 Soles/ week
Treatment	Poor; Fair; Good
Training	No training; Some training; A lot of training
Employment duration	2 months; 4 months; 10 months

Table 3: Revealed Employment Conditions in Companies; Sample Averages from Worker Survey

	Full Sample	by region		
		Ica	La Libertad	
Nb of companies	115	72	43	
Written contract	44.35%	52.78%	30.23%	**
Weekly wage (Soles)	222.39 (66.42)	231.46 (67.43)	207.20 (62.54)	*
190 Soles	34.78%	26.39%	48.84%	**
210 Soles	20.87%	26.39%	11.63%	*
220 Soles	44.35%	47.22%	39.53%	
Treatment				
Bad	37.39%	38.89%	34.88%	
Normal	43.48%	43.06%	44.19%	
Good	19.13%	18.06%	20.93%	
Training				
No	52.17%	45.83%	62.79%	*
Basic	26.96%	31.94%	18.60%	
A lot	20.87%	22.22%	18.60%	
Duration (months)	5.47 (10.69)	4.10 (5.61)	7.76 (15.76)	*
2 months	42.61%	44.44%	39.53%	
4 months	28.70%	36.11%	16.28%	**
10 months	28.70%	19.44%	44.19%	***

Note: The average employment conditions in companies are derived from the worker follow-up survey. Standard deviations in parenthesis for continuous variables. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$ for comparison of Ica and La Libertad (t-test for continuous variables; chiz test for categorical variables)

Table 4: Mixed Logit Estimates for Stated Preference Data

	by Region					by District						
	Full Sample	Ica	La Libertad	Ica city	Parcona	Aquijes	Salas	Santiago	Trujillo	Moche	Viru	Chao
Mean												
Weekly wage	0.028*** (0.002)	0.031*** (0.004)	0.026*** (0.004)	0.017 (0.014)	0.031*** (0.011)	0.031** (0.013)	0.045*** (0.007)	0.029*** (0.007)	0.131*** (0.050)	0.029*** (0.010)	0.027*** (0.005)	0.027*** (0.009)
Contract	0.602*** (0.053)	0.587*** (0.077)	0.632*** (0.075)	1.140*** (0.320)	0.512** (0.239)	1.081*** (0.354)	0.687*** (0.147)	0.429*** (0.128)	2.257** (0.890)	0.645*** (0.242)	0.804*** (0.122)	0.605*** (0.175)
Duration '4 months'	0.107 (0.080)	0.03 (0.111)	0.145 (0.116)	-0.096 (0.446)	0.653 (0.432)	0.053 (0.466)	0.114 (0.192)	-0.215 (0.211)	-0.399 (1.127)	0.119 (0.387)	0.389** (0.158)	-0.427 (0.297)
Duration '10 months'	0.048 (0.044)	-0.017 (0.061)	0.104* (0.062)	0.295 (0.219)	-0.2 (0.216)	0.041 (0.236)	-0.085 (0.110)	-0.033 (0.126)	-1.649** (0.702)	0.341 (0.217)	0.071 (0.087)	0 (0.161)
Treatment 'normal'	0.986*** (0.062)	1.022*** (0.089)	0.976*** (0.090)	1.971*** (0.454)	1.163*** (0.313)	1.791*** (0.465)	0.914*** (0.149)	1.180*** (0.199)	0.964 (0.659)	1.126*** (0.296)	1.100*** (0.130)	1.195*** (0.236)
Treatment 'good'	1.462*** (0.076)	1.433*** (0.106)	1.506*** (0.107)	2.039*** (0.427)	1.859*** (0.399)	2.441*** (0.554)	1.330*** (0.189)	1.633*** (0.224)	2.236** (1.024)	1.782*** (0.366)	1.747*** (0.169)	1.621*** (0.283)
Training 'basic'	0.552*** (0.049)	0.582*** (0.071)	0.548*** (0.067)	1.219*** (0.299)	0.379* (0.203)	1.171*** (0.384)	0.553*** (0.127)	0.531*** (0.142)	-0.61 (0.475)	0.274 (0.194)	0.614*** (0.100)	0.896*** (0.185)
Training 'a lot'	0.536*** (0.051)	0.572*** (0.070)	0.502*** (0.077)	1.141*** (0.279)	0.715*** (0.218)	1.016*** (0.314)	0.505*** (0.124)	0.507*** (0.141)	-1.340* (0.810)	0.476** (0.209)	0.531*** (0.096)	0.572*** (0.210)
Standard Deviation												
Contract	0.590*** (0.064)	0.543*** (0.089)	0.598*** (0.092)	1.072*** (0.387)	0.625** (0.256)	1.174** (0.500)	0.613*** (0.137)	0.416** (0.179)	3.186** (1.272)	0.538 (0.380)	0.756*** (0.123)	0.672*** (0.240)
Duration '4 months'	0.607*** (0.122)	0.653*** (0.150)	0.689*** (0.168)	-1.435*** (0.520)	0.514 (0.519)	-1.283*** (0.470)	-0.626** (0.264)	0.628* (0.335)	-2.403 (1.648)	0.919*** (0.319)	-0.504 (0.313)	0.902** (0.358)
Duration '10 months'	0.363*** (0.081)	-0.280** (0.120)	0.351*** (0.132)	-0.12 (0.360)	-0.292 (0.404)	0.802** (0.379)	0.389** (0.183)	0.376* (0.194)	3.807*** (1.376)	-0.847*** (0.323)	0.386*** (0.139)	0.323 (0.231)
Treatment 'normal'	0.242*** (0.090)	0.239** (0.109)	0.347*** (0.081)	0.166 (0.367)	-0.14 (0.324)	-0.385 (0.381)	0.332** (0.165)	0.410** (0.161)	-1.661** (0.762)	0.701*** (0.263)	0.267* (0.149)	-0.492* (0.261)
Treatment 'good'	-0.372*** (0.081)	0.391*** (0.116)	0.282** (0.122)	-0.688** (0.277)	-0.018 (0.232)	-0.656 (0.410)	-0.570*** (0.188)	-0.540** (0.224)	-1.396* (0.720)	-0.489* (0.281)	-0.267* (0.138)	-0.567* (0.293)
Training 'basic'	0.305*** (0.080)	0.354*** (0.105)	-0.221 (0.163)	-0.622 (0.597)	0.002 (0.254)	0.768*** (0.283)	0.394** (0.173)	0.488*** (0.172)	-1.077* (0.574)	-0.455 (0.307)	0.454*** (0.155)	-0.045 (0.345)
Training 'a lot'	0.434*** (0.072)	0.392*** (0.115)	0.580*** (0.095)	-0.262 (0.408)	0.023 (0.240)	0.099 (0.308)	0.549*** (0.176)	0.428** (0.200)	4.650*** (1.739)	-0.585* (0.329)	0.408*** (0.144)	1.038*** (0.298)
No. of Obs.	7347	3636	3711	522	345	429	1299	1041	264	522	2151	774
Log-likelihood	-1978.22	-978.85	-990.13	-119.24	-82.23	-104.58	-353.57	-279.12	-69.36	-141.91	-541.26	-201.47

Note: Significant coefficient estimates are indicated with * p<0.1, ** p<0.05 or *** p<0.01; Standard errors in parenthesis

Table 5: Determinants of Match between WTP RE and Maximum WTP EO Estimates

	Dep Var=1 if perfect match between SP and RP			Dep Var: difference between WTP RE and max WTP EO		
	Logit Model			Tobit Model		
Female (vs male)	-0.046	***	(0.010)	-2.421		(2.240)
Age	0.172	*	(0.088)	-12.75		(22.420)
Age2	-0.004	*	(0.002)	0.324		(0.550)
Migration (vs non migrant)	0.031		(0.024)	-3.279	***	(0.329)
Education (0 - 17 years)	-0.003		(0.002)	0.737		(1.300)
Land (=1 if HH cultivates land)	-0.033		(0.036)	0.71		(8.317)
Single (vs cohabitant or married)	-0.034		(0.052)	3.456		(3.661)
Female headed HH (vs male head)	-0.014	***	(0.005)	1.106	*	(0.579)
Household size	0.003		(0.007)	-0.316		(0.766)
Number of HH assets (1-13)	0.028	***	(0.009)	-2.181	***	(0.130)
Mother employed in agroindustry	-0.076		(0.058)	7.522	***	(1.579)
Father employed in agroindustry	-0.006		(0.023)	-5.935	*	(3.489)
Work aspiration at the age of 40: Employ in Non Agroind (versus Agroind)	0.024	*	(0.013)	-3.59		(4.054)
Number of workers in 2013 ^(a)	0.028	***	(0.006)	-7.748	***	(0.567)
Number of workers in 2013 ^2	-0.020	***	(0.001)	0.498	***	(0.017)
Formal company (=1 if formal)	0.16	***	(0.047)	1.481		(6.226)
Number of months actively producing	0.003	***	(0.000)	-1.332	***	(0.175)
Comp owns processing plant (vs only land)	-0.049	***	(0.009)	8.731		(7.827)
District FE	yes			yes		
No. of Obs.	390			413		

Note: Average marginal effects are reported; Standard errors clustered at the region level in parenthesis; Significant coefficient estimates are indicated with * p<0.1, ** p<0.05 or *** p<0.01; Model 1: one district predicts failure perfectly; Model 2: 'formal company' and three districts predict failure perfectly; (a) in 100 workers

APPENDIX

Figure A1: Example of a choice card, as shown to respondents

Tarjeta de elección # 3		Juego A		
	Empresa 1	Empresa 2	Empresa 3	
Durada del trabajo, sin descanso temporal	4 meses en empresa con rotación de cultivos	4 meses en empresa con rotación de cultivos	2 meses en empresa (temporada)	
Capacitaciones	Ninguna capacitación	Capacitación de las técnicas de producción	Ninguna capacitación	
Pago semanal – con descuentos	220 Soles/ semana	190 Soles/semana	190 Soles/ semana	
Contrato	Con contrato	Sin contrato	Con contrato	
Trato	Bueno (no gritos)	Malo (gritos)	Regular	

Table A2: Comparison Mixed Logit Estimates from Stated and Revealed Preference Data

	Stated Preferences			Revealed Preferences		
	Coeff		Std error	Coeff		Std error
Mean						
Weekly wage	0.028	***	(0.002)	0.014	**	(0.007)
Contract	0.602	***	(0.053)	1.038	***	(0.373)
Duration '4 months'	0.107		(0.080)	-0.199		(0.128)
Duration '10 months'	0.048		(0.044)	0.055		(0.090)
Treatment 'normal'	0.986	***	(0.062)	0.262	***	(0.072)
Treatment 'good'	1.462	***	(0.076)	0.008		(0.288)
Training 'basic'	0.552	***	(0.049)	0.336	***	(0.124)
Training 'a lot'	0.536	***	(0.051)	0.294	***	(0.104)
Standard Deviation						
Contract	0.59	***	(0.064)	1.514	***	(0.566)
Duration '4 months'	0.607	***	(0.122)	0.63	**	(0.267)
Duration '10 months'	0.363	***	(0.081)	-0.005		(0.182)
Treatment 'normal'	0.242	***	(0.090)	0.206		(0.223)
Treatment 'good'	-0.372	***	(0.081)	0.486		(0.437)
Training 'basic'	0.305	***	(0.080)	0.785		(0.560)
Training 'a lot'	0.434	***	(0.072)	0.25		(0.455)
No. of Obs.	7347			9852		
Log-likelihood at convergence	-1978.22			-1122.68		

Note: Significant coefficient estimates are indicated with * $p < 0.1$, ** $p < 0.05$ or *** $p < 0.01$

Figure A2: Relationship between parameters from stated and revealed preference mixed logit models

