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ABSTRACT

Heterogeneity in Subjective Wellbeing: An Application to Occupational Allocation in Africa*

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 and offers insights into the functioning of developing country labor markets. We find little evidence for the overall inferiority of the small firm informal sector: there is not a robust average satisfaction premium for formal work vis a vis self-employment or informal salaried work and, in fact, informal firm owners who employ others are on average significantly happier than formal workers. 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 both relatively happy and disgruntled workers. Concretely, roughly 67%, 50%, 40% and 59% prefer being a small firm employer, sole proprietor, informal salaried, and civic worker respectively, to formal work. Hence, there is a high degree of overlap in the distribution of satisfaction across sectors. The results are robust to the inclusion of fixed effects, and using alternate measures of satisfaction. Job characteristics, self-perceived autonomy and experimentally elicited measures of attitudes toward risk do not appear to explain these distributional patterns.

JEL Classification: C35, J2, J3, J41, L26, I32, 017

Keywords: subjective wellbeing, mixed ordered probit, self-employment, informality, developing country labor markets, Africa

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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 (e.g Freeman, 1978; Akerlof et al., 1988), productivity (Oswald et al., 2008) 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, 2010a),[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

[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 percieved poverty

[2] "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." Evans and Leighton (1989) p. 532

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 the 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 – broadly termed the informal sector – have been intensely debated for decades. While the advanced country literature stresses the desirability of independence and being one's own boss that self-employment and the small firm sector offers, 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.[3] However, demonstrating segmentation requires showing that, at the margin, utility is not equated across sectors and the conditional wage premia commonly estimated as proxies may instead reflect preference heterogeneity and compensating differentials (e.g. for risk, independence, taxes avoided, the perceived value of benefits, or training). Hence, as with the advanced country literature on self-employment, establishing the distribution of subjective measures of satisfaction offers more potential for characterizing the informal sector.

[3]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., 2010); many of the self-employed earn more than comparable individuals in wage jobs. Moreover, Launov and Gunther (2012) 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 low middle income countries more generally.[4] The GUHPS permits us to study job satisfaction across sectors, potentially controlling for unobserved heterogeneity, and thereby to better characterize developing country labor markets and assess how well the developed country literature generalizes to them. Using conventional ordered categorical data models, we first test for the existence of self-employment and small firm satisfaction premia. Since studies of job satisfaction in developing countries are scarce (see Clark and Senik, 2010a, for a review of the literature) it is unknown whether this finding translates to poor countries where such jobs often constitute the vast majority of employment, sometimes accounting for 70-80% of the labor force (see Kingdon et al., 2005).[5] The few studies of job satisfaction in developing countries that we are aware of 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; Pagés et al., 2008). In particular, we test whether the relative satisfaction premium for self-employment and informal salaried employment are more consistent with the competitive view emerging from the OECD literature, or a dualistic conceptualization of the informal sector: whether there is a positive satisfaction premium associated with formal jobs that would signal that markets are not competitive, as well as identifying which characteristics may be associated with it.

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

[4]Ghana's 2010 GNI/capita of $US 1,230 is roughly the average for sub-Saharan Africa ($US 1,176). Though reliable representative labor market data are fairly sparse, our estimates of the share of self-employment is broadly similar to that for sub-Saharan Africa.

[5]The ILO (2002) estimates that informal sector self-employment alone accounts for 53% of all non-agricultural employment in Sub-Saharan Africa and about a third of all non-agricultural employment in North Africa.

with being in a particular sector, but also to assess whether, and to what extent, conditional job satisfaction varies within those sectors. We document significant heterogeneity in job satisfaction across sectors and are able to quantify what fraction of workers are voluntary or involuntary in each sector, as well as 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 multisector 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 and examine a number of previously underexplored explanations for the distribution of job satisfaction across sectors. First, we assess the robustness of our results using the fixed effects 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)). Third, as autonomy has been argued to be an important reason for the higher job satisfaction levels reported by the self-employed in a wide variety of countries (Benz and Frey, 2008a), we examine the importance of a feeling of "control" in driving the observed distribution. Fourth, we assess the robustness of our results to controlling for a richer set of job (as opposed to worker) characteristics. Finally, using an experimentally elicited measure of risk aversion, we examine to what extent differences in satisfaction across jobs are the result of differences in workers' risk tolerance focusing in particular on the question as to whether less risk-averse individuals enjoy self-employment more.[6]

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

[6]Note that self-employment need not be more risky; for example, wage employees may face a substantial risk of being fired.

presents estimates using our mixed ordered estimators. Section 6 presents robustness checks and explores a number of salient explanations for the results presented in sections 4 and 5. 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 the objective of the estimation is 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. However, if there is heterogeneity, then 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.

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 $\boldsymbol{\beta}_i \sim f(\boldsymbol{\beta}, \boldsymbol{\Omega})$ and

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

$$\boldsymbol{\beta}_i = \boldsymbol{\beta} + \boldsymbol{W}\boldsymbol{\upsilon}_i \tag{1}$$

where $\boldsymbol{W}$ is a diagonal matrix whose elements are standard deviations[8], and $\boldsymbol{\upsilon}_i \sim N(0,1)$.

As Hensher and Greene (2003) note, the choice of the underlying parameter distribution must be made a priori. Though we use the normal distribution here, other ones such as the log normal, uniform, and triangular distribution have also been employed (see Hensher and Greene, 2003; Train, 2003). Though the log normal is mathematically more convenient and underlies the more common mixed logit, we use the normal for two reasons. First, it permits estimation of coefficients of both signs which is essential for our analysis of the relative desireability of different sectors (Revelt and Train, 1998). Second, as Greene and Hensher (2010a) notes the imposition of a mixture of a normal distribution on the random effect and then a log normal distribution on the parameters seems somewhat awkward. Turning to the other options, we have no reason to believe that, for instance, preferences, for example, are uniformly distributed. Similarly, although the triangular distribution is commonly used when the interest is the willingness to pay between different attributes, this is not our focus and its functional form would impose unrealistic assumptions about the tails of the distribution.

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

$$\begin{aligned} y_{it}^* &= \boldsymbol{\beta}_i'\boldsymbol{x}_{it} + \boldsymbol{\delta}'\boldsymbol{z}_{it} + \boldsymbol{\mu}_i + \epsilon_{it} \qquad i = 1, ..., N \;\; t = 1, ..., T_i \\ &= (\boldsymbol{\beta} + \boldsymbol{W}\boldsymbol{\upsilon}_i)'\boldsymbol{x}_{it} + \boldsymbol{\delta}'\boldsymbol{z}_{it} + \boldsymbol{\mu}_i + \epsilon_{it} \end{aligned} \tag{2}$$

where $\boldsymbol{x}_{it}$ is a vector of covariates related to job status, $\boldsymbol{z}_{it}$ is a vector of covariates related to other controls whose distribution is not of interest; $\boldsymbol{\beta}_i$ and $\boldsymbol{\delta}$ both contain unknown marginal utilities. The first captures the heterogeneity of the population with

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

respect to satisfaction with each job type and $\boldsymbol{\mu}_i$ represents an individual-specific random effect. Note that this specifications 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:

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

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 $\kappa_0, ..., \kappa_J$. In order to ensure well-defined intervals, we need to assume ascending thresholds such that $\kappa_0 <, ..., < \kappa_J$. 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}. The probability of the observed outcome sequence J for the person i is therefore:

$$\Pr[y_{it} = j_T | \boldsymbol{x}_{it}, \boldsymbol{z}_{it}, \boldsymbol{\upsilon}_i] = \prod_{t=1}^{T_i} F(\kappa_J - (\boldsymbol{\beta} + \boldsymbol{W}\boldsymbol{\upsilon}_i)'\boldsymbol{x}_{it} - \boldsymbol{\delta}'\boldsymbol{z}_{it}) - F(\kappa_{J-1} - (\boldsymbol{\beta} + \boldsymbol{W}\boldsymbol{\upsilon}_i)'\boldsymbol{x}_{it} - \boldsymbol{\delta}'\boldsymbol{z}_{it}) \tag{3}$$

where $\boldsymbol{x}_{it}$ contains a column of ones; $F(\cdot)$ is the distribution of the error terms in which $F(\cdot) = \Phi(\cdot)$ if the error terms follow a standard normal distribution.[9] Equation 3 contains the unobserved random terms $\boldsymbol{\upsilon}_i$ which must be integrated out for estimation:

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

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:

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

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

where $\boldsymbol{\upsilon}_{ir}$ is the rth random draw for each individual. We use Halton draws because the literature suggests that these are superior to standard draws in this context.[10] Clearly, eliminating the stochastic component of $\boldsymbol{\beta}$ yields a standard ordered 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.

Though we also present fixed effects estimates following Ferrer-i Carbonell and Frijters (2004) for reference (See Annex A), in general this estimator faces two problems in the present as in other non linear contexts (See Greene and Hensher (2010a) for a more exhaustive literature review). First, maximum likelihood estimation generates often severe bias when T is small (the incidental parameter problem). In the binary logit model, and with $T = 2$, Abrevaya (1997) has shown analytically that the full MLE estimate converges to $2\boldsymbol{\beta}$. The Monte Carlo results in Greene (2004) suggest that biases comparable to those in binary choice models also jaundice fixed effects ordered choice models. Second, no appropriate procedure has been proposed in order to estimate a fixed effect ordered choice model with random parameters.

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 labor force participants (ages 15 to 60) in the four largest urban centers

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

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 age and gender 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 enterprises profits. Thus, earnings for self-employed workers reflect both the returns to capital and the returns to labor. In addition to these earnings measures, and 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.

Dimensions of Job Satisfaction: The survey also contains variables that help us shed light on

the drivers of differences in job satisfaction for select subsamples. To start with, for a subset of respondents we have information on job characteristics. Second, individuals were asked to rate how much control they considered they had over their lives, varying from *"1. No control", "2 some control", "3 a great deal of control"* to *"4 complete control"*. This variable may capture the degree that self-employment is associated with greater empowerment, for example by providing more independence.

Third, the survey also generated an experimentally solicited measure of risk aversion through a series of lottery games played with a subset of the sample(see Falco et al. (2010)). A representative subset of 288 respondents from the UPS was invited to participate to a number of workshops where they were presented with a series of 21 lottery games. In each game participants were asked to choose between two alternative lotteries. Each lottery took the shape of an opaque bag containing a number of coloured marbles. To each colour was attached a money prize and each respondent was asked to choose from which of the two bags he would prefer to pick a random marble. At the beginning of the task each participant was told that, once they had made their 21 choices, one would be picked at random and acted out, i.e., they could pick a marble from the bag they chose in that case and would be paid the corresponding winnings. The winnings of the gamble ranged from 10,000 to 110,000 CEDIs, with average winnings calibrated just above 30,000 CEDIs. This sum was estimated to be larger than the average daily earnings of a worker in the sample and therefore the stakes were high enough to elicit participants' true risk-preferences. From this, an estimate of each of the participants' individual Coefficients of Relative Risk Aversion was retrieved.[11]

3.2 Employment States

For the purpose of this analysis, we distinguish between five paid employment states among workers who respond to the standard question about whether they have done any work for pay, profit or gain for the last seven days, even for one hour.[12]

[11] For further details on how this measure was constructed, the sampling design and the definition of other key variables (see CSAE, 2008; Falco, 2010; Falco et al., 2010).

[12] We do not have a variable for whether a worker is covered by the sparse social protection programs that exist, hence we base our categorizations of formality on firm size.

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 mode 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. Typically, firms in the first category employ one other person, though the average number of workers employed is three. Neither group is obligated to contribute to national social protection programs, and they are not automatically covered. Hence, we consider them informal.

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/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 is that public sector jobs are the most desirable jobs. We test whether this is true.

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 confirms the stylized fact for Africa that informal jobs account for the bulk of urban employment. In our sample, formal salaried employment accounts for only 16% of all paid employment and civil 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.

Demographically, women are much more likely to be self-employed, whereas formal and civil employment are disproportionately male and informal salaried work is slightly more male. Average years of education increases moving from self-employed without employees, to self-employed with employees, to informal salaried, to formal private and civil employment. Average age and marital status suggest important differences in where across the life cycle workers are found, with the informal salaried being younger and seemingly less-established, on average, at the beginning of their professional life cycle, while the self-employed are closer to the end.[13]

Unconditional earnings are highest for those employed in the civil sector. Somewhat surprisingly, self-employment with employees is next followed by formal salaried and then self-employment with no employees. Informal salaried employment holds up the bottom of the ranking. These would clearly be more informative were they conditional, although even then, we would not be compensating for unobserved job characteristics such as degree of independence (autonomy), risk, workplace conditions, future earnings prospects, and the like.

Table 2 presents transition matrices for movements across sectors over one year. These

[13]The informal salaried are youngest at an average age of 31 and the formal salaried are two older at 33. The self-employed without employees are 37 years old on average; the self-employed with employees are approximately two years older on average with a mean age of 39, which is just above the average age of the civil employed which is 38. Only 31% of informal salaried workers are married compared to 39% for the formal salaried, 57% for self without employees and 68% for self-employed with employees. The highest rate of apprenticeship is found among the informal salaried. Small numbers of apprenticeships are also seen among the self-employed (this is possible if the primary job is self-employment but the workers is also engaged in an apprenticeship elsewhere) These patterns are remarkably similar to those found for Argentina, Brazil and Mexico (Bosch and Maloney, 2010)

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. Second, to the degree that turnover is a measure of attachment to a sector (as opposed to rates of firing), formal salaried, civil employment and self-employment show a comparatively high percentage of stayers, (low rate of turnover) at 63%, 69%, and 66% respectively. Informal salaried employment, on the other hand, has the highest rate of turnover; the proportion of stayers is only 45% implying that over half of the sector leaves to other sectors in a year. This, and the demographic patterns noted above, are consistent with it being a sector of entry of relatively young people who are shopping around for their next (superior) employment. Further insights can be gleaned from studying the patterns of mobilility among sectors although, as with the conditional wage comparisons discussed earlier, they cannot offer robust conclusions about the relative desireability of the various sectors.[14]

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, relative to other regions, Ghanaian workers are somewhat less satisfied with their jobs. Using the more homogeneous group of formal salaried workers as the comparator, Ghana yields a value of 3.33. To put this into perspective, consider that a rudimentary rescaling of the seven point scale used by Benz and Frey (2008b) into a comparable five point scale yields

[14]For instance, consistent with the age patterns discussed above, informal salaried workers have relatively high rates of transition to formal employment (15%) destination sector, and to self-employment (22%). Given the diminutive size of the formal sector compared to self-employment (13% of the labor force compared to 43% with roughly equal levels of turnover), this does suggest the informal salaried do have a relative high predisposition towards formal employment. The overall rapid turnover and propensity to move into formal work may suggest a classic queuing story with informal salaried employment being a less desirable holding pattern for formal employment. That said, the high level of reverse flows from formality into informality suggests that the joint market may be behaving more competitively, and utility at the margin potentially equated for many workers. By contrast, the self-employed show relatively little mobility into formal salaried work or civil work and vice versa. Two hypotheses suggest themselves in this case. First, that there is a high degree of segmentation between the self-employed and formal salaried markets, perhaps serving as a retirement ground for older dismissed formal sector workers. Alternatively, it may be that self-employment is the long run destination of workers once they have accumulated sufficient human and financial capital. In the first case, the sector is likely to show lower levels of welfare. In the second they could be higher. See (Bosch and Maloney, 2010) for a discussion of inference based on transition matrices and comparable exercises for Latin America.

3.72 for advanced European countries, 3.58 for the former Eastern European countries, and 3.80 for the US. These differentials in average wellbeing across sectors may partly reflect the long-established finding that life satisfaction increases more generally with income (see Clark and Senik (2010b) for a recent review). However, other factors are likely to be important as well, as is suggested by the greater average satisfaction of workers in Bangladesh (3.69, $US 700) which tend to be poorer.[15]

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 it is worthwhile noting that the self-employed who employ other have marginally higher levels of average life and financial satisfaction than public sector employees, and that the self-employed without employees are on average more satisfied with their financial situation than the formal salaried.

Clearly, it is desirable to both more rigorously model the discrete nature of the subjective responses and to condition on individual characterstics. In the next section, we begin with the commmon fixed parameter ordered probit to provide baseline results. We then employ the random parameter ordered probit estimations to examine the distribution of preferences around the mean tendencies.

[15] A rudimentary rescaling of findings from Blanchflower (2000) gives an average value of 3.88 for the OECD.

4 Estimation

4.1 Fixed Parameter Ordered Probit

Table 3 presents our baseline estimates of job satisfaction using conventional fixed parameter ordered probit models. In column 1, only dummies for job type 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. Surprisingly, self-employed individuals with employees report the highest levels of job satisfaction.[16]

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 percieved 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) generates a positive and significant sign on earnings, and eliminates the negative coefficient on informal salaried employment. This

[16] Controlling for location and year renders the dummy on working in the civil sector insignificant, suggesting that location matters

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. Note that the average utility premium associated with being a small firm owner who employs other is large, especially when compared to the coefficient associated with earnings; in monetary terms, the satisfaction premium is roughly equivalent to a doubling of earnings. These results are robust to the third block of variables (column 3), notably tenure,[17] whether or not the individual is currently an apprentice, and household assets. Household wealth is positively correlated with job satisfaction and diminishes the impact of earnings only slightly. Being an apprentice enters positively but is not remotely statistically significant.

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 do suggest that being better educated, older,[18] 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. 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 effect disappears suggesting that its channel of influence is through earnings. By contrast, the gender dummy which was insignificant

[17] 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.

[18] The quadratic term quickly swamps the free standing term leaving the minimum value at .4 years of age and the joint impact on job satisfaction positive after age 1.

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 conditioning variables seem important to the relative ranking of sectors only for informal salaried work, with the other significant premium on self-employment with employees remaining affected relatively little. The discount on informal salaried work suggests that differences in job satisfaction across sectors are predominantly driven by differences in earnings, rather than differences in workers' observable characteristics, since the sector premia are much more sensitive to inclusion of the latter than the former: workers in this sector appear to be earning, on average, less than is the norm conditional on human capital. This would be consistent with the findings from the summary statistics that suggest that 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 coeffients on job sectors in the previous results 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 particular sectors. The Mixed Ordered Probit expicitly allows for such heterogeneity by estimating the variance of the parameters around the central tendency. Table 4 re-estimates the two most informative 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 1,4) that allows for random parameters (labeled "RPOP" model in the table). Subsequently, (in Columns 2,5) 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 percent 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 just 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 .76 followed by civil employment at .75, informal salaried at .51 and self-employment with no employees at .46. Self-employment with employees offers higher highs, but also potentially lower lows than other sectors. Somewhat counterintuitively, while we might expect this to be more the case in self-employment than in salaried work, this does not appear to be the case since the satisfaction premium associated with civil sector salaried employment has an almost equivalent variance.

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.

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; the average premium associated with being self-employed and employing others is consistently postive and statistically significant, while the premium associated with being informal salaried is negative and statistically significant at the 10% level, unless remuneration is conditioned on.[19]

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. Again, 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. What remains in column 3 and column 6 is the heterogeneity that is particular to each individual sector, the latter, again, conditioning on renumeration. But, as found previously, 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 surprisingly 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 help facilitate interpretation of these results, Figure 1 plots the kernel estimates of the distributions of each sector parameter. Centering the distribution on the estimated conditional mean sectoral premium, Table 5 then calculates the share of the sector for whom satisfaction relative to the formal sector is greater than zero.[20] The results attest to the

[19]The values of σ suggest that roughly 7 percent 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

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

importance of studying the heterogeneity underlying the central tendency. For instance, although our parameter estimates indicate that self-employed individuals 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. That is, 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 civil sector 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 actually do not find an especially large variance relative to what we find for self-employment with employees, that would suggest this to be the case. Combining the two categories (see Annex 1) the standard deviation is statistically significant and almost double that of the self-employed with no employees value and yielding a roughly 60% - 40% split on those more or less happy being self-employed when we do not control for compensation. The big driver of the variance is the relatively smaller, but much more heterogenous employer sector.

That informal employment is not necessarily considered inferior to formal sector wage employment is also attested to by the fact that 32% of the informal salaried, 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 (that is, they do not especially miss the non-remunerative aspects of formality) strengthens. Two-thirds of the self-employed, both with- and without employees would not prefer formal employment.[21] 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.

Taken together, we find that, on average, self-employment with employees enjoys a persistent premium. The informal salaried appear less satisfied than the formal salaried, unless we control for incomes in which case the conditional job satisfaction differential becomes statistically insignificant. Self-employment without employees and civil employment are on average valued equally to formal salaried work. However, we find very strongly significant evidence for heterogeneity within each sector that undermine statements about the relative desireability of each sector based on mean differentials alone. In every sector we find substantial subpopulations that would (not) prefer formal employment. Further, there is also substantial heterogeneity in the degree of heterogeneity across sectors. In some, for instance self-employed with employees, individuals with radically different levels of relative satisfaction coexist within the sector. For the informal salaried, there is far less diversity of opinion about the merits of the sector.

5 Robustness: Fixed Effects, Alternate Measures of Wellbeing, and Attrition

This section examines several factors that may be driving the distribution of satisfaction

[21] Pooling these two groups, as is done in the appendix, further strengthens this conclusion, as only 17% of the self-employed would prefer to be formal wage workers

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 may be tradeoffs between them. Third, we examine the potential importance of survival bias (attrition).

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. Though our stochastic parameter model assumes an underlying normal distribution, to date, there is no fixed effects probit estimator. As an indirect test of the robustness of the overall patterns we identified in the previous section, we compare our results with those from an ordered logit and then a fixed effects ordered logit model proposed by Ferrer-i Carbonell and Frijters (2004). If the results are similar with the ordered logit to our ordered probit, and then are also robust to the inclusion of fixed effects, that gives some measure of confidence that unobserved individual effects are not driving our results. The fixed effect estimator clearly 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.[22] This renders the tradeoff between bias and efficiency involved in the choice of moving to a fixed effects model particularly acute in this context.

The results are presented in Table 6, which again replicates the model with and without remuneration (columns 4 and 5 from Table 3. The ordered logit results while not directly comparable numerically, nonetheless show a virtually identical pattern of relative job desireability 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-

[22] 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.

invariant characteristics are removed through fixed effects.[23] 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 associted 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.[24] 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.

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. While allowing us to to gauge how broadly robust the results are to using alternative proxies for wellbeing, clearly the responses should differ somewhat and thereby shed additional light on the quality of the individual 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). 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 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

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

[24] Incidentally, note that the fixed effects specification mitigates bias due to systematic underreporting or mismeasurement of earnings of the self-employed.

captured by current remuneration. For instance, small businesses may take a while to grow to profitability, but may then yeild higher earnings than salaried employment over the long run.

Table 7 presents the results using the RERPOP specification. For the purpose of comparability, the sample is restricted to workers for whom information on all measures was available. Since life and financial satisfaction are reported in only 4 waves (as opposed to 6 waves for job satisfaction), the resulting samples are both smaller and have a shorter timespan. Column 1 repeats the full specification from table 4 with the reduced sample. Column 2 present the results for life satisfaction and column 3 financial satisfaction. The results remain remarkably similar across measures and to the previous findings. This is particularly true for the non-random 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 controls, 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 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 signficant financial satisfaction premium relative to formal employment. One possible way of reconciling both findings with those previous is to see the remuneration variables for both sets of firms as imperfectly capturing future projected earnings.[25]

Partly as a result of using a reduced sample, the estimated patterns of heterogeneity change

[25]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 variable. 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.

somewhat. Informal salaried workers now show no significant standard deviation in any specification. By contrast, civil 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 higherthan was the case in the previous exercise both in the job and financial satisfaction specifications, but not in the life satisfaction regression. This appears to be due to the fact that the random effect is only significant in the life satisfaction case and we know from table 4 that this reduces, by roughly the difference observed here, the estimated variance. The same phenomenon is seen for the self-employed with no employees which lose the significance of the standard deviation in the case of life satisfaction.

Despite the weaker power resulting from the smaller sample size, the results with the life and financial satisfaction variables broadly confirm the findings with the larger sample using just 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 those 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 the most important determinant of life satisfaction (**?**), these findings should perhaps not come as a surprise.

5.3 Survivor/Attrition Bias

Finally, we address the potential biases due to attrition from the panel. Each year approximately 30% of the respondents drop out, but many of these drop-outs are temporary, as a significant share of the dropouts re-appears in later waves.[26] Moreover the attrition does not seem systemic, but instead appears driven largely by difficulties associated with tracking people as addresses were not recorded and the initial waves of the survey did not use GIS mapped data. Simple probit models (not presented here to conserve space) suggest that location and survey wave are the strongest predictors of attrition; age, education and employment status have little explanatory power. Hence we would expect little systematic

[26] Of the 1164 individuals interviewed in 2004, 622 were still in the sample in 2010.

impact, especially, on the employment dummies.

Ideally, we would explicitly model attrition. However, the estimation of the RERPOP models is already highly computationally demanding and we therefore follow Dunne et al. (1989) and compare the results obtained using a sample containing observations on only those individuals whose job satisfaction was observed in all waves after they appeared in the data for the first time, the so-called "long-run survivors', with the results obtained using the entire sample'. Comparison of the two sets of results is informative about the size of survivor bias, as estimates obtained for the former sample suffer from maximum survivor bias. The results for the subsample of long-run survivors are presented in Table 8 and are very similar to those obtained for the full sample despite the expected loss in precision arising from losing three-quarters of the sample. Most importantly, though now less significant, the coefficients associated with being self-employed and employing others is similar in RERPOP to those found in tables 3 and 4.[27] Overall, the remarkable consistency across the significant coefficients suggests that attrition effects are not large enough to drive the results.

6 Behind the Distribution of the Satisfaction Premium

The previous exercises have demonstrated that remuneration cannot explain either the average premia associated with various sectors nor the heterogeneity observed around them. In this section we explore the explanatory power of three variables: sector and occupation, self-perceived control, and risk aversion. Because these variables are not available for all individuals, for each, we present the full model (including remuneration to soak up that influence) for the restricted sample, and then add the potential explanatory variable. Table 9 reports the results for each (set of) control(s).

[27]The OP estimate was .27 and is now .24; the RERPOP estimate was .23 and is now .25. Though the standard deviation is now only significant for civil employment, here again the difference in estimate is relatively small, rising from .45 in the full sample to .60 here. The other controls that enter significantly are also within the same range. Earnings were .23 before and are now .16; household assets were .07 and are now .09.

6.1 Autonomy

Self-employment is often associated with greater independence. To assess whether the higher levels of job satisfaction and the distribution associated with being self-employed and employing workers stem from greater autonomy, individual's self-perceived control is included. Again, sample size affects the precision of the panel estimates, in this case eliminating the signficance of the random effect. However, the "control" variable has virtually no impact on either the mean utility premium or the standard deviation in either self- employment category. This suggests that differences in autonomy are not the explanation for the observed satisfaction premia or its variance.

6.2 Job Characteristics

We examine how three job characteristics may affect the observed premia. First, for wage workers we add dummies indicating whether or not the individual in question was engaging in manual labor and working in the manufacturing sector[28] while for the self-employed we include a dummy for being engaged in trading. Columns 3 and 4 present the results. Note that sample selection effects again affect the precision of the estimates. Only occupation has explanatory power,[29] and its inclusion appears to raise the premium for self- employment with employees. The other dummmies are not significant and there is virtually no change in the significant standard deviation variables for either self-employment sector of civil employment, suggesting that differences in job characteristics are not a major determinant of the observed preference heterogeneity.

6.3 Risk Aversion

Third, we assess the possibility that the distribution of job satisfaction results from the distribution of risk preferences, which have been demonstrated to be a predictor of sector choice (Falco et al., 2010), using an experimentally solicited measure of risk aversion. Since

[28] Our survey identifies whether wage workers are manual laborers, managers, professions or clerical workers - yet there is not sufficient variation in the latter three groups, which is why we pool them to construct a single indicator.

[29] For example, workers engaging in manual labor have lower significantly lower levels of job satisfaction than workers who do not. This effect loses significance when fixed effects are controlled for, yet the coefficient estimate remains positive.

these data are collected for only a very small number of observations, the degrees of freedom are relatively few. Column 5 and 6 of Table 9 show all of the sectoral dummies to be insignficant. However, the standard deviations are significant for self-employment with no employees and civil employment. The risk aversion variable reduces these in only the slightest degree suggesting that, for our small sample, it is not the source of heterogeneity.[30] Thus, while our sample is very small and our risk-aversion measure crude, we tentatively conclude that differences in risk aversion are not driving differences in job satisfaction. However, since our estimates are imprecise further research is necessary to validate this inference.

7 Conclusion

This paper employs mixed (stochastic parameter) ordered probit estimators to characterize the distribution of subjective wellbeing across employment sectors for Ghana, which is broadly representative of sub-Saharan African countries. The extraordinarily detailed Ghana Urban Household Panel Survey offers unusual insight into developing country labor markets. The self-reported job and life satisfaction measures it collects 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 how conditional satisfaction varies across agents within sectors, thereby allowing us to document heterogeneity in conditional subjective wellbeing that fixed parameter models cannot detect. They are thus a useful tool in characterizing different employment sectors, and offer important insight into the debate over the functioning of developing country labor markets in general and, the role of the informal sector particular. Analogous to the debate over self-employment in the advanced countries, understanding whether (and to what extent) the latter is, indeed, the inferior part of a segmented labor market, or offers superior employment opportunities for those employed in it requires quantification of the

[30] In an attempt to regain some power, we also ran static specifications (fixed parameter-not shown to conserve space but available upon request). To test the hypothesis that risk-averse individuals will be less happy in self-employment where earnings are arguably more volatile, and happier in wage employment, which is arguably less risky, we interact sector dummies with our experimentally elicited measure of risk aversion. The resulting interactions were neither individually nor jointly significant, yet the pattern of satisfaction premia was robust to their inclusion.

utility workers derive from being in particular sectors on average and, we argue, also its distribution across agents in those sectors.

Looking at first moments, our results suggest that, in fact, 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 employment. Only the informal salaried show a discount but this finding is not robust across estimation techniques and dissapears 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 average premium to informal self-employed with employees, the variance around the central tendency is very large and roughly a third would prefer formal wage employment. Similarly, 42% of the sole proprietors 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 would prefer to be 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, occupational characteristics and using alternative proxies for subjective wellbeing. However, examining what drives the enormous heterogeneity in self-reported satisfaction we document remains a challenge. Our exploratory foray into this important area for future research suggests that the heterogeneity is not driven by a desire for empowerment, differences in occupational characteristics, attitudes towards risk or tradeoffs between different dimensions of wellbeing.

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A Fixed Effect Model in Ordered Choice Models

Several proposals for bias reduction estimators in the binary choice model have been made (Winkelmann and Winkelmann, 1998; Das and Van Soest, 1999; Boes and Winkelmann, 2006). In this paper, we use the approach proposed by Ferrer-i Carbonell and Frijters (2004) which is a modified version of the model proposed by Winkelmann and Winkelmann (1998). In this model:

$$\begin{aligned} y^*_{it} &= \alpha_i + \boldsymbol{\beta}'\boldsymbol{x}_{it} + \boldsymbol{\delta}'\boldsymbol{z}_{it} + \epsilon_{it} \\ y_{it} &= j \quad \text{if} \quad \kappa_{j-1,i} < y^*_{it} \leq \kappa_{j,i} \quad j = 1, ..., J, t = 1, ..., T_i \end{aligned} \tag{6}$$

The ordered logit form is assumed. Therefore, the probability for individual i is:

$$\Pr[\nu_{it} = 1 | \boldsymbol{x}_i, \boldsymbol{z}_i] = \Lambda(\lambda_i + \boldsymbol{\beta}'\boldsymbol{x}_{it} + \boldsymbol{\delta}'\boldsymbol{z}_{it}) \tag{7}$$

where ν_{it} is defined with respect to an individual specific j^*_i:

$$\nu_{it} = 1 \quad \text{if} \quad y_{it} > j^*_i \quad \text{and 0 otherwise}$$

The resulting contribution to the likelihood for individual i is:

$$\begin{aligned} \Pr\left[y_{i1} > j^*_i, ..., y_{i,T_i} > j^*_i 1 | \boldsymbol{x}_{i1}, ..., \boldsymbol{x}_{i,T_i}, \boldsymbol{z}_{i1}, ..., \boldsymbol{z}_{i,T_i}, \sum_{t=1}^{T_i} \nu_{it} = c_i \right] = \\ = \frac{\exp\left(\sum_{t=1}^{T_i} \nu_{it} (\boldsymbol{\beta}'\boldsymbol{x}_{it} + \boldsymbol{\delta}'\boldsymbol{z}_{it}) \right)}{\sum_{(\nu_1, ..., \nu_{T_i}) \in S(j^*_i, c_i)} \exp\left(\sum_{t=1}^{T_i} \nu_i (\boldsymbol{\beta}'\boldsymbol{x}_{it} + \boldsymbol{\delta}'\boldsymbol{z}_{it}) \right)} \end{aligned} \tag{8}$$

where $c_i = \sum_t \nu_{it}$ is the number of times y_{it} is greater than the chosen threshold. The threshold j^*_i is chosen so that c_i is not equal to 0 or T_i. $S(j^*_i, c_i)$ is the set of all possible vectors, $(\nu_1, \nu_2, ..., \nu_{T_i})$, whose elements are all zero or one and sum to c_i; that is, the set of vectors corresponding to sets of outcomes y_{it} such that c_i of them are greater than j^*_i.

B Tables

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 manutal 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	399		1520		523		510		264	

Note: The GUHPS covers labor force participants ages 15 to 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

Table 2: One Year Transitions across Employment States

	Current State						
Initial State	Self-employed employess	Self-employed no employees	Salaried Formal	Salaried Informal	Civil	OLF, unemployed or unpaid	Total
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	1,076	93	34	7	219	1,634
	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	1,485
	4.65	16.5	8.22	7.27	2.09	61.28	100
Total	555	1,565	563	631	239	1,337	4,890
	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.

Table 3: Job Satisfaction: Ordered Probit Estimates

	(1)	(2)	(3)	(4)	(5)
Self-employed, employees	0.219***	0.218***	0.224***	0.255***	0.212***
	(0.072)	(0.072)	(0.074)	(0.075)	(0.076)
Self-employed, no employees	-0.070	0.031	0.069	-0.023	0.046
	(0.055)	(0.056)	(0.058)	(0.061)	(0.062)
Informal Salaried	-0.141**	-0.012	0.004	-0.121	-0.019
	(0.066)	(0.068)	(0.068)	(0.068)	(0.069)
Civil	0.134	0.059	0.050	0.094	0.040
	(0.083)	(0.084)	(0.084)	(0.085)	(0.085)
Earnings (log)		0.214***	0.204***		0.221***
		(0.020)	(0.020)		(0.021)
Hours (log)		0.470*	0.416		0.399
		(0.257)	(0.258)		(0.259)
Hours $(\log)^2$		-0.068*	-0.060		-0.056
		(0.039)	(0.039)		(0.040)
Tenure (log)			-0.021		-0.002
			(0.021)		(0.022)
Apprentice			0.121		0.061
			(0.117)		(0.120)
Household Assets (log)			0.093***		0.090***
			(0.015)		(0.015)
Male				0.019	-0.078*
				(0.044)	(0.045)
Age				-0.024*	-0.040***
				(0.013)	(0.013)
Age^2 /100				0.029*	0.047***
				(0.016)	(0.016)
Education				-0.015	-0.004
				(0.014)	(0.014)
$\text{Education}^2/100$				0.203**	0.029
				(0.095)	(0.097)
Height (Z-score)				0.039**	0.031
				(0.019)	(0.019)
Married				0.085**	0.037
				(0.043)	(0.044)
Household head				-0.079*	-0.047
				(0.042)	(0.044)
Ethnicity Dummies	No	No	Yes	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 R^2	0.024	0.039	0.044	0.027	0.046
N	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 nor reported. Standard errors in parentheses.* * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$.

Table 4: Job Satisfaction: Random Parameter Ordered Probit Models

		Without Remuneration			With Remuneration		
		(1)	(2)	(3)	(4)	(5)	(6)
	Parameter	RPOP	REOP	RERPOP	RPOP	REOP	RERPOP
Self-employed, employees	Mean	0.317***	0.255***	0.271***	0.265***	0.213***	0.230***
		(0.077)	(0.075)	(0.078)	(0.078)	(0.075)	(0.078)
	SD	0.757***		0.589***	0.725***		0.544***
		(0.056)		(0.054)	(0.056)		(0.055)
Self-employed, no employees	Mean	-0.016	-0.020	-0.021	0.059	0.047	0.049
		(0.063)	(0.066)	(0.065)	(0.064)	(0.066)	(0.064)
	SD	0.463***		0.102***	0.421***		0.117***
		(0.029)		(0.029)	(0.029)		(0.029)
Informal Salaried	Mean	-0.122*	-0.120*	-0.122*	-0.012	-0.020	-0.020
		(0.070)	(0.073)	(0.072)	(0.071)	(0.073)	(0.073)
	SD	0.508***		0.255***	0.505***		0.271***
		(0.048)		(0.048)	(0.047)		(0.048)
Civil	Mean	0.131	0.101	0.108	0.069	0.042	0.053
		(0.086)	(0.084)	(0.087)	(0.087)	(0.083)	(0.087)
	SD	0.752***		0.414***	0.763***		0.450***
		(0.070)		(0.070)	(0.070)		(0.071)
Earnings (log)	Mean				0.248***	0.224***	0.227****
					(0.021)	(0.020)	(0.021)
Hours (log)	Mean				0.455*	0.421*	0.456*
					(0.252)	(0.248)	(0.250)
Hours $(\log)^2$	Mean				-0.063*	-0.060	-0.064*
					(0.038)	(0.038)	(0.038)
Tenure (log)	Mean				-0.006	-0.001	-0.003
					(0.023)	(0.023)	(0.023)
Apprentice	Mean				0.070	0.054	0.056
					(0.132)	(0.133)	(0.134)
Household Assests (log)	Mean				0.096***	0.092***	0.090***
					(0.016)	(0.016)	(0.016)
Male	Mean	0.019	0.023	0.022	-0.088*	-0.076*	-0.077*
		(0.045)	(0.044)	(0.044)	(0.046)	(0.045)	(0.045)
Age	Mean	-0.027**	-0.023*	-0.024*	-0.044***	-0.040***	-0.041***
		(0.013)	(0.013)	(0.013)	(0.014)	(0.013)	(0.013)
Age^2 /100	Mean	0.033**	0.028*	0.030*	0.053***	0.046***	0.049***
		(0.017)	(0.017)	(0.016)	(0.017)	(0.017)	(0.017)
Education	Mean	-0.014	-0.018	-0.014	0.0001	-0.005	-0.001
		(0.015)	(0.015)	(0.015)	(0.015)	(0.015)	(0.015)
$\text{Education}^2/100$	Mean	0.209**	0.227**	0.204**	0.007	0.041	0.016
		(0.097)	(0.097)	(0.097)	(0.098)	(0.099)	(0.099)
Height (Z-score)	Mean	0.044**	0.044**	0.045**	0.035*	0.034*	0.035*
		(0.020)	(0.021)	(0.021)	(0.020)	(0.020)	(0.020)
Married	Mean	0.092**	0.088**	0.089**	0.039	0.037	0.040
		(0.044)	(0.044)	(0.044)	(0.045)	(0.045)	(0.045)
Household head	Mean	-0.099**	-0.086**	-0.094**	-0.065	-0.052	-0.059
		(0.043)	(0.043)	(0.043)	(0.044)	(0.043)	(0.043)
σ			0.283***	0.222***		0.232***	0.141***
			(0.019)	(0.019)		(0.019)	(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 nor reported. Standard errors in parentheses. * $p<0.1$, ** $p<0.05$, *** $p<0.01$.

Table 5: 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*

Table 6: Robustness to Inclusion of Individual Effects: Fixed Effects Logit

	Ordered Logit		*Fixed Effects*	
	(1)	(2)	(3)	(4)
Self-employed, employees	0.466***	0.409***	0.715***	0.694**
	(0.139)	(0.140)	(0.263)	(0.278)
Self-employed, no employees	-0.070	0.065	0.278	0.318
	(0.101)	(0.105)	(0.231)	(0.246)
Informal Salaried	-0.242**	-0.060	0.214	0.283
	(0.111)	(0.113)	(0.222)	(0.225)
Civil	0.154	0.055	-0.035	-0.147
	(0.165)	(0.167)	(0.328)	(0.331)
Earnings (log)		0.410***		0.320***
		(0.041)		(0.062)
Hours (log)		0.577		1.231
		(0.506)		(0.769)
Hours $(\log)^2$		-0.081		-0.177
		(0.078)		(0.117)
Tenure (log)		-0.008		0.005
		(0.039)		(0.078)
Apprentice		0.195		-0.205
		(0.178)		(0.388)
Household Assets (log)		0.163***		0.194***
		(0.025)		(0.050)
Male	0.018	-0.154*		
	(0.079)	(0.080)		
Age	-0.036	-0.062***	-0.304	0.190
	(0.023)	(0.023)	(0.550)	(0.572)
$\text{Age}^2/100$	0.043	0.072**		
	(0.029)	(0.029)		
Education	-0.033	-0.011		
	(0.025)	(0.024)		
$\text{Education}^2/100$	0.408**	0.096		
	(0.178)	(0.175)		
Height (Z-score)	0.062*	0.047		
	(0.034)	(0.035)		
Married	0.130*	0.033	0.039	-0.057
	(0.078)	(0.078)	(0.174)	(0.178)
Household head	-0.120	-0.067	-0.137	-0.136
	(0.076)	(0.079)	(0.135)	(0.143)
Ethnicity Dummies	Yes	Yes	No	No
City Dummies	Yes	Yes	No	No
Year Dummies	Yes	Yes	Yes	Yes
	3,242	3,242	2,130	2,130
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. Thresholds nor reported. Standard errors in parentheses. * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$.

Table 7: Robustness to Alternative Measures of Subjective Wellbeing (RERPOP)

	Parameter	Job Satisfaction (1)	Life Satisfaction (2)	Financial Satisfaction (3)
Self-employed, employees	Mean	0.179*	0.282***	0.449***
		(0.107)	(0.103)	(0.102)
	SD	0.708***	0.463***	0.661***
		(0.077)	(0.075)	(0.074)
Self-employed, no employees	Mean	-0.003	-0.050	0.237***
		(0.089)	(0.085)	(0.083)
	SD	0.224***	0.001	0.246***
		(0.039)	(0.042)	(0.040)
Informal Salaried	Mean	-0.070	-0.100	0.002
		(0.097)	(0.094)	(0.101)
	SD	0.004	0.098	0.009
		(0.063)	(0.062)	(0.070)
Civil	Mean	0.054	0.107	0.050
		(0.129)	(0.125)	(0.120)
	SD	0.797***	0.823***	0.812***
		(0.106)	(0.108)	(0.106)
Earnings (log)	Mean	0.253***	0.225***	0.277***
		(0.029)	(0.029)	(0.028)
Hours (log)	Mean	0.539*	0.424	0.311
		(0.303)	(0.310)	(0.304)
Hours $(\log)^2$	Mean	-0.081*	-0.068	-0.047
		(0.048)	(0.049)	(0.047)
Tenure (log)	Mean	0.020	-0.014	-0.021
		(0.032)	(0.032)	(0.032)
Apprentice	Mean	0.073	0.084	0.221
		(0.154)	(0.170)	(0.178)
Household Assests (log)	Mean	0.088***	0.094***	0.090***
		(0.023)	(0.022)	(0.023)
Male	Mean	-0.042	-0.253***	-0.208***
		(0.065)	(0.064)	(0.062)
Age	Mean	-0.048**	-0.066***	-0.046**
		(0.019)	(0.018)	(0.019)
$\text{Age}^2/100$	Mean	0.055**	0.077***	0.055**
		(0.024)	(0.023)	(0.024)
Education	Mean	-0.030	-0.019	-0.028
		(0.022)	(0.023)	(0.022)
$\text{Education}^2/100$	Mean	0.215	0.297*	0.298**
		(0.152)	(0.159)	(0.146)
Height (Z-score)	Mean	0.019	0.025	0.00001
		(0.028)	(0.028)	(0.026)
Married	Mean	0.034	0.198***	-0.038
		(0.063)	(0.064)	(0.062)
Household head	Mean	-0.088	0.003	0.012
		(0.059)	(0.060)	(0.058)
σ		0.019	0.204***	0.029
		(0.026)	(0.027)	(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 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 nor reported. Standard errors in parentheses. * $p<0.1$, ** $p<0.05$, *** $p<0.01$.

Table 8: Robustness to Attrition: Job Satisfaction

	Parameter	(1)	(2)
Self-employed, employees	Mean	0.239	0.250*
		(0.151)	(0.150)
	SD		0.194
			(0.136)
Self-employed, no employees	Mean	0.158	0.150
		(0.132)	(0.155)
	SD		0.303
			(0.218)
Informal Salaried	Mean	0.122	0.679***
		(0.147)	(0.100)
	SD		0.048
			(0.061)
Civil	Mean	0.183	0.284***
		(0.203)	(0.094)
	SD		0.598***
			(0.189)
Earnings (log)	Mean	0.153***	0.156***
		(0.040)	(0.044)
Hours (log)	Mean	0.605	0.639
		(0.516)	(0.544)
Hours $(\log)^2$	Mean	-0.069	-0.067
		(0.078)	(0.081)
Tenure (log)	Mean	-0.021	-0.037
		(0.047)	(0.053)
Apprentice	Mean	0.251	0.228
		(0.342)	(0.424)
Household Assests (log)	Mean	0.069**	0.066*
		(0.033)	(0.038)
Male	Mean	-0.074	-0.049
		(0.091)	(0.100)
Age	Mean	-0.049	-0.047
		(0.031)	(0.030)
$\text{Age}^2/100$	Mean	0.057	0.056
		(0.038)	(0.038)
Education	Mean	-0.007	0.003
		(0.030)	(0.033)
$\text{Education}^2/100$	Mean	0.005	-0.052
		(0.213)	(0.225)
Height (Z-score)	Mean	0.002	0.0001
		(0.040)	(0.042)
Married	Mean	0.121	0.140
		(0.091)	(0.101)
Household head	Mean	-0.044	-0.068
		(0.086)	(0.096)
σ			0.248***
			(0.039)
Ethnicity Dummies		Yes	Yes
City Dummies		Yes	Yes
Year Dummies		Yes	Yes
LL		-1034.690	-1029.193
Finite Sample AIC		2.730	2.730
HQ IC		2.804	2.814
N		784	784
Individuals		784	249

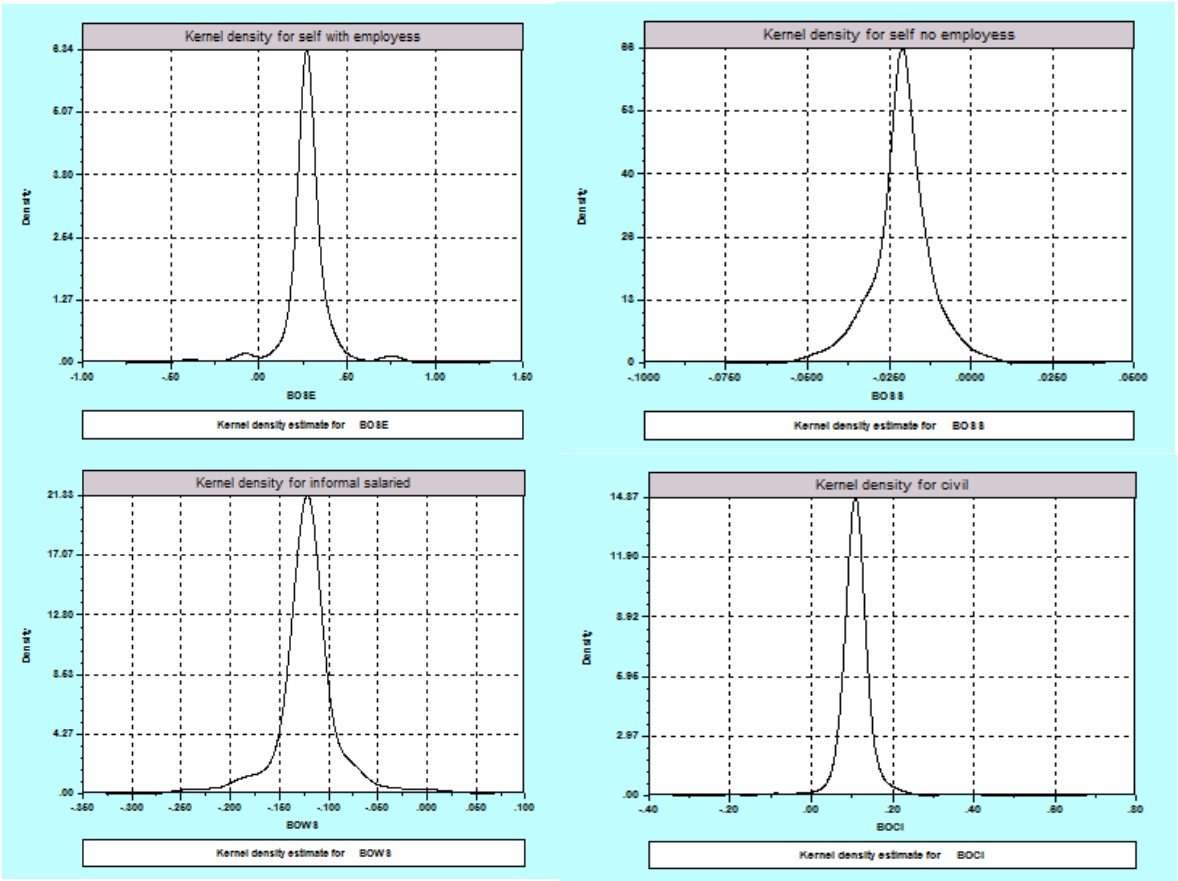
Note: Estimation by Ordered Probit and Random Effects Random Parameter Ordered Probit. Following Dunne et al (1989), the sample includes only long-survivors who are observed in every wave after first appearance. The dependent variable is Job satisfaction which is an ordered variable with the following 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. Parameters for all job types- Self with employees Self-no employees, Informal Salaried and Civil are assumed to follow a normal distribution. Estimates 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 nor reported. Standard errors in parentheses. * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$.

Table 9: Sources of Premia and Heterogeneity: Autonomy, Job Characteristics and Risk Aversion (RERPOP)

		Autonomy		Occupation and Sector		Risk Aversion	
	Parameter	(1)	(2)	(3)	(4)	(5)	(6)
Self-employed, employees	Mean	0.189*	0.198*	0.243***	0.335***	0.361	0.359
		(0.110)	(0.110)	(0.085)	(0.098)	(0.231)	(0.232)
	SD	0.707***	0.704***	0.571***	0.578***	0.0002	0.004
		(0.077)	(0.077)	(0.055)	(0.055)	(0.157)	(0.158)
Self-employed, no employees	Mean	0.026	0.030	0.050	0.136	-0.155	-0.163
		(0.093)	(0.093)	(0.075)	(0.091)	(0.168)	(0.169)
	SD	0.179***	0.185***	0.151***	0.154***	0.182**	0.178**
		(0.040)	(0.040)	(0.029)	(0.029)	(0.074)	(0.074)
Informal Salaried	Mean	-0.052	-0.046	0.002	0.043	-0.195	-0.212
		(0.099)	(0.099)	(0.085)	(0.086)	(0.192)	(0.195)
	SD	0.012	0.010	0.064	0.062	0.025	0.029
		(0.063)	(0.064)	(0.056)	(0.056)	(0.134)	(0.133)
Civil	Mean	0.063	0.066	0.076	0.060	0.205	0.201
		(0.132)	(0.132)	(0.110)	(0.113)	(0.227)	(0.227)
	SD	0.769***	0.768***	0.653***	0.647***	0.417**	0.415**
		(0.107)	(0.107)	(0.091)	(0.091)	(0.204)	(0.204)
Control (self-reported)	Mean		0.046				
			(0.034)				
Wage & Manufacturing	Mean				0.060		
					(0.097)		
Self & Trade	Mean				0.009		
					(0.056)		
Wage & not a manual laborer	Mean				0.176**		
					(0.085)		
Risk Aversion	Mean						-0.004
							(0.008)
σ		0.006	0.006	0.092***	0.087***	0.102**	0.087*
		(0.027)	(0.027)	(0.020)	(0.020)	(0.050)	(0.050)
Ethnicity Dummies		Yes	Yes	Yes	Yes	Yes	Yes
City Dummies		Yes	Yes	Yes	Yes	Yes	Yes
Year Dummies		Yes	Yes	Yes	Yes	Yes	Yes
Other controls		Yes	Yes	Yes	Yes	Yes	Yes
LL		-2177.824	-2176.940	-3597.253	-3595.069	-595.914	-595.719
Finite Sample AIC		2.566	2.566	2.578	2.579	2.612	2.616
HQ IC		2.607	2.609	2.608	2.611	2.724	2.731
N		1726	1726	2821	2821	487	487
Individuals		1194	1194	1376	1376	197	197

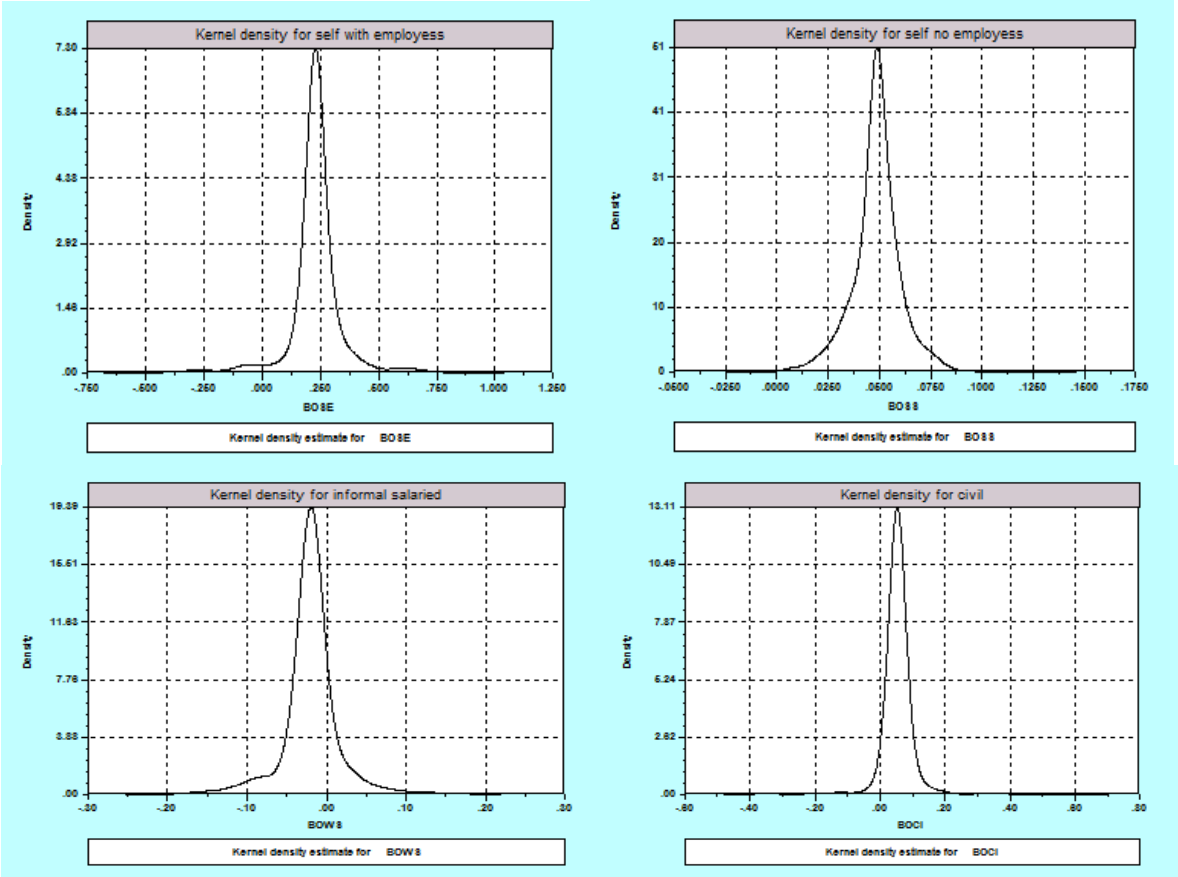
Note: Estimation by Random Effects Random Parameter Ordered Probit (RERPOP). The dependent variable is Job satisfaction which is an ordered variable with the following categories: 1. Very Dissatisfied, 2. Dissatisfied, 3. Neither Satisfied nor Dissatisfied 4. Satisfied, 5. Very Satisfied. Sample common 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 random effect parameter which is estimated assuming a random constant. Controls in both models correspond to Earning (log), Hours (log), Hours (log)^2, Tenure (log), Apprentice, Household Assets (log), Male, Age, Age^2/100, Education, Education^2/100, Height (Z-score), Married, Household head, Ethnicity dummies and city dummies. 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 nor reported. Standard errors in parentheses. * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$.

Figure 1: Distribution of Job Satisfaction by Sector (Model 3)



Note: The kernel densities correspond to the conditional mean of β_{ik}, that is, the figure shows the kernel densities for the distribution of estimates of $E(\beta_{ik}|y_i, \boldsymbol{x}_i)$ across the sample. See Greene and Hensher (2010b) for more information on how to obtain this estimation.

Figure 2: Distribution of job Satisfaction by Sector, Conditional on Remuneration (Model 6)



Note: The kernel densities correspond to the conditional mean of β_{ik}, that is, the figure shows the kernel densities for the distribution of estimates of $E(\beta_{ik}|y_i, \boldsymbol{x}_i)$ across the sample. See Greene and Hensher (2010b) for more information on how to obtain this estimation.

Table 10: Combining Self-Employed

	Parameter	(1)	(2)
Self-employed	Mean	0.048	0.089
		(0.063)	(0.063)
	SD	0.187***	0.093***
		(0.024)	(0.025)
Informal Salaried	Mean	-0.114	-0.013
		(0.073)	(0.073)
	SD	0.184***	0.165***
		(0.047)	(0.047)
Civil	Mean	0.111	0.054
		(0.087)	(0.088)
	SD	0.359***	0.383***
		(0.069)	(0.070)
Earnings (log)	Mean		0.231***
			(0.020)
Hours (log)	Mean		0.411*
			(0.247)
Hours $(\log)^2$	Mean		-0.058
			(0.037)
Tenure (log)	Mean		-0.001
			(0.023)
Apprentice	Mean		0.074
			(0.132)
Household Assests (log)	Mean		0.095***
			(0.016)
Male	Mean	0.035	-0.073
		(0.044)	(0.045)
Age	Mean	-0.026**	-0.042***
		(0.013)	(0.013)
$\text{Age}^2/100$	Mean	0.032*	0.050***
		(0.016)	(0.017)
Education	Mean	-0.014	-0.002
		(0.014)	(0.015)
$\text{Education}^2/100$	Mean	0.215**	0.025
		(0.097)	(0.099)
Height (Z-score)	Mean	0.047**	0.036*
		(0.021)	(0.020)
Married	Mean	0.104**	0.049
		(0.044)	(0.045)
Household head	Mean	-0.076*	-0.042
		(0.042)	(0.043)
σ		0.245***	0.198***
		(0.019)	(0.019)
Ethnicity Dummies		Yes	Yes
City Dummies		Yes	Yes
Year Dummies		Yes	Yes
LL		-4223.207	-4138.240
Finite Sample AIC		2.625	2.576
HQ IC		2.645	2.601
N		3242	3242
Individuals		1434	1434

Table 11: Share of Sector that Would not Prefer Formal Employment

	Model (1)	Model (2)
Self-employed	60%	83%
Informal Salaried	27%	47%
Civil	62%	56%

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 10*