



Heterogeneity in subjective wellbeing: An application to occupational allocation in Africa[☆]



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ARTICLE INFO

Article history:

Received 21 January 2014

Received in revised form

11 November 2014

Accepted 19 December 2014

Available online 3 January 2015

JEL classification:

C35

J2

J3

J41

L26

I32

O17

Keywords:

Subjective wellbeing

Mixed ordered probit

Self-employment

Informality

Developing country labor markets

Africa

ABSTRACT

By exploiting recent advances in mixed (stochastic parameter) ordered probit estimators and a unique longitudinal dataset from Ghana, this paper examines the distribution of subjective wellbeing across sectors of employment. We find little evidence for the overall inferiority of the small firm informal sector relative to the formal salaried sector at the conditional mean. Moreover, the estimated underlying random parameter distributions unveil substantial latent heterogeneity in subjective wellbeing around the central tendency that fixed parameter models cannot detect. All job categories contain substantial shares of both relatively happy and disgruntled workers.

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1. Introduction

Subjective measures of job and life satisfaction have proven good proxies for both job quality and wellbeing (see e.g. Oswald, 1997; Frey and Stutzer, 2002), important determinants of economic behavior, and powerful predictors of job tenure

[☆] The views expressed here are those of the authors and do not necessarily represent the views of the World Bank, its Executive Board or member countries. We are grateful to Kathleen Beegle, Caroline Freund, Francis Teal, Carolina Sanchez Paramo, Mary Hallward-Driemeier, seminar participants at the World Bank, the Tinbergen Institute and the University of Oxford, as well as attendants of the 2011 CSAE and NEUDC conferences for valuable comments and to the World Bank's Research Support Budget Committee for funding. All errors are our own.

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(e.g. Freeman, 1977; Akerlof et al., 1988), productivity (e.g. Oswald et al., 2013) and future earnings (e.g. Wright and Staw, 1999). They are particularly useful tools in assessing the relative desirability of different employment sectors since the weights needed to combine various observable job characteristics into a unidimensional metric are typically not known and may vary across individuals with different preferences (Clark and Senik, 2010),¹ and because some of the most important job attributes may be unobservable. For example, settling the debate over whether self-employment is a desirable option relative to salaried employment has been complicated by the difficulty of measuring and weighting such factors as the appropriate risk premium, aversion to hierarchy, or the value of flexibility. Subjective indicators mitigate these problems by virtue of being comprehensive and relying on individuals' own weighting of various attributes, and consistently suggest the existence of a self-employment satisfaction premium, both in developed and developing countries (Blanchflower and Oswald, 1998; Blanchflower, 2000; Idson, 1990; Benz and Frey, 2008a,b).

However, the central tendency of the satisfaction premium alone may be insufficient to capture the richness of the processes that determine sectoral allocation and subjective wellbeing. For instance, Evans and Leighton (1989) also argue for the presence in self-employment in the U.S. of “misfits cast off from wage work” who are likely to have experienced a fall in satisfaction in the transition from wage to self-employment.² It is thus possible that despite a positive *average* premium in self-employment, for a large share of individuals in the sector the premium is negative. More generally, the notion of latent heterogeneity underpins many matching models of the labor market, and is often appealed to in explaining why agents with identical observable characteristics exhibit differential responses to common shocks, such as policy changes. A crucial feature of these types of models is that individuals differ in the amount of utility they derive from being in a particular job. Such differences may arise from differences in the preferences of the worker, or the characteristics of the job. Hence, exploring latent heterogeneity of satisfaction within sectors is important for our understanding of labor markets.

This paper undertakes such an exploration by using recent advances in stochastic random parameter (mixed) discrete choice models to provide a more complete description of the distribution of subjective welfare across employment sectors. We do so in the developing country context where the role and implications of the extensive self-employed and small firm sector have been intensely debated for decades. We focus on informal employment, defined here as working in private firms with fewer than 5 employees, either as a proprietor or a wage employee. Our definition of informality is out of necessity based on firm size, and not on contract type or social protection, as we lack detailed data on these. In doing so, we build on an established literature³ and international statistical conventions ratified by the International Labor Organization (ILO) and the United Nations (UN), which have long included a firm-size definition of informality as one of their principal metrics.⁴

While the advanced country literature stresses the desirability of independence and being one's own boss that self-employment and the small firm sector offer, the developing country literature has tended to conclude from the attendant lack of social protection, and the association with poverty more generally, that such jobs are the inferior part of a highly segmented labor market.⁵ However, demonstrating segmentation requires showing that, at the margin, utility is not equated across sectors; the existence of marginal utility differentials would imply that workers would be better off working in a different segment of the labor market than the one in which they are employed. Wages have often been used to proxy marginal utility and assess segmentation, but this is problematic since conditional wage premia may reflect compensating differentials for other job characteristics that may be difficult to quantify (e.g. risk, independence, taxes avoided, the perceived value of benefits, or training). Subjective measures of satisfaction offer a useful alternative metric for characterizing the informal sector.

¹ Relatedly, in explaining why objective and subjective poverty measures diverge significantly in Russia Ravallion and Lokshin (2002) suggest that the weights assigned to different elements used to construct objective poverty lines might be inappropriate and that the low dimensionality of the objective measure of poverty misses key dimensions of perceived poverty

² According to Evans and Leighton (1989, p. 532); “The disadvantage theory which views entrepreneurs as misfits cast off from wage work is consistent with many of our findings. People who switch from wage work to self-employment tend to be people who were receiving relatively low wages, who have changed jobs frequently, and who experienced relatively frequent or long spells of unemployment as wage workers.”

³ To give a few examples, in a study on Central America Funkhouser (1996) defines informal enterprises as those having fewer than 5 employees; similarly, in a study of informality in Kenya Livingstone (1991) uses a cutoff of 10 employees; Falco et al. (2011) use a cutoff of 5 employees to define informality in Ghana. Pradhan and van Soest (1995, 1997) and Maloney (1999) consider enterprises with fewer than 6 employees in Bolivia and Mexico, respectively, informal. Marcouiller et al. (1995) adopt a similar definition to define informality in Mexico, El Salvador and Peru.

⁴ The firm size criterion was formally adopted by the International Labor Organization by means of the Resolution Concerning Statistics of Employment in the Informal sector at the Fifteenth International Conference of Labor Statisticians in 1993. The Resolution left the exact size cut-off to be determined according to national circumstances, but in 1999 the UN Expert Group on Informal Sector Statistics (Delhi Group) recommended that for international reporting the size-criterion should be defined as less than five employees.

⁵ Most evidence for segmentation relies on the observation that there is a sizeable formal sector wage premium; larger firms pay workers with otherwise similar observable characteristics more (see Söderbom et al., 2006); and sorting is a key determinant of differences in labor income (Fafchamps et al., 2009). Yet evidence based on longitudinal data on labor market transitions from Latin America (see e.g. Maloney, 1999; Gong and Van Soest, 2002; Gong et al., 2004; Bosch and Maloney, 2006, 2010) suggests that characterizing self-employment as inferior to wage employment may be inappropriate since for many workers self-employment is a desirable alternative to formal sector employment, offering more flexibility and better pay. Although studies of this type are less prevalent in Africa, there are signs that African labor markets may not be highly segmented. To start with, average wages have been surprisingly responsive to unemployment rates (Kingdon et al., 2005). Secondly, while earnings vary systematically across sectors and are higher in formal wage employment, there is tremendous heterogeneity in returns within wage- and self-employment (Falco et al., 2011); many of the self-employed earn more than comparable individuals in wage jobs. Moreover, Günther and Launov (2006) test the dualistic labor market hypothesis by means of a mixture model that allows for endogenous segment selection using data from Cote d'Ivoire and reject it in favor of the Cunningham and Maloney (2001) and Fields (2005) views that argue that the informal sector has its own internal dualism.

To this end, we exploit the Ghana Urban Household Panel Survey (GUHPS), a data set unique in the African context and one of the very few longitudinal datasets in either the developing or advanced world containing several measures of subjective satisfaction with work, life and finances. By income, Ghana is broadly representative of sub-Saharan Africa and offers insight into low and lower middle income countries more generally.⁶ The GUHPS permits us to study job satisfaction across sectors, to control for unobserved heterogeneity, and thus to better characterize developing country labor markets and assess how well findings from the developed country literature generalize to them. Using conventional ordered categorical data models, we first test for the existence of self-employment and small firm satisfaction premia. This is important because the small scale sector accounts for the majority of employment in developing countries, sometimes employing 70–80% of the labor force, particularly in Africa (see [Kingdon et al., 2005](#); [Jutting et al., 2009](#); [Gindling and Newhouse, 2014](#)). In addition, studies of job satisfaction in developing countries are scarce (see [Clark and Senik, 2010](#), for a review of the literature) and, moreover, tend to focus on a select subset of workers ([Mulinge and Mueller, 1998](#)), and rely exclusively on cross-sectional datasets ([Pratap and Quintin, 2006](#); [Perry et al., 2007](#); [Bóo et al., 2010](#); [Pages and Madrigal, 2008](#)).

More specifically, we test whether the relative satisfaction premia for self-employment and informal salaried employment are more consistent with a competitive or a dualistic conceptualization of the informal sector. The competitive view, which seems to characterize OECD labor markets, contends that self-employment is mostly voluntary in nature, and a desirable alternative to wage employment. Consistent with this view, only a small fraction of entrepreneurs in OECD countries start their business ‘out of necessity’ (i.e. due to lack of better work opportunities) ([Poschke, 2013](#)). By contrast, the dualistic view stipulates that self-employment and small-scale wage employment are less desirable than formal wage employment, and serve as a repository for surplus labor for those lacking alternative income earning opportunities. This may be a more appropriate description of entrepreneurship in non-OECD labor markets, where a larger share of workers are self-employed due to lack of better options (see [Margolis, 2014](#)). To discriminate between these competing views, we examine whether there is a positive satisfaction premium associated with formal jobs that would signal that markets are not competitive.

We then confront heterogeneity in conditional satisfaction head on by means of mixed (random parameter) ordered probit models. These models extend the mixed logit model to ordinal responses and can be seen as a generalization of the latent class techniques used by [Clark \(2004\)](#). The mixed model not only enables us to identify the mean premium associated with being in a particular sector, but also to assess whether, and to what extent, conditional job satisfaction varies within those sectors. It also enables quantification of both what fractions of workers are voluntary or involuntary in each sector, and the degree of dispersion of satisfaction. Further, the panel dimension allows us to estimate a random effect mixed ordered probit model. This allows us to control for individual-specific predispositions that affect self-reported satisfaction across all sectors. The results also shed light on the empirical relevance of multi-sector labor market models (see e.g. [Fields, 2005](#)), including those that stipulate that the informal sector has its own internal dualism and should therefore be characterized by heterogeneity in self-reported job satisfaction.

Finally, we conduct a number of robustness checks. First, we assess the robustness of our results using the fixed effects ordered logit model proposed by [Ferrer-i Carbonell and Frijters \(2004\)](#). Second, we test for robustness of the results to alternate measures of wellbeing, notably life and financial satisfaction and examine whether differences in job satisfaction are driven by tradeoffs among these (as suggested by [Benz and Frey \(2008a\)](#)).

The remainder of this paper is organized as follows. Section 2 presents our econometric strategy and formulates the mixed ordered probit model. Section 3 describes our data, explains how subjective wellbeing is measured, and presents descriptive statistics. Section 4 presents our baseline results using specifications that are standard in the literature. Section 5 presents estimates using our mixed ordered estimators. Section 6 presents robustness checks. A final section concludes.

2. Parameter heterogeneity in ordered choice models

The random parameter (mixed) ordered probit model allows for parameter heterogeneity in the explanatory variables. This has several advantages over the standard ordered choice model used for the analysis of categorical dependent variables ([McKelvey and Zavoina, 1975](#)). First, as pointed out by [Greene and Hensher \(2010b\)](#), the fixed parameter version of the ordered choice model (and in fact limited dependent variable models) cannot describe the unobserved heterogeneity likely to be present across agents. For example, if individuals have differing preferences vis a vis a particular labor market state, individual marginal utilities may deviate from the mean of the coefficient generated by standard models. The variance of these utilities is potentially as informative as their average, and random parameter models allow us to estimate both. For instance, if there is no heterogeneity (and conditional mean satisfaction premia are significantly different from each other), it is possible to (unambiguously) rank different employment sectors in terms of their relative desirability. In the presence of heterogeneity, however, even a substantial discount in mean satisfaction premia may conceal that for many workers, the on-average inferior sector may be, in fact, preferred. The ranking of sectors then becomes much more difficult. As another example, models predicated on the notion that the informal sector has its own internal dualism postulate substantial heterogeneity in self-reported job satisfaction within the informal sector.

⁶ Ghana's 2010 GNI per capita of \$US1230 is roughly the average for sub-Saharan Africa (\$US1176). Though reliable representative labor market data are fairly sparse, our estimate of the share of self-employment is broadly similar to that for sub-Saharan Africa.

Second, the panel dimension of our data also allows us to control for individual-specific random effects that may be present in the data and spuriously inflate the estimated variance in satisfaction with different job categories. We estimate a model of generalized ordered choice that addresses both issues.⁷

The random coefficients (associated with job status) are assumed independently normally distributed $\beta_i \sim f(\beta, \Omega)$ and

$$\beta_i = \beta + \mathbf{W}\mathbf{v}_i \quad (1)$$

where \mathbf{W} is a diagonal matrix whose elements are standard deviations⁸, and $\mathbf{v}_i \sim N(0, 1)$.

As [Hensher and Greene \(2003\)](#) note, the choice of the underlying parameter distribution must be made a priori. We use the normal distribution for two reasons. First, it permits estimation of coefficients of both signs which is essential for our analysis of the relative desirability of different sectors ([Revelt and Train, 1998](#)). Second, if unobserved heterogeneity is viewed as the sum of small influences, then the central limit theorem can be invoked to justify the normality assumption ([Greene and Hensher, 2010b](#)). One disadvantage of the normal distribution is that it has infinite tails, which may result in some individuals having extreme coefficient values. We also experiment with other distributions such as the uniform and the triangular distribution which also allow positive and negative coefficients and have shorter tails, but the qualitative pattern of results is not contingent on which distribution is assumed.⁹

We further assume that the decision maker's happiness follows an underlying random utility or latent regression model:

$$y_{it}^* = \beta_i' \mathbf{x}_{it} + \delta' \mathbf{z}_{it} + \mu_i + \epsilon_{it}, \quad i = 1, \dots, N \quad t = 1, \dots, T_i \quad (2)$$

$$y_{it}^* = (\beta + \mathbf{W}\mathbf{v}_i)' \mathbf{x}_{it} + \delta' \mathbf{z}_{it} + \mu_i + \epsilon_{it}$$

where \mathbf{x}_{it} is a vector of covariates related to job status, \mathbf{z}_{it} is a vector of covariates related to other controls whose distribution is not of interest; β_i and δ both contain unknown marginal utilities. The first captures the heterogeneity of the population with respect to satisfaction with each job type and μ_i represents an individual-specific random effect. Note that this specification nests both a standard random effects ordered probit model, in which only the constant term is allowed to vary, and a standard ordered probit, in which all random parameters are constrained to be zero (see [Greene and Hensher, 2010b](#)).

As is standard in the ordered choice literature, it is assumed that:

$$y_{it} = j_T \quad \text{if and only if} \quad \kappa_{j-1} < y_{it}^* \leq \kappa_j \quad j = 1, \dots, J$$

where the J outcomes are obtained by dividing the real line, represented by y_{it}^* into J intervals, using $J+1$ constant but unknown threshold parameters $\kappa_0, \dots, \kappa_J$. In order to ensure well-defined intervals, we need to assume ascending thresholds such that $\kappa_0 < \dots < \kappa_J$. We code the intervals from 1 to J and account for the ordinal nature of our data since higher values of y_{it}^* yield higher outcomes of y_{it} . Then, conditioned on \mathbf{v}_i , the observations y_{it} , $t = 1, \dots, T_i$ are independent, so the contribution to the conditional likelihood for individual i is the joint probability:

$$Pr[y_{i1} = j_1, \dots, y_{iT} = j_T | \mathbf{x}_{it}, \mathbf{z}_{it}, \mathbf{v}_i] = \prod_{t=1}^{T_i} F(\kappa_j - (\beta + \mathbf{W}\mathbf{v}_i)' \mathbf{x}_{it} - \delta' \mathbf{z}_{it}) - F(\kappa_{j-1} - (\beta + \mathbf{W}\mathbf{v}_i)' \mathbf{x}_{it} - \delta' \mathbf{z}_{it}) \quad (3)$$

where $\mathbf{x}_{1,it} = 1$; $F(\cdot)$ is the distribution of the error terms in which $F(\cdot) = \Phi(\cdot)$ if the error terms follow a standard normal distribution.¹⁰ Eq. 3 contains the unobserved random terms \mathbf{v}_i which must be integrated out for estimation:

$$Pr[y_{it} = j | \mathbf{x}_i, \mathbf{z}_i] = \int Pr[y_{it} = j_T | \mathbf{x}_{it}, \mathbf{z}_{it}, \mathbf{v}_i] f(\mathbf{v}_i) d\mathbf{v}_i \quad (4)$$

The model is estimated by simulated maximum likelihood (see [Train, 2003](#), for a thorough explanation of the estimation of discrete choice models by simulation). The simulated log likelihood function is given by:

$$SLL(\kappa, \beta, \mathbf{W}, \delta) = \sum_{i=1}^N \log \frac{1}{R} \sum_{r=1}^R \prod_{t=1}^{T_i} (F(\kappa_j - (\beta + \mathbf{W}\mathbf{v}_{ir})' \mathbf{x}_{it} - \delta' \mathbf{z}_{it}) - F(\kappa_{j-1} - (\beta + \mathbf{W}\mathbf{v}_{ir})' \mathbf{x}_{it} - \delta' \mathbf{z}_{it})) \quad (5)$$

where \mathbf{v}_{ir} is the r th random draw for each individual. We use Halton draws because the literature suggests that these are superior to standard draws in this context.¹¹ Elimination of the stochastic component of β would yield a standard ordered

⁷ Further extensions of ordered choice models with observed and unobserved heterogeneity are presented in [Greene and Hensher \(2010b\)](#) and [Greene and Hensher \(2010a\)](#).

⁸ One could also specify the coefficients to be dependently distributed. In this case, the coefficient vector is expressed $\beta_i = \beta + \mathbf{L}\mathbf{v}_i$ where \mathbf{L} is a lower-triangular Cholesky factor of Ω , such that $\mathbf{L}\mathbf{L}' = \Omega$ and where β and \mathbf{L} are estimated.

⁹ Results are available from the authors upon request.

¹⁰ We need to impose the normalization $\kappa_0 = 0$ in order to estimate the constant parameter.

¹¹ [Bhat \(2001\)](#)'s Monte Carlo analysis found the error measures of the estimated parameters was smaller using 100 [Halton \(1960\)](#) draws than 1000 random numbers in mixed logit models.

probit with random effects. Likewise, if $T = 1$, then the simulated log likelihood collapses to a simulated estimation of the pooled sample or cross section.

Care must be taken in interpreting the documented relationships causally. It is possible, for example, that happier people choose to be self-employed, for example. However we suspect this is not the case. In the robustness checks in Section 5.1, we control for time-invariant fixed effects in a fixed parameter ordered logit context which strips out time invariant unobserved heterogeneity. Hence we can rule out that on average happier people are found in one sector or another. As we show, the results are very similar to those generated with the random parameter ordered probit suggesting that the same is true there. Extracting the average ‘happiness’ fixed effect, of course, cannot rule out the impact of variations in happiness around that average level – that an individual may move to a particular sector on a good day and would not have on a bad day. However, since job selection is a longer term decision, we consider moves based on such transitory emotional swings to be less probable.

3. Data and descriptive statistics

3.1. The Ghana Urban Household Panel Survey

The Ghana Urban Household Panel Survey (GUHPS) conducted by the Centre for the Study of African Economies provides the basis for our empirical analysis. It collects information on inter alia, incomes, education, labor market experience, household characteristics and subjective wellbeing of individuals in the four largest urban centers of Ghana: Accra (and neighboring Tema), Kumasi, Takoradi and Cape Coast. The sampling scheme is based on a stratified random sample of urban households from the 2000 census in Ghana. Thus, the data are roughly representative of urban labor markets. The data span a 7 year period from 2004 until 2010, but the 2007 wave is a recall wave in which no indicators of subjective wellbeing were collected and is therefore excluded from the present analysis.

Personal characteristics and labor market indicators: The survey contains the standard measures of age, years of education, gender, whether the respondent is married and is the head of the household, city of residence and ethnicity. We further construct height Z-scores conditional on gender and crude age category¹² as a proxy for the general health of the respondent.

For wage employees the earnings variable measures real monthly wage income, while for the self-employed the real earnings measure is based on enterprise profits. Thus, earnings for self-employed workers reflect both the returns to capital and the returns to labor. In addition to containing information on hours worked, the survey includes three questions that allow greater precision in the measure of conditional wages: tenure in the present job; years in the formal sector, and whether or not the present position is an apprenticeship.

We are also able to construct a measure of household assets from questions on whether the family owns a bike, telephone, electric stove, motorcycle, car, etc. It does not include financial assets.

Satisfaction measures: Our subjective wellbeing measures are provided by the answer to the question: “All things considered, how satisfied are you with your current work? (/life?/financial situation?)”. In all three cases, the options given to respondents were: “1. Very Dissatisfied, 2. Dissatisfied, 3. Neither Satisfied Nor Dissatisfied, 4. Satisfied, 5. Very Satisfied”. Information on subjective job satisfaction was collected in all waves (except the recall wave), while information on life- and financial satisfaction was collected in four waves.

3.2. Employment states

For the purpose of this analysis, we distinguish between five paid employment states among workers who respond affirmatively to the standard question about whether they have done any work for pay, profit or gain for the last seven days, even if for one hour only.¹³

Self-employed, with employees and self-employed without employees: We divide individuals who declare themselves to be self-employed into two categories to allow greater discrimination between those who may be more “entrepreneurial” (and hence able to hire employees) and those who are perhaps in a disguised unemployment subsistence state until their next job. The division is crude, but it is preferred to a simple aggregate of the two, as it captures an important dimension of heterogeneity.

Informal salaried and formal salaried workers: We define informal salaried workers to be those working for wages in firms with up to 5 workers. Conversely, we define formal employees as wage employees in large firms, i.e. firms with more than 5 workers.

Civil service/public sector workers: We treat workers in the public sector as a separate “formal” category for two reasons. First, wage setting and non-monetary compensation may differ from that in the private sector. Second, a popular perception

¹² Z-scores are constructed by standardizing respondents' height relative to other respondents of the same gender in the same age category, where we pool all people between 24 and 65 into one category, and have separate categories for all of the ages between 15 and 23 as individuals may still grow during those years.

¹³ We do not have a variable for whether a worker is covered by the sparse social protection programs that exist nor for whether a firm is officially registered, hence we base our categorizations of formality on firm size.

Table 1

Summary statistics: Ghana Urban Household Panel Survey (GUHPS).

	Self-employed, employees		Self-employed, no employees		Informal salaried		Formal salaried		Civil	
	Mean	SD	Mean	SD	Mean	SD	Mean	SD	Mean	SD
Job satisfaction	3.49	1.03	3.27	1.00	3.18	1.01	3.33	0.94	3.53	1.04
Life satisfaction	3.57	0.85	3.23	0.89	3.13	0.90	3.30	0.90	3.49	0.92
Financial satisfaction	2.89	1.08	2.67	0.97	2.46	0.88	2.59	0.97	2.82	1.08
Male	0.40	0.49	0.26	0.44	0.55	0.50	0.75	0.43	0.63	0.48
Education	8.35	3.80	7.52	4.04	8.64	3.58	10.20	3.16	11.43	3.16
Age	39.35	10.16	36.94	10.15	30.76	10.04	33.22	10.25	38.33	11.73
Height	0.07	0.92	-0.01	1.08	0.01	0.85	-0.01	0.90	0.23	0.93
Married	0.68	0.47	0.57	0.49	0.31	0.46	0.39	0.49	0.56	0.50
Household head	0.55	0.50	0.45	0.50	0.43	0.50	0.52	0.50	0.62	0.49
Apprentice	0.01	0.08	0.00	0.06	0.10	0.29	0.06	0.24	0.01	0.11
Tenure (log)	1.85	1.01	1.89	1.01	1.12	0.74	1.44	0.84	1.49	1.07
Hours (log)	3.86	0.53	3.79	0.52	3.83	0.48	3.78	0.40	3.70	0.38
Earnings (log)	3.88	1.27	3.26	1.05	3.14	0.83	3.77	0.85	4.06	0.80
Household assets (log)	5.38	1.29	4.80	1.42	4.74	1.43	5.12	1.47	5.30	1.24
Control	2.32	0.81	2.26	0.85	2.15	0.85	2.41	0.78	2.49	0.75
Bad mood	0.05	0.22	0.15	0.36	0.13	0.33	0.09	0.29	0.10	0.30
Good mood	0.12	0.32	0.06	0.24	0.05	0.21	0.08	0.26	0.10	0.31
Wage and manufacturing	0.00	0.00	0.00	0.00	0.18	0.38	0.39	0.49	0.06	0.25
Self and trade	0.39	0.49	0.62	0.49	0.00	0.00	0.00	0.00	0.00	0.00
Wage and not a manual laborer	0.00	0.00	0.00	0.00	0.26	0.44	0.46	0.50	0.68	0.47
Percentage	13.11		46.80		16.13		15.73		8.14	
Observations	425		1520		523		510		264	

Note: The GUHPS covers labor force participants ages 15–60 in the four largest urban centers of Ghana: Accra (and neighboring Tema), Kumasi, Takoradi and Cape Coast. The sampling scheme is based on a stratified random sample of urban households from the 2000 census in Ghana and is thus broadly representative of urban labor markets. The data span a 7-year period from 2004 until 2010, but the 2007 wave is a recall wave in which no indicators of subjective wellbeing were collected and is therefore excluded from the present analysis. The five labor market states are Self-no employees (those declaring themselves self-employed, but with no employees); Self-with employees (those with employees); Informal salaried (employees in firms of up to 5 workers); Formal salaried (employees in firms over 5 workers); and Civil (civil or public sector workers). The final state combines Unpaid, out of the labor force (OLF) and unemployed.

is that public sector jobs are the most desirable jobs. We test whether subjective satisfaction premia for public employment are consistent with this hypothesis, i.e. whether they are positive.

Unpaid, out of the labor force (OLF) and unemployed: This category comprises workers who are not working for pay. It also includes those out of the labor force and those unemployed. Distinguishing between these two categories is difficult given changes in survey design over time.

3.3. Descriptive statistics

Descriptive statistics on the different types of workers are presented in Table 1. Though less commonly presented, summary statistics on the dynamic (transition) patterns are also informative and we present these in the form of a transition matrix in Table 2. Students, unpaid workers and those younger than 15 or older than 65 years of age are excluded from our sample. Several findings merit note.

First, Table 1 shows that in our sample formal salaried employment accounts for only 16% of all paid employment and civil service employment accounts for a slight 8%. Self-employment accounts for the majority (60%) of employment and thus merits the close study we bring to it. Amongst the self-employed, approximately one out of five hire at least one worker; The overwhelming majority work by themselves. The informal salaried constitute a relatively small fraction of employment at 16%. The informal sector as a whole thus accounts for more than three-quarters of all paid employment in our sample.

Women are much more likely to be self-employed, whereas formal and civil service employment are disproportionately male and informal salaried work is slightly more male. Mean educational attainment increases moving from self-employment without employees, to self-employment with employees, to informal salaried work, to formal private and civil service employment. Average age and marital status suggest important differences in where across the life cycle workers are found, with the informal salaried being younger on average, at the beginning of their professional life cycle, while the self-employed are closer to the end.¹⁴

¹⁴ The informal salaried are youngest at an average age of 31 and the formal salaried are two years older at 33. The self-employed without employees are 37 years old on average; the self-employed with employees are approximately two years older with a mean age of 39, which is just above the average age of the civil service employees (38). Only 31% of informal salaried workers are married compared to 39% for the formal salaried, 57% for self-employed without employees and 68% for self-employed with employees. The highest rate of apprenticeship is found among informal salaried workers. Small numbers of

Table 2

One year transitions across employment states.

Initial state	Current state						Total
	Self-employed employees	Self-employed no employees	Salaried informal	Salaried formal	Civil	OLF, unemployed or unpaid	
Self-employed, employees	226	130	17	18	2	45	438
	51.6	29.68	3.88	4.11	0.46	10.27	100
Self-employed, no employees	205	1076	93	34	7	219	1634
	12.55	65.85	5.69	2.08	0.43	13.4	100
Informal salaried	43	77	241	80	12	84	537
	8.01	14.34	44.88	14.9	2.23	15.64	100
Formal salaried	11	28	82	356	28	61	566
	1.94	4.95	14.49	62.9	4.95	10.78	100
Civil	1	9	8	35	159	18	230
	0.43	3.91	3.48	15.22	69.13	7.83	100
OLF, unemployed or unpaid	69	245	122	108	31	910	1485
	4.65	16.5	8.22	7.27	2.09	61.28	100
Total	555	1565	563	631	239	1337	4890
	11.35	32	11.51	12.9	4.89	27.34	100

Note: Absolute numbers of workers transiting between initial sector i and terminal sector j (Rows sum to total in initial state); and probability of transiting from i to j below (P_{ij} ; Rows sum to 100%). The five labor market states are Self-no employees (those declaring themselves self-employed, but with no employees); Self-with employees (those with employees); Informal salaried (employees in firms of up to 5 workers); Formal salaried (employees in firms over 5 workers); and Civil (civil or public sector workers). The final state combines Unpaid, out of the labor force (OLF) and unemployed. Distinguishing among these categories is difficult given changes in survey design over time.

Earnings are highest for those employed in the civil service/public sector. Self-employment with employees is next followed by formal salaried work and then by self-employment with no employees. Informal salaried employment holds up the bottom of the ranking.

Table 2 presents transition matrices for movements across sectors between survey waves, pooling all rounds of the GUHPS. These summarize the data underlying the panel estimators employed later and offer further insight into the nature of the sectors. First, as has been noted in other developing countries, there is a relatively high degree of mobility. For instance, of those declaring themselves formal salaried at the beginning of the period, only 63% were still in that sector at the end of the year. Informal salaried employment has the highest rate of turnover; the proportion of stayers is only 45%, implying that over half of the workers in this sector leave to other sectors within a year. This, and the demographic patterns noted above, are consistent with it being a sector of entry for relatively young people who are shopping around for their next (superior) employment. Further insights can be gleaned from studying the patterns of mobility among sectors although, as with the conditional wage comparisons discussed earlier, they cannot offer robust conclusions about the relative desirability of the various sectors.

Hence, we turn to an examination of the job satisfaction data. Returning to the unconditional tabulations in Table 1, several notable facts emerge. To start with, Ghanaian workers have levels of job satisfaction that are roughly similar to those documented in other countries, with most workers claiming to be either satisfied (category 4) or neither satisfied or dissatisfied (category 3) with their work, which is a fairly standard finding (see e.g. Benz and Frey (2008b) and Blanchflower (2000) for cross-country comparisons of job satisfaction).

More striking are the relative rankings within Ghana. Civil sector employees and self-employed individuals who employ others report the highest levels of job satisfaction. The difference between their job satisfaction levels is not statistically significant, even though civil sector workers earn significantly more than the self-employed who employ others. Conversely, while the average earnings of wage employees in large firms are not significantly lower than those for self-employed workers who hire other workers, their self-reported job satisfaction is significantly lower. The workers with the lowest levels of earnings and job satisfaction are wage workers in small enterprises. The standard deviations of the job satisfaction measure are large pointing towards substantial heterogeneity in satisfaction within sectors. Life and financial satisfaction exhibit similar patterns, though the self-employed who employ others have marginally higher levels of average life and financial satisfaction than public sector employees. In addition, the self-employed without employees are on average more satisfied with their financial situation than the formal salaried.

Table 3 reports the average change in job satisfaction associated with workers' transitions across sectors. As before, the standard deviations are large, pointing to substantial heterogeneity within each cell. Yet, some general patterns emerge. Moves from formality to informality are not generally associated with reductions in well-being. On the contrary, moving into self-employment with employees is associated, on average, with positive changes in well-being, which is at odds with

apprenticeships are also observed among the self-employed (this is possible if the primary job is self-employment but the worker is also engaged in an apprenticeship elsewhere). These patterns are very similar to those documented for Argentina, Brazil and Mexico (Bosch and Maloney, 2010).

Table 3

Average changes in job satisfaction by type of transition.

Initial state	Current state						
	Self-employed employees	Self-employed no employees	Salaried informal	Salaried formal	Civil	OLF, unemployed or unpaid	Total
Self-employed, employees	0.05 (1.32)	−0.19 (1.37)	0.15 (1.68)	−0.30 (0.82)	1.00 (0.00)	−0.67 (1.23)	−0.10 (1.34)
Self-employed, no employees	0.02 (1.42)	−0.19 (1.35)	0.03 (1.41)	−0.09 (1.02)	−0.50 (1.29)	−0.71 (1.22)	−0.18 (1.36)
Informal salaried	0.70 (1.27)	−0.15 (1.44)	0.00 (1.35)	−0.27 (1.17)	0.75 (1.75)	−0.56 (1.22)	−0.03 (1.36)
Formal Salaried	0.25 (0.89)	0.50 (1.29)	0.31 (1.11)	−0.18 (1.43)	0.05 (1.18)	−0.72 (1.02)	−0.09 (1.34)
Civil	0.00 (0.00)	0.00 (1.73)	0.00 (1.41)	−0.07 (1.44)	−0.11 (1.44)	−1.00 (1.31)	−0.14 (1.44)
OLF, unemployed or unpaid	0.55 (1.29)	0.42 (1.45)	0.34 (1.43)	0.40 (1.41)	0.18 (1.55)	−0.29 (1.31)	0.14 (1.42)
Total	0.17 (1.36)	−0.08 (1.39)	0.13 (1.37)	−0.10 (1.36)	−0.01 (1.43)	−0.46 (1.28)	−0.07 (1.38)

Note: Average changes in life satisfaction over two consecutive years; Standard deviations in parentheses. The five labor market states are Self-no employees (those declaring themselves self-employed, but with no employees); Self-with employees (those with employees); Informal salaried (employees in firms of up to 5 workers); Formal salaried (employees in firms over 5 workers); and Civil (civil or public sector workers). The final state combines Unpaid, out of the labor force (OLF) and unemployed. Distinguishing among these categories is difficult given changes in survey design over time.

the idea that self-employment is chosen by those lacking alternative income earning opportunities. By contrast, moves out of employment into inactivity and/or being unemployed are associated with reductions in subjective well-being.

4. Estimation

4.1. Fixed parameter ordered probit

Table 4 presents our baseline estimates of job satisfaction using conventional fixed parameter ordered probit models.¹⁵ In column 1, only dummies for job type, city and year are included. The omitted category is wage-employment in large firms. The models have low predictive power, explaining between 2% and 5% of the variation in self-reported satisfaction. The limited explanatory power of such models is typical in the literature on job satisfaction and attests to the high heterogeneity in job satisfaction across different types of jobs.

The results are broadly consistent with the statistics presented in Table 1: workers in informal wage employment have the lowest job satisfaction on average, and self-employed sole proprietors are also less satisfied than wage employees in large firms, although not significantly so. Civil sector employees are not significantly more satisfied with their jobs than workers in the formal private sector.¹⁶ Self-employed individuals with employees report the highest levels of job satisfaction conditional on ethnicity, city and year.

The following columns sequentially include three blocks of additional covariates. Column 2 introduces the standard components of labor compensation; earnings, hours worked and hours worked squared. Column 3 introduces tenure and apprenticeship variables to further condition remuneration, as well as the household assets variable which serves as a crude proxy for household wealth and may help mitigate potential measurement error in our earnings variable. The interpretation becomes then “taking into account differences in earnings, how do the other characteristics of these jobs affect perceived wellbeing?” Column 4 includes only personal characteristics, but does not condition on compensation or job characteristics. Finally, column 5 combines all covariates.

Conditioning on labor compensation (column 2) eliminates the negative coefficient on informal salaried employment. This suggests that lower earnings is the primary cause of dissatisfaction with this sector. However, being self-employed with employees remains significantly positively associated with job satisfaction even after we control for the fact that such workers tend to have higher earnings, which are significantly positively correlated with job satisfaction. The average

¹⁵ Since the analysis is based on a question about job-satisfaction, the regressions are confined to the sample of workers who are employed. It is legitimate, therefore, to hypothesize that our results will be affected by selection bias. This would be the case, for instance, if workers who are more likely to be employed are also more likely to be satisfied with their job. For two reasons, however, we do not believe this selection bias is likely to be large. First, since we will be able to control for fixed effects by means of panel data, all time-invariant unobservables (e.g. “general optimism”) can be effectively controlled for. Second, given that our analysis estimates *relative* satisfaction premia (in each category compared to an excluded one), endogenous selection into employment would matter only if unobservables had *different* effects on job-satisfaction *across* sectors. In a robustness check that we do not present to conserve space, we examined life satisfaction differentials on a sample that includes those not working and is thus not affected by selection bias. The relative pattern of life satisfaction differentials across employment categories was not affected by including those not working for pay, suggesting selection bias is likely limited.

¹⁶ We also ran regressions in which location and year were not controlled for. In these specifications, which are available upon request, public sector employment was associated with a significantly positive satisfaction premium.

Table 4

Job satisfaction: ordered probit estimates.

	(1)	(2)	(3)	(4)	(5)
Self-employed, employees	0.219*** (0.072)	0.218*** (0.072)	0.224*** (0.074)	0.255*** (0.075)	0.212*** (0.076)
Self-employed, no employees	−0.070 (0.055)	0.031 (0.056)	0.069 (0.058)	−0.023 (0.061)	0.046 (0.062)
Informal salaried	−0.141** (0.066)	−0.012 (0.068)	0.004 (0.068)	−0.121 (0.068)	−0.019 (0.069)
Civil	0.134 (0.083)	0.059 (0.084)	0.050 (0.084)	0.094 (0.085)	0.040 (0.085)
Earnings (log)		0.214*** (0.020)	0.204*** (0.020)		0.221*** (0.021)
Hours (log)		0.470* (0.257)	0.416 (0.258)		0.399 (0.259)
Hours (log) ²		−0.068* (0.039)	−0.060 (0.039)		−0.056 (0.040)
Tenure (log)			−0.021 (0.021)		−0.002 (0.022)
Apprentice			0.121 (0.117)		0.061 (0.120)
Household assets (log)			0.093*** (0.015)		0.090*** (0.015)
Male				0.019 (0.044)	−0.078* (0.045)
Age				−0.024* (0.013)	−0.040*** (0.013)
Age ² /100				0.029* (0.016)	0.047*** (0.016)
Education				−0.015 (0.014)	−0.004 (0.014)
Education ² /100				0.203** (0.095)	0.029 (0.097)
Height (Z-score)				0.039** (0.019)	0.031 (0.019)
Married				0.085** (0.043)	0.037 (0.044)
Household head				−0.079* (0.042)	−0.047 (0.044)
Ethnicity dummies	No	No	No	Yes	yes
City dummies	Yes	Yes	Yes	Yes	yes
Year dummies	Yes	Yes	Yes	Yes	yes
LL	−4234.079	−4171.594	−4149.513	−4221.036	−4138.924
Finite sample AIC	2.622	2.585	2.576	2.621	2.575
HQ IC	2.633	2.598	2.593	2.640	2.597
Pseudo- <i>R</i> ²	0.024	0.039	0.044	0.027	0.046
<i>N</i>	3242	3242	3242	3242	3242

Note: Estimation by ordered probit. The dependent variable is Job satisfaction which is an ordered variable with the following categories: 1. Very Dissatisfied, 2. Dissatisfied, 3. Neither Satisfied Nor Dissatisfied, 4. Satisfied, 5. Very Satisfied. The five labor market states are Self-no employees (those declaring themselves self-employed, but with no employees); Self-with employees (those with employees); Informal salaried (employees in firms of up to 5 workers); Formal salaried (employees in firms over 5 workers); and Civil (civil or public sector workers). Omitted category is Formal salaried. Information on subjective job satisfaction was collected in all waves except the recall wave. Finite Sample AIC corresponds to $AIC + 2M(M+1)/(n-M-1)$ and HQ IC corresponds to $(-2 \log L + 2M \log \log n)/n$ where M is the number of parameters in the model. Thresholds not reported. Standard errors in parentheses.

* $p < 0.1$.** $p < 0.05$.*** $p < 0.01$.

utility premium associated with being a small firm owner who employs others is large, especially when compared to the coefficient associated with earnings; taken at face value, moving from formal wage employment to being a small firm owner with employees would yield the same increase in job satisfaction as more than doubling earnings¹⁷ These results are robust to the third block of variables (column 3), notably tenure,¹⁸ whether or not the individual is currently an apprentice, and household assets. Household wealth is positively correlated with job satisfaction while there is no significant satisfaction premium associated with being an apprentice.

¹⁷ To see this note that the coefficient on being self-employed with employees is 0.218, whereas the coefficient on log earnings is 0.214; an increase in earnings of $\exp(0.218/0.214) \approx 277$ would thus be associated with an equivalent increase in job satisfaction).

¹⁸ We also experimented with specifications including the square of tenure, but these did not enhance the explanatory power of the model. Results are omitted to conserve space, but available upon request from the authors.

The results are also robust to including controls for individual characteristics, such as gender, age, education, height, marital status, being the head of the household and ethnicity. Column 4 includes these controls alone. The resulting coefficients on the different job type dummies can be interpreted as satisfaction differentials net of individual characteristics. As such, this specification provides a test for the segmentation hypothesis. Though the results suggest that being better educated, older,¹⁹ healthier (a higher height Z-score) and married is associated with significantly greater satisfaction, and being a household head with significantly lower satisfaction, the results of focal interest do not change appreciably from the base specification in column (1): Being self-employed with employees is associated with a satisfaction premium, being informal salaried with a satisfaction discount.

Specification 5 includes all explanatory variables; the coefficients on the job dummies now reflect satisfaction differentials net of individual characteristics, earnings, job characteristics and household assets. Although the satisfaction premium associated with being self-employed with employees remains significantly positive in all specifications, some interesting differences with specification 4 emerge; the education premium disappears suggesting that its channel of influence is through earnings. By contrast, the gender dummy which was insignificant when earnings were not conditioned on, is significantly positive now that it is controlled for; women are happier with their jobs, *ceteris paribus*, perhaps because they have lower earnings expectations (see e.g. Clark, 1997).

Comparing the different specifications, the inclusion of conditioning variables impacts the relative ranking of sectors only for informal salaried work, while the other significant premium, on self-employment with employees, is very robust.²⁰ Moreover, the negative premium associated with informal salaried work disappears once earnings are conditioned on; this suggests low average satisfaction in this sector is driven by low earnings. This is consistent with the summary statistics that suggest these are often individuals just entering the workforce, who have yet to find a good match.

4.2. Allowing for parameter heterogeneity: random parameters (mixed) ordered probit estimation

The coefficients on job sectors in the previous estimation reflect the central tendency – the average premium or discount enjoyed by individuals within a sector. However, they obscure the potential latent heterogeneity across individuals within sectors. The mixed ordered probit explicitly allows for such heterogeneity by estimating the variance of the parameters around the central tendency. Table 5 re-estimates the two most general models from the previous exercise, generating the implicit distribution of satisfaction premia associated with different jobs. The first three columns condition on individual characteristics but not earnings thereby allowing the preference parameter to include remuneration as part of conditional wellbeing. The next three columns condition on earnings, and the sectoral parameters thus represent preferences over non-remunerative characteristics of the type of employment. In each group of three we report first, a pooled specification (columns 1 and 4) that allows for random parameters (labeled “RPOP” model in the table). Subsequently, (in columns 2 and 5) we exploit the panel dimension and allow for individual-specific random effects (labeled “REOP”). Finally, (columns 3 and 6) we combine the two yielding the random parameter random effect mixed model (labeled “RPREOP”). All specifications were estimated with 100 Halton draws. Using more draws did not lead to significant changes in the estimated coefficients.

The previous results are broadly robust to allowing for parameter heterogeneity. In column 1, the mean coefficient associated with being self-employed and employing at least one other worker remains significantly positive and of similar magnitude. Informal salaried work is again associated with an average utility discount, albeit only significant at the 10% level. As before the remaining job coefficients are not significant. The significant coefficients on all the standard deviations of the job dummies, however, reveal that focusing on the central tendency alone veils useful information. For all job dummies we strongly reject the null hypothesis that there is no heterogeneity within the sector. Self-employed with employees has the greatest variance at 0.76 followed by civil employment at 0.75, informal salaried at 0.51 and self-employment with no employees at 0.46. Self-employment with employees thus offers higher highs, but also potentially lower lows than other sectors. Note, however, that the utility premium associated with civil service salaried employment has an almost equivalent variance.

It may seem counterintuitive that, for instance, self-employment without employees has an insignificant mean coefficient, but a significant estimate of the standard deviation. What this implies is that our estimate of the *distribution* of the parameter shows that there is substantial heterogeneity across agents in how they think about self employment (OLS implicitly assumes there is not). However, the positive and negative values in this distribution offset each other, leading to the average value of the parameter being insignificantly different from zero.

Perhaps the most likely potential explanation for the striking heterogeneity in satisfaction is variability in earnings within a sector. However, conditioning on compensation (column 4) hardly affects the estimated standard deviations of the job satisfaction premia associated with different sectors. While it eliminates any significant average informal salaried discount and reduces the coefficient on self-employment with employees somewhat, the differences in parameter variance are not driven by differential earnings dispersion across sectors.

¹⁹ The quadratic term quickly swamps the linear term leaving the minimum value at 4 years of age and the joint impact on job satisfaction positive after age 1.

²⁰ We also explored the role of potential attrition bias, which is limited. See the working paper version of this paper (Falco et al., 2012) for details.

Table 5

Job satisfaction: random parameter ordered probit models.

	Parameter	Without remuneration			With remuneration		
		(1) RPOP	(2) REOP	(3) RERPOP	(4) RPOP	(5) REOP	(6) RERPOP
Self-employed, employees	Mean	0.317*** (0.077)	0.255*** (0.075)	0.271*** (0.078)	0.265*** (0.078)	0.213*** (0.075)	0.230*** (0.078)
	SD	0.757*** (0.056)		0.589*** (0.054)	0.725*** (0.056)		0.544*** (0.055)
Self-employed, no employees	Mean	−0.016 (0.063)	−0.020 (0.066)	−0.021 (0.065)	0.059 (0.064)	0.047 (0.066)	0.049 (0.064)
	SD	0.463*** (0.029)		0.102*** (0.029)	0.421*** (0.029)		0.117*** (0.029)
Informal salaried	Mean	−0.122* (0.070)	−0.120* (0.073)	−0.122* (0.072)	−0.012 (0.071)	−0.020 (0.073)	−0.020 (0.073)
	SD	0.508*** (0.048)		0.255*** (0.048)	0.505*** (0.047)		0.271*** (0.048)
Civil	Mean	0.131 (0.086)	0.101 (0.084)	0.108 (0.087)	0.069 (0.087)	0.042 (0.083)	0.053 (0.087)
	SD	0.752*** (0.070)		0.414*** (0.070)	0.763*** (0.070)		0.450*** (0.071)
Earnings (log)	Mean				0.248*** (0.021)	0.224*** (0.020)	0.227*** (0.021)
Hours (log)	Mean				0.455* (0.252)	0.421* (0.248)	0.456* (0.250)
Hours (log) ²	Mean				−0.063* (0.038)	−0.060 (0.038)	−0.064* (0.038)
Tenure (log)	Mean				−0.006 (0.023)	−0.001 (0.023)	−0.003 (0.023)
Apprentice	Mean				0.070 (0.132)	0.054 (0.133)	0.056 (0.134)
Household assests (log)	Mean				0.096*** (0.016)	0.092*** (0.016)	0.090*** (0.016)
Male	Mean	0.019 (0.045)	0.023 (0.044)	0.022 (0.044)	−0.088* (0.046)	−0.076* (0.045)	−0.077* (0.045)
Age	Mean	−0.027** (0.013)	−0.023* (0.013)	−0.024* (0.013)	−0.044*** (0.014)	−0.040*** (0.013)	−0.041*** (0.013)
Age ² /100	Mean	0.033** (0.017)	0.028* (0.017)	0.030* (0.016)	0.053*** (0.017)	0.046*** (0.017)	0.049*** (0.017)
Education	Mean	−0.014 (0.015)	−0.018 (0.015)	−0.014 (0.015)	0.0001 (0.015)	−0.005 (0.015)	−0.001 (0.015)
Education ² /100	Mean	0.209** (0.097)	0.227** (0.097)	0.204** (0.097)	0.007 (0.098)	0.041 (0.099)	0.016 (0.099)
Height (Z-score)	Mean	0.044** (0.020)	0.044** (0.021)	0.045** (0.021)	0.035* (0.020)	0.034* (0.020)	0.035* (0.020)
Married	Mean	0.092** (0.044)	0.088** (0.044)	0.089** (0.044)	0.039 (0.045)	0.037 (0.045)	0.040 (0.045)
Household head	Mean	−0.099** (0.043)	−0.086** (0.043)	−0.094** (0.043)	−0.065 (0.044)	−0.052 (0.043)	−0.059 (0.043)
σ			0.283*** (0.019)	0.222*** (0.019)		0.232*** (0.019)	0.141*** (0.019)
Ethnicity dummies	Yes		Yes	Yes	Yes	Yes	Yes
City dummies	Yes		Yes	Yes	Yes	Yes	Yes
Year dummies	Yes		Yes	Yes	Yes	Yes	Yes
LL		−4210.059	−4214.922	−4207.306	−4127.878	−4136.079	−4129.292
Finite sample AIC		2.617	2.618	2.616	2.570	2.573	2.572
HQ IC		2.638	2.638	2.638	2.595	2.597	2.598
N		3242	3242	3242	3242	3242	3242
Individuals		3242	1434	1434	3242	1434	1434

Note: Estimation by random parameter ordered probit (RPOP), random effects ordered probit (REOP), random effects random parameter ordered probit (RERPOP). The dependent variable is job satisfaction which is an ordered variable with the following categories: 1. Very Dissatisfied, 2. Dissatisfied, 3. Neither Satisfied Nor Dissatisfied, 4. Satisfied, 5. Very Satisfied. The five labor market states are Self-no employees (those declaring themselves self-employed, but with no employees); Self-with employees (those with employees); Informal salaried (employees in firms of up to 5 workers); Formal salaried (employees in firms over 5 workers); and Civil (civil or public sector workers). Omitted category is Formal salaried. Information on subjective job satisfaction was collected in all waves except the recall wave. Parameters for all job types are assumed to follow a normal distribution. Random parameters estimates were estimated using 100 Halton draws. σ corresponds to random effect parameter which is estimated assuming a random constant. Finite Sample AIC corresponds to $AIC + 2M(M+1)/(n-M-1)$ and HQ IC corresponds to $(-2 \log L + 2M \log \log n)/n$ where M is the number of parameters in the model. Thresholds not reported. Standard errors in parentheses.

* $p < 0.1$.** $p < 0.05$.*** $p < 0.01$.

Table 6

Share of sector that would not prefer formal employment.

	Model (1)	Model (3)	Model (4)	Model (6)
Self-employed, employees	66%	68%	64%	66%
Self-employed, no employees	49%	42%	56%	66%
Informal salaried	41%	32%	49%	47%
Civil	57%	60%	54%	55%

Note: Computed as the proportion of the population with a positive premium as $100 \times \Phi(\beta_k/\sigma_k)$, where Φ is the cumulative standard normal distribution and β_k and σ_k is the mean and the standard deviation of the coefficient as estimated in Table 4.

Another possibility is that this heterogeneity is driven by individuals' latent personality traits affecting their self-reported satisfaction with all sectors. To allow for this possibility, we estimate models that control for individual specific random effects. Columns 2 and 5 first present specifications that exploit the panel dimension of the data and allow for individual-specific random effects but not for parameter heterogeneity. The variance of the random effect is significant at the 1% level in both cases. The estimated mean satisfaction differentials are very similar to those obtained using a fixed parameter probit.²¹

Columns 3 and 6 then combine both random effects and random parameters. Mean sector satisfaction premia are hardly affected. By contrast, the estimated standard deviations associated with the job dummies all fall substantially compared to specifications that only allow for random parameters, though they remain statistically significant. These reductions may arise because the estimated random effect σ is capturing heterogeneity that is common across all sectors, for instance, a general positive or negative attitude toward whatever situation an individual finds him/herself in. Controlling for compensation introduces only modest changes; being self-employed and employing others continues to be associated with a highly significant satisfaction premium, and again, the informal salaried now suffers no discount. As with the RPOP, conditioning on compensation diminishes the estimated variance of job parameters only marginally, if at all. Little of the variation in satisfaction appears to arise from different earnings outcomes, hours worked, or whether the job was an apprenticeship.

To facilitate the interpretation of these results, Table 6 calculates the share of the sector for whom satisfaction relative to the formal sector is greater than zero.²² The results attest to the importance of studying the heterogeneity underlying the central tendency. For instance, although our parameter estimates indicate that self-employed individuals who employ others are on average significantly happier than workers with other types of jobs, as has been found throughout the literature, the distribution of this parameter is such that for approximately a third (32%) of the self-employed who are employing others the satisfaction premium is negative when compensation is not controlled for but individual-specific random effects are. While the majority prefer self-employment, there appear to be misfits of the type discussed by Evans and Leighton (1989). Further, the large variance suggests that many of those deriving a negative (positive) premium are very unhappy (happy) relative to the mean; taken at face value, the compensating differential required to render those who are one-standard deviation below the mean as satisfied as those at the mean would be crudely equivalent to a tripling of their earnings.

Similarly, despite no significant discount or premium on average, 42% of the self-employed who do not employ others, and 60% of the civil service employees appear to experience a positive satisfaction premium associated with being in their respective jobs. However, the variance on the former is now small, such that even those who might prefer to be formal are "close" in terms of utility to those happy to be there. Although we might expect the "misfits" to be found here, in what the small firm size might suggest is more subsistence-oriented work, we do not find an especially large variance relative to what we find for self-employment with employees, which would suggest this to be the case.

That informal employment is not necessarily considered intrinsically inferior to formal sector wage employment is also attested to by 32% of the informal salaried who, despite suffering an average utility discount, prefer to be so relative to being formal workers. Hence, while the informal salaried may appear to be in an inferior sector on average, the proportion thinking otherwise is quite substantial. Further, the relatively lower variance suggests, again, that compared to either civil employment or self-employment with employees, the informal salaried are not so heterogeneous. The preferences are pretty tightly concentrated – none too thrilled, none too miserable.

Once we hold compensation constant, the conclusion that those employed in the informal sector do not perceive these jobs as inferior strengthens. Two-thirds of the self-employed, both with- and without employees would not prefer formal employment. Individuals in informal salaried employment seem fairly evenly divided on the value of the non remunerative aspects of being formal or working in larger firms; only 47% would prefer to switch to such a job. This may suggest that the quality of formal benefits is not great relative to arrangements in the informal sector.

²¹ The values of σ suggest that roughly 7% of the overall variance is due to unobserved individual effects in the case of RE models without remuneration controls (column 2). This fraction falls with the introduction of the remuneration variables and the random parameters.

²² To see this recall that we can compute the proportion of the population with a positive premium as $100 \times \Phi(\beta/\sigma)$, where Φ is the cumulative standard normal distribution and β and σ is the mean and the standard deviation of the coefficient.

5. Robustness

This section examines several factors that may be driving the distribution of satisfaction premia. We first examine whether or not the results are robust to controlling for individual fixed effects. Subsequently, we investigate whether the results are robust to different measures of wellbeing and whether there are tradeoffs between them.²³

5.1. Controlling for time invariant unobserved individual characteristics

Random effects models are efficient and desirable in the present context so long as there is no correlation between unobserved-individual characteristics, i.e. personality traits, such as being optimistic or pessimistic, and the explanatory variables. Because, to date, there is no stochastic parameter fixed effect random parameter model and, in fact, there are no fixed effect non-stochastic parameter ordered probit models, we employ the closest analogous specification, the fixed effect ordered logit estimator of Ferrer-i Carbonell and Frijters (2004). These estimates may also not be free from bias because of the standard incidental parameter problem of nonlinear estimators when t is small.²⁴ However, with these caveats in mind, if the results obtained with an ordered logit are similar to an ordered probit, and then are also robust to the inclusion of fixed effects in the ordered probit, that gives some measure of confidence that unobserved individual effects are not driving our results.

The fixed effect estimator forces us to exclude individuals whose job satisfaction does not vary over the period over which they are observed, which constitutes roughly a third of our sample.²⁵ This renders the tradeoff between bias and efficiency involved in the choice of moving to a fixed effects model particularly acute in this context. Still, Table 7, which again replicates the model with and without remuneration (columns 4 and 5 from Table 4), suggests that our results are likely to be robust. The ordered logit results while not directly comparable numerically, nonetheless show a virtually identical pattern of relative job desirability to those of the analogous probit. In particular, informal salaried work suffers a discount until we control for earnings at which point it, again, becomes insignificant. Columns 3 and 4 repeat the exercise with the fixed effects estimator. Clearly, all time-invariant characteristics are removed through fixed effects.²⁶ Several important results emerge. First, the premium to self-employment with employees rises substantially relative to the logit and remains strongly significant with and without remuneration included. Second, all other dummies are not significant and in particular, we cannot reject the null that there is no satisfaction discount associated with being informal salaried or premium associated with being employed in the civil sector. Thus, the result that being self-employed and having employees is associated with higher levels of job satisfaction does not appear to be driven by workers' unobserved personal characteristics, for instance, being more optimistic than other labor market participants.²⁷ If anything, our results suggest that workers in all informal jobs are less optimistic. Hence, the fixed effect logit results attest to the overall robustness of the observed pattern of the RERPOP results.

Finally, a Hausman test of the logit RE (not shown) against the logit FE without random parameters and time-invariant characteristics (column 3) yields a value of 23.8 against a critical value from χ^2 with 18 degree of freedom of 28.9 suggesting that we cannot reject that RE estimates are not biased relative to the FE and hence are preferable.

5.2. Life and financial satisfaction

We rerun the specifications that condition on remuneration for two other measures of self-reported wellbeing; life and financial satisfaction. This not only enables us to gauge how robust the results are to using alternative proxies for wellbeing, but also sheds additional light on the quality of different jobs. For instance, a possible explanation for the job satisfaction premia offered by Benz and Frey (2008a) is that while self-employed workers have higher levels of job satisfaction, they may have lower levels of satisfaction in other domains, such as life and financial satisfaction. Tradeoffs between these different dimensions of wellbeing can arise, for instance, when self-employed individuals face more work-family conflicts as a result of their longer working hours (Parasuraman and Simmers, 2001), or because they have higher income fluctuations (Carrington et al., 1996). Blanchflower and Oswald (1998), on the contrary, find that self-employment has a positive effect both on job-satisfaction and general life-satisfaction. Moreover, assessing life and financial satisfaction is of interest in and of itself, since life satisfaction is a good proxy for overall wellbeing. Financial satisfaction provides a narrower measure of utility that

²³ We also assessed whether job characteristics, risk aversion, and autonomy explain our results, but find little evidence that these matter much. See the working paper version of this paper (Falco et al., 2012).

²⁴ See Greene and Hensher (2010a) for a discussion. In the binary logit model, and with $T=2$, Abrevaya (1997) has shown analytically that the full MLE estimate converges to 2β . The Monte Carlo results in Greene (2004) suggest that biases comparable to those in binary choice models also affect fixed effects ordered choice models.

²⁵ To avoid this reduction in sample size, we also replicated our results using a standard fixed-effects model, which does not suffer from this drawback, yet forces us to assume cardinality. Ferrer-i Carbonell and Frijters (2004), however, show that assuming cardinality rather than ordinality has little impact on the results. The results, which are not presented to conserve space, are qualitatively similar to those obtained using the fixed effects ordered logit model.

²⁶ We also remove the height variable, as we expect only very small changes over time, which are most likely predominantly driven by measurement error.

²⁷ Incidentally, note that the fixed effects specification mitigates bias due to systematic underreporting or mis-measurement of earnings of the self-employed.

Table 7

Robustness to inclusion of individual effects: fixed effects logit.

	Ordered logit		Fixed effects	
	(1)	(2)	(3)	(4)
Self-employed, employees	0.466*** (0.139)	0.409*** (0.140)	0.715*** (0.263)	0.694** (0.278)
Self-employed, no employees	–0.070 (0.101)	0.065 (0.105)	0.278 (0.231)	0.318 (0.246)
Informal salaried	–0.242** (0.111)	–0.060 (0.113)	0.214 (0.222)	0.283 (0.225)
Civil	0.154 (0.165)	0.055 (0.167)	–0.035 (0.328)	–0.147 (0.331)
Earnings (log)		0.410*** (0.041)		0.320*** (0.062)
Hours (log)		0.577 (0.506)		1.231 (0.769)
Hours (log) ²		–0.081 (0.078)		–0.177 (0.117)
Tenure (log)		–0.008 (0.039)		0.005 (0.078)
Apprentice		0.195 (0.178)		–0.205 (0.388)
Household assets (log)		0.163*** (0.025)		0.194*** (0.050)
Male	0.018 (0.079)	–0.154* (0.080)		
Age	–0.036 (0.023)	–0.062** (0.023)	–0.304 (0.550)	0.190 (0.572)
Age ² /100	0.043 (0.029)	0.072** (0.029)		
Education	–0.033 (0.025)	–0.011 (0.024)		
Education ² /100	0.408** (0.178)	0.096 (0.175)		
Height (Z-score)	0.062* (0.034)	0.047 (0.035)		
Married	0.130* (0.078)	0.033 (0.078)	0.039 (0.174)	–0.057 (0.178)
Household head	–0.120 (0.076)	–0.067 (0.079)	–0.137 (0.135)	–0.136 (0.143)
Ethnicity dummies	Yes	Yes	No	No
City dummies	Yes	Yes	No	No
Year dummies	Yes	Yes	Yes	Yes
Hausman's statistic				23.8
Observations	3242	3242	2130	2130
Pseudo-R ²	0.029	0.050	0.072	0.103

Note: Estimation by ordered logit and fixed effects logit. The dependent variable is Job satisfaction which is an ordered variable with the following categories: 1. Very Dissatisfied, 2. Dissatisfied, 3. Neither Satisfied Nor Dissatisfied, 4. Satisfied, 5. Very Satisfied. The five labor market states are Self-no employees (those declaring themselves self-employed, but with no employees); Self-with employees (those with employees); Informal salaried (employees in firms of up to 5 workers); Formal salaried (employees in firms over 5 workers); and Civil (civil or public sector workers). Omitted category is Formal salaried. Information on subjective job satisfaction was collected in all waves except the recall wave. The null hypothesis of the Hausman statistic is that Logit FE and RE are consistent, but Logit RE is efficient. Thresholds not reported. Standard errors in parentheses.

* $p < 0.1$.** $p < 0.05$.*** $p < 0.01$.

focuses on only one dimension of job satisfaction, but may capture a broader view of overall family resources as well as an intertemporal view of an individual's wellbeing that is not being captured by current remuneration. For instance, small businesses may take a while to grow to profitability, but may then yield higher earnings than salaried employment over the long run.

Table 8 presents the results using the RERPOP specification. For the purpose of comparability, the sample is restricted to workers for whom information on all measures is available. Since life and financial satisfaction are reported in only 4 waves (as opposed to 6 waves for job satisfaction), the resulting samples are smaller. Column 1 repeats the full specification from Table 5 with the reduced sample. Column 2 presents the results for life satisfaction and column 3 those for financial satisfaction. The results are similar across measures and to the previous findings. This is particularly true for the non-random-parameter controls with the exception of being married and being a household head, which are not significant predictors of job or financial satisfaction conditional on the other variables, but do help predict life satisfaction. By contrast, men have significantly lower life and financial satisfaction than women, but similar job satisfaction, *ceteris paribus*. Education appears

Table 8

Robustness to alternative measures of subjective wellbeing (RERPOP).

	Parameter	Job satisfaction (1)	Life satisfaction (2)	Financial satisfaction (3)
Self-employed, employees	Mean	0.179 [*] (0.107)	0.282 ^{***} (0.103)	0.449 ^{***} (0.102)
	SD	0.708 ^{***} (0.077)	0.463 ^{***} (0.075)	0.661 ^{***} (0.074)
Self-employed, no employees	Mean	−0.003 (0.089)	−0.050 (0.085)	0.237 ^{***} (0.083)
	SD	0.224 ^{**} (0.039)	0.001 (0.042)	0.246 ^{***} (0.040)
Informal salaried	Mean	−0.070 (0.097)	−0.100 (0.094)	0.002 (0.101)
	SD	0.004 (0.063)	0.098 (0.062)	0.009 (0.070)
Civil	Mean	0.054 (0.129)	0.107 (0.125)	0.050 (0.120)
	SD	0.797 ^{***} (0.106)	0.823 ^{***} (0.108)	0.812 ^{***} (0.106)
Earnings (log)	Mean	0.253 ^{***} (0.029)	0.225 ^{***} (0.029)	0.277 ^{***} (0.028)
Hours (log)	Mean	0.539 [*] (0.303)	0.424 (0.310)	0.311 (0.304)
Hours (log) ²	Mean	−0.081 [*] (0.048)	−0.068 (0.049)	−0.047 (0.047)
Tenure (log)	Mean	0.020 (0.032)	−0.014 (0.032)	−0.021 (0.032)
Apprentice	Mean	0.073 (0.154)	0.084 (0.170)	0.221 (0.178)
Household assests (log)	Mean	0.088 ^{***} (0.023)	0.094 ^{***} (0.022)	0.090 ^{***} (0.023)
Male	Mean	−0.042 (0.065)	−0.253 ^{***} (0.064)	−0.208 ^{***} (0.062)
Age	Mean	−0.048 ^{**} (0.019)	−0.066 ^{***} (0.018)	−0.046 ^{**} (0.019)
Age ² /100	Mean	0.055 ^{**} (0.024)	0.077 ^{***} (0.023)	0.055 ^{**} (0.024)
Education	Mean	−0.030 (0.022)	−0.019 (0.023)	−0.028 (0.022)
Education ² /100	Mean	0.215 (0.152)	0.297 (0.159)	0.298 ^{**} (0.146)
Height (Z-score)	Mean	0.019 (0.028)	0.025 (0.028)	0.00001 (0.026)
Married	Mean	0.034 (0.063)	0.198 ^{***} (0.064)	−0.038 (0.062)
Household head	Mean	−0.088 (0.059)	0.003 (0.060)	0.012 (0.058)
σ		0.019 (0.026)	0.204 ^{***} (0.027)	0.029 (0.026)
Ethnicity dummies		Yes	Yes	Yes
City dummies		Yes	Yes	Yes
Year dummies		Yes	Yes	Yes
LL		−2234.983	−2091.045	−2198.836
Finite sample AIC		2.566	2.403	2.525
HQ IC		2.606	2.443	2.565
N		1771	1771	1771
Individuals		1209	1209	1209

Note: Estimation by random effects random parameter ordered probit (RERPOP). The dependent variables are Job, Life and Financial satisfaction which are ordered variables with the following categories: 1. Very Dissatisfied, 2. Dissatisfied, 3. Neither Satisfied nor Dissatisfied 4. Satisfied, 5. Very Satisfied. Sample common across all estimates and is limited by the fact that Life and Financial satisfaction measures were collected only over 4 waves. The five labor market states are Self-no employees (those declaring themselves self-employed, but with no employees); Self-with employees (those with employees); Informal salaried (employees in firms of up to 5 workers); Formal salaried (employees in firms over 5 workers); and Civil (civil or public sector workers). Omitted category is Formal salaried. Parameters for all job types- Self with employees Self-no employees, Informal Salaried and Civil are assumed to follow a normal distribution. Omitted category is Formal employment. Estimates using 100 Halton draws. σ corresponds to the random effect parameter which is estimated assuming a random constant. Finite Sample AIC corresponds to $AIC + 2M(M+1)/(n-M-1)$ and HQ IC corresponds to $(-2 \log L + 2M \log \log n)/n$ where M is the number of parameters in the model. Thresholds not reported. Standard errors in parentheses.

* $p < 0.1$.** $p < 0.05$.*** $p < 0.01$.

uncorrelated with job satisfaction (conditional on income) but is associated with enhanced life and financial satisfaction. Earnings and household assets appear to have virtually the same impact on all three measures.

Looking at the sectoral dummies, we find that self-employment with employees has an even higher positive premium in life and financial satisfaction. Further, even those without employees now enjoy a large and significant financial satisfaction premium relative to formal employment. One possible way of reconciling both findings with the previous ones is to interpret the remuneration variables for both sets of firms as imperfectly capturing future projected earnings.²⁸

Partly as a result of using a reduced sample, the estimated patterns of heterogeneity change somewhat. The null hypothesis of no heterogeneity in satisfaction associated with informal salaried employment is never rejected. By contrast, civil service employment shows a modest rise in heterogeneity in job, life and financial satisfaction relative to the previous exercise. The standard deviation for self-employment with employees is also higher than was the case in the previous exercise both in the job and financial satisfaction specifications, but not in the life satisfaction regression.

Despite the weaker power resulting from the smaller sample size, the results of the analysis of life and financial satisfaction are consistent with those from the analysis of job satisfaction. Self-employment of both types appears more favorable than before. Overall, the self-employed and informal salaried are certainly no less satisfied with their lives and their financial situation, *ceteris paribus*, than workers in the formal sector. Further, there does not appear to be a strong tradeoff between financial and life satisfaction on the one hand, and job satisfaction on the other. Since satisfaction measures are strongly correlated and because work satisfaction has been argued to be one of the most important determinants of life satisfaction (van Praag et al., 2003), these findings should perhaps not come as a surprise.

6. Conclusion

This paper employs mixed (stochastic parameter) ordered probit estimators to characterize the distribution of subjective wellbeing across employment sectors in Ghana, which is broadly representative of sub-Saharan African countries. Self-reported job and life satisfaction measures are useful proxies for wellbeing as they are comprehensive and rely on individuals' own weighting of the importance of various job attributes, thereby mitigating the limitations of objective proxies such as earnings.

The random parameter methodology permits quantification of sectoral satisfaction premia, as well as of the variance of conditional satisfaction across agents within sectors. Hence, it allows us to document heterogeneity in conditional subjective wellbeing that fixed parameter models cannot detect. It thus helps characterize different employment sectors and the nature of informality.

Looking at first moments, our results suggest that being self-employed with employees is by far the most desirable type of employment. By contrast, workers appear indifferent between formal salaried employment, self-employment without employees, and civil service/public sector employment. Only the informal salaried show a discount but this finding is not robust across estimation techniques and disappears when conditioning on income. The non-wage benefits of being formal, surprisingly, appear not to affect utility.

Moreover, the estimates of the variance of satisfaction suggest a high degree of overlap in the distribution of job satisfaction across sectors. Despite the positive average premium accruing to the informal self-employed with employees, the variance around the central tendency is very large and roughly a third of those workers would prefer formal wage employment. Similarly, 42% of the sole proprietors (own account workers who do not employ others) prefer to be self-employed over having a formal sector wage job, even though on average there is no significant premium or discount associated with being in the sector. Conversely, about a third of the informal salaried workers would prefer to remain so over having a wage job in a formal firm, even though the mean premium associated with being informal salaried is negative. In sum, most of the informal self-employed, and a non trivial share of the informal salaried in Ghana show higher satisfaction than formal sector workers. While we find some “misfits” in informal self-employment, and unsettled young people in informal salaried employment, overall, the heterogeneity in self-reported wellbeing does not appear driven by segmentation across sectoral lines.

These results are robust to controlling for compensation, worker fixed effects, and to using alternative proxies for subjective wellbeing. However, examining what drives the enormous heterogeneity in self-reported satisfaction we document and assessing causality are important areas for future research.

References

- Abrevaya, J., 1997. The equivalence of two estimators of the fixed-effects logit model? *Econ. Lett.* 55 (1), 41–43.
- Akerlof, G., Rose, A., Yellen, J., Ball, L., Hall, R., 1988. Job switching and job satisfaction in the US labor market? *Brookings Papers Econ. Activity* 1988 (2), 495–594.

²⁸ In particular, the firms with no employees may be small firms that are still growing, and require long work days. Hence, although the intertemporal financial panorama may appear superior, present job and life satisfaction may not reflect this. Informal salaried work suffers no utility discount with any of the satisfaction variables. This is perhaps surprising since we may imagine that, while health benefits, for example, may not directly affect work satisfaction, they affect the whole family and hence life satisfaction more generally. That we do not find this may suggest that the quality of the formal benefits is not great relative to arrangements in the informal sector.

- Benz, M., Frey, B., 2008a. Being independent is a great thing: subjective evaluations of self-employment and hierarchy? *Economica* 75 (298), 362–383.
- Benz, M., Frey, B.S., 2008b. The value of doing what you like: evidence from the self-employed in 23 countries. *J. Econ. Behav. Organ.* 68 (3–4), 445–455.
- Bhat, C., 2001. Quasi-random maximum simulated likelihood estimation of the mixed multinomial logit model? *Transp. Res. Part B: Methodol.* 35 (7), 677–693.
- Blanchflower, D., 2000. Self-employment in OECD countries? *Labour Econ.* 7 (5), 471–505.
- Blanchflower, D., Oswald, A., 1998. What makes an entrepreneur? *J. Labor Econ.* 16 (1), 26–60.
- Bóo, D., Madrigal, L., Pagés, C., 2010. Part-time work, gender and job satisfaction: evidence from a developing country. *J. Dev. Stud.* 46 (9), 1543–1571.
- Bosch, M., Maloney, W., 2006. Gross Worker Flows in the Presence of Informal Labor Markets: Evidence from Mexico, 1987–2002. Technical Report 3833, Policy Research Working Paper.
- Bosch, M., Maloney, W., 2010. Comparative analysis of labor market dynamics using markov processes: an application to informality? *Labour Econ.* 17 (4), 621–631.
- Carrington, W.J., McCue, K., Pierce, B., 1996. The role of employer–employee interactions in labor market cycles: evidence from the self-employed? *J. Labor Econ.* 14 (4), 571–602.
- Clark, A., 2004. What Makes a Good Job? Evidence from OECD Countries. Technical Report 2004–28, DELTA Working Papers.
- Clark, A., Senik, C., 2010. Who compares to whom? The anatomy of income comparisons in Europe. *Econ. J.* 120 (544), 573–594.
- Clark, A.E., 1997. Job satisfaction and gender: why are women so happy at work? *Labour Econ.* 4 (4), 341–372.
- Cunningham, W.V., Maloney, W.F., 2001. Heterogeneity among Mexico's microenterprises: an application of factor and cluster analysis. *Econ. Dev. Cult. Change* 50 (1), 131–156.
- Evans, D.S., Leighton, L.S., 1989. Some empirical aspects of entrepreneurship. *Am. Econ. Rev.* 79 (3), 519–535.
- Fafchamps, M., Söderbom, M., Benhassine, N., 2009. Wage gaps and job sorting in African manufacturing. *J. Afr. Econ.* 18 (5), 824.
- Falco, P., Kerr, A., Rankin, N., Sandefur, J., Teal, F., 2011. The returns to formality and informality in urban Africa. *Labour Econ.* 18 (S1), S23–S31.
- Falco, P., Maloney, W.F., Rijkers, B., Sarrias, M., 2012. Heterogeneity in Subjective Wellbeing: An Application to Occupational Allocation in Africa. Technical Report 6244, The World Bank, Policy Research Working Paper Series.
- Ferrer-i Carbonell, A., Frijters, P., 2004. How important is methodology for the estimates of the determinants of happiness? *Econ. J.* 114 (497), 641–659.
- Fields, G., 2005. A Guide to Multisector Labor Market Models. Technical Report 0505, The World Bank, Social Protection Discussion Paper Series.
- Freeman, R., 1977. Job Satisfaction as an Economic Variable. Technical Report 225, NBER Working Paper.
- Frey, B., Stutzer, A., 2002. What can economists learn from happiness research? *J. Econ. Lit.* 40 (2), 402–435.
- Funkhouser, E., 1996. The urban informal sector in Central America: household survey evidence? *World Dev.* 24 (11), 1737–1751.
- Gindling, T., Newhouse, D., 2014. Self-employment in the developing world. *World Dev.* 56 (C), 313–331.
- Gong, X., Van Soest, A., 2002. Wage differentials and mobility in the urban labour market: a panel data analysis for Mexico? *Labour Econ.* 9 (4), 513–529.
- Gong, X., Van Soest, A., Villagomez, E., 2004. Mobility in the urban labor market: a panel data analysis for Mexico? *Econ. Dev. Cult. Change* 53 (1), 1–36.
- Greene, W., 2004. The behaviour of the maximum likelihood estimator of limited dependent variable models in the presence of fixed effects? *Econ. J.* 7 (1), 98–119.
- Greene, W., Hensher, D., 2010a. Modeling Ordered Choices: A primer. Cambridge University Press, Cambridge, UK.
- Greene, W., Hensher, D., 2010b. Ordered choices and heterogeneity in attribute processing? *J. Transp. Econ. Policy* 44 (3), 331–364.
- Günther, I., Launov, A., 2006. Competitive and Segmented Informal Labor Markets. Technical Report 2349, IZA Discussion Papers.
- Halton, J., 1960. On the efficiency of certain quasi-random sequences of points in evaluating multi-dimensional integrals? *Numer. Math.* 2 (1), 84–90.
- Hensher, D., Greene, W., 2003. The mixed logit model: the state of practice? *Transportation* 30 (2), 133–176.
- Idson, T., 1990. Establishment size, job satisfaction and the structure of work. *Appl. Econ.* 22 (8), 1007–1018.
- Jutting, C., Laiglesia, J.R.D., et al. (Eds.), 2009. Is Informal Normal?: Towards More and Better Jobs in Developing Countries. OECD Publishing, Paris, France, ISBN 978-92-64-05923-8.
- Kingdon, G., Sandefur, J., Teal, F., 2005. Patterns of Labor Demand in Sub-Saharan Africa. A Review Paper. CSAE, Oxford.
- Livingstone, I., 1991. A reassessment of Kenya's rural and urban informal sector? *World Dev.* 19 (6), 651–670.
- Maloney, W., 1999. Does informality imply segmentation in urban labor markets? Evidence from sectoral transitions in Mexico. *World Bank Econ. Rev.* 13 (2), 275.
- Marcouiller, D., de Castilla, V.R., Woodruff, C., 1995. Formal Measures of the Informal Sector Wage Gap in Mexico, El Salvador, and Peru. Boston College Working Papers in Economics 294.
- Margolis, D.N., 2014. By Choice and by Necessity: Entrepreneurship and Self-Employment in the Developing World. Technical Report 8273, IZA Discussion Papers.
- McKelvey, R., Zavoina, W., 1975. A statistical model for the analysis of ordinal level dependent variables? *J. Math. Sociol.* 4 (1), 103–120.
- Mulinge, M., Mueller, C., 1998. Employee job satisfaction in developing countries: the case of Kenya? *World Dev.* 26 (12), 2181–2199.
- Oswald, A., 1997. Happiness and economic performance? *Econ. J.* 107 (445), 1815–1831.
- Oswald, A., Proto, E., Sgroi, D., 2013. Happiness and Productivity. CAGE Online Working Paper Series 108.
- Pagés, C., Madrigal, L., 2008. Is Informality a Good Measure of Job Quality? Evidence from Job Satisfaction Data. Inter-American Development Bank, Research Department Publications 4603.
- Parasuraman, S., Simmers, C.A., 2001. Type of employment, work-family conflict and well-being: a comparative study. *J. Organ. Behav.* 22 (5), 551–568.
- Perry, G., Maloney, W.F., Arias, Omar, M.A., Saavedra, J., 2007. Informality: Exit and Exclusion. World Bank, Washington D.C.
- Poschke, M., 2013. Entrepreneurs out of necessity: a snapshot? *Appl. Econ. Lett.* 20 (7), 658–663.
- Pradhan, M., van Soest, A., 1995. Formal and informal sector employment in urban areas of Bolivia? *Labour Econ.* 2 (3), 275–297.
- Pradhan, M., van Soest, A., 1997. Household labor supply in urban areas of Bolivia? *Rev. Econ. Stat.* 79 (2), 300–310.
- Pratap, S., Quintin, E., 2006. Are labor markets segmented in developing countries? A semiparametric approach. *Eur. Econ. Rev.* 50 (7), 1817–1841.
- Ravallion, M., Lokshin, M., 2002. Self-rated economic welfare in Russia? *Eur. Econ. Rev.* 46 (8), 1453–1473.
- Revelt, D., Train, K., 1998. Mixed logit with repeated choices: households' choices of appliance efficiency level? *Rev. Econ. Stat.* 80 (4), 647–657.
- Söderbom, M., Teal, F., Wambugu, A., Kahyarara, G., 2006. The dynamics of returns to education in Kenyan and Tanzanian manufacturing? *Oxf. Bull. Econ. Stat.* 68 (3), 261–288.
- Train, K., 2003. Discrete Choice Methods with Simulation. Cambridge University Press, Cambridge, UK.
- van Praag, B.M.S., Frijters, P., Ferrer-i Carbonell, A., 2003. The anatomy of subjective well-being? *J. Econ. Behav. Organ.* 51 (1), 29–49.
- Wright, T., Staw, B., 1999. Affect and favorable work outcomes: two longitudinal tests of the happy-productive worker thesis? *J. Organ. Behav.* 20 (1), 1–23.