Chapter 4

Are Workers Compensated for Accepting Vulnerable Jobs? Evidence from West Africa

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One of the main focuses of studies on labor markets in Sub-Saharan Africa is the institutional segmentation between formal and informal sectors (Maloney 2004; see also chapter 6). Informal work is defined from the point of view of the firm, worker, or line of business, depending on the policy aim. The 1993 System of National Accounts (SNA93)—a set of international standards designed to establish a framework for the production of statistics on national accounts—classifies firms based on statistical or tax registration criteria and whether they keep written accounts. This distinction serves no purpose when it comes to capturing individuals' working conditions, especially employment vulnerability.

The concept of vulnerability refers to how difficult it is for individuals to manage the risks or cope with the losses and costs associated with the occurrence of risky events or situations.[1] The vulnerability of workers can be seen, for example, in contract insecurity (unstable remuneration and no written contract); adverse working conditions; and, more generally, a high level of exposure to job risks. Firm or business vulnerability criteria (industry, business size, and institutional sector) are not used here, because they reflect interfirm rather than interindividual dualism.

Vulnerable workers can be found in all formal and informal private firms; they work in public and semi-public corporations as well. This chapter focuses solely on the private sector (formal and informal businesses), based on the assumption that vulnerability is driven by different mechanisms in the public and private sectors.

The theory of compensating differentials—as formalized by Brown (1980), Rosen (1986), and Murphy and Topel (1987)—posits that workers may receive

pecuniary compensation commensurate with the danger or strenuousness of their tasks or the adverse nature of their working conditions.[2] In developed countries, for instance, everything else equal, hazardous and highly strenuous jobs are often better paid than jobs without these attributes.[3] Our interpretation of the link between vulnerability and income draws on developments in the theory of compensating differentials, which we apply to both working conditions and employment vulnerability for the first time in African countries. Our working assumption is that, other things equal, workers classified as vulnerable earn more than more stable, steady workers classified as less vulnerable. If this is the case, some individuals will be willing to hold vulnerable jobs, especially if the immediate need to earn income outweighs the medium- or long-run advantage associated with stable jobs.

The questions of what determines vulnerability and how vulnerability and remuneration are linked raise several methodological problems, which this chapter tries to solve. First, entry selection occurs in the labor market. Second, sample selection concerns the individual's sector allocation (public, formal private, or informal). Observable individual characteristics (such as human capital in general) as well as unobservable individual characteristics influence both the decision to participate in a particular labor market segment and the level of individual earnings in Africa. Third, vulnerability is likely to be endogenous in the earnings equations. It is endogenous if individuals' unobservable characteristics are correlated with both their level of vulnerability and their level of earnings. It is important to take these effects into account, because they can produce biases, such as overestimation of the impact of vulnerability on individual earnings if, for example, unobservable characteristics such as low worker motivation or ability (or conversely, worker perseverance) are positively correlated with the probability of obtaining a vulnerable job and negatively correlated with earnings.

Our analysis takes a distributional approach.[4] It assumes that the worker's relative position on the remuneration scale influences how vulnerability affects income. Whereas workers with vulnerable jobs at the low end of the pay scale receive less in compensation than workers with identical characteristics who do not hold vulnerable jobs, workers in vulnerable jobs at the high end of the pay scale are paid premiums. These different mechanisms could reflect differences in bargaining power and labor market imbalances. Their greater bargaining would enable workers at the upper tail of the earnings distribution to secure higher pay for greater vulnerability. Conversely, workers at the bottom of the earnings distribution may be more forceful in negotiating for premium pay if they are seeking to secure a living wage. Compensation for vulnerability therefore would decrease the further the worker moves from a minimum subsistence income. In the case of labor market imbalances, employers' capacity to provide financial compensation for adverse working conditions may also depend on

the demand for and supply of labor. Where, for example, labor supply outstrips demand, employers do not need to compensate workers for adverse working conditions.

All these hypotheses, which assume that the effect of vulnerability on earnings differs depending on the position in the earnings distribution, are tested by quantile regressions.

The chapter is organized as follows. The first section briefly examines the theoretical arguments underlying the existence of compensating differentials and highlights the theory's implications for the case study. The second section presents the data from the 1-2-3 surveys of the West African economic capitals and shows how key variables were constructed.[5] The third section presents the econometric models. The fourth section discusses the results. The last section draws conclusions.

The Theory of Compensating Differentials

There is a long history of economic research into the forces that narrow or widen wage differentials between individuals. The first models focused on competitive markets. They found wage premiums compensating nonpecuniary job attributes, such as working conditions, and differences in job stability across industries (Brown 1980; Rosen 1986; Murphy and Topel 1987). Most authors acknowledge that when job characteristics other than wages enter into the labor market decisions of firms and workers, market balance is achieved by the equalization of workers' utilities rather than their wages.

Rosen (1986) posits that the reasoning behind compensating mechanisms is a simple supply-and-demand structure. Labor supply decisions have to balance the trade-off between earned income (wages) and the cost of performing a job (stress, repetition, production deadlines, and so forth) such that, at the optimum, wage differences correspond to the marginal rate of substitution between consumption and working conditions. Labor demand decisions by firms are based on a trade-off between the need to provide compensation commensurate with the strenuous or hazardous nature of a task and the need to improve the working conditions offered.

Under the assumption of homogeneous individuals and heterogeneous work environments, wages across workers differ such that all workers obtain the same utility. To encourage workers to accept worse working conditions, firms have to offer higher wages. Lifting the assumption of homogeneous individuals necessarily introduces a great deal of uncertainty as to the existence of compensation for working conditions when it is observed at the midpoint of the worker distribution. It could prove necessary to divide the population into more homogeneous groups—by, for example, using a conditional wage quantile derived

from quantile regressions, in order to reduce the noise created by the presence of individual heterogeneity in the estimation of the compensating differential.

Noncompetitive theories argue that wage deviations between apparently identical individuals tend to reflect noncompensating differentials, such as workers' relative bargaining power (Daniel and Sofer 1998; Manning 2003) and the existence of efficiency wages.[6] Other hypotheses point to the existence of information asymmetries, which may increase friction in the match between the supply of and demand for labor (Hwang, Mortensen, and Reed 1998), and interfirm differences in factor productivity (Burdett and Mortensen 1998; Pissarides 2000; Mortensen 2003).

There is a dearth of research on the link between compensating differentials and observed job attributes, especially when it comes to distributional approaches.[7] Fernández and Nordman (2009) show that the compensating differential probably depends on the worker's relative position in the earnings distribution. For example, pecuniary compensation for adverse working conditions could well be overestimated if the most capable (or resistant) workers are selected for employment where these attributes are more common. Moreover, given the assumption that the most capable individuals are also the most likely to receive efficiency wages, or to have a certain amount of bargaining power, working conditions could well have less to do with the wage-setting process for these individuals than for workers without these characteristics. More generally, workers could find it easier to ask for premiums for adverse working conditions when the demand for labor exceeds the supply, creating a labor market imbalance that probably varies along the earnings distribution.

Data and Definition of Vulnerability

The data come from Phase 1 of the 1-2-3 surveys conducted in the following economic capitals in 2001/02: Abidjan (Côte d'Ivoire), Bamako (Mali), Cotonou (Benin), Dakar (Senegal), Lomé (Togo), Niamey (Niger), and Ouagadougou (Burkina Faso) (for a description of the surveys, see box O.1 in the overview). The sample was restricted to all working-age individuals as defined by International Labour Organization (ILO)—that is, people 15 and older. It was then reduced to include only people with at least five years of potential labor market experience, in order to take account of workers' employment histories and thereby understand the longitudinal aspects of vulnerability. Potential experience is defined as the individual's age minus the number of years of education and the six years theoretically preceding the start of school. The five-year potential experience span is broad enough to circumvent the problem of date measurement errors (end of education and end of previous job) and narrow enough to prevent the samples from being too small.

The sample was reduced from 58,385 individuals 15 and older to 50,772 individuals 15 and older with five years or more of potential experience, from 33,390 employed workers 15 and older to 32,314 employed workers 15 and older with five years or more of potential experience. Among the employed workers, we are interested only in formal and informal private sector workers with some income. Informal work is defined from the point of view of the firm, worker, or line of business, depending on the policy aim. The 1993 System of National Accounts—a set of international standards designed to establish a framework for the production of statistics on national accounts—defines informality based on statistical or tax registration criteria and the keeping of written accounts.

The formal private sector regression samples include 302–950 workers (depending on the country), with a small minority of self-employed workers (table 4.1). The informal private sector regression samples range from 2,230 to 3,492 workers, with a majority of self-employed workers. Individuals with no income are people with five years of potential experience who are not working (as wage or self-employed workers). Unpaid (contributing) family workers are included among the self-employed, because they share profits with the leading independent worker in the family. Earnings for dependent workers include wages and benefits (bonuses, paid holidays, housing, benefits in kind, and so forth). Nonmonetary benefits are converted into wages. Profits of independent workers were reconstituted by recapping income and expenses (including intermediary spending, employee's wages, taxes, investment) over a reference period to which the respondent could relate. For both dependent and independent workers, monthly net income was estimated and divided by the number of hours worked per month to obtain hourly earnings.

Construction of the Vulnerability Variables

We used a number of individual employment status indicators, which we believe best capture the multifaceted nature of vulnerability in the main job. Business or production unit criteria (industry, business size, and institutional sector) were not used, because they reflect interfirm rather than interworker differences.

Worker vulnerability is defined by nine dichotomous variables, corresponding to different aspects of vulnerability (table 4.2). The variables distinguish independent workers (employers and own-account workers) from dependent workers (employees, contributing family workers, and apprentices).

The first variable, contractual insecurity, concerns the informal nature of the contract. This variable equals 1 if the individual has no written contract or does not receive a payslip and 0 otherwise. (It is not defined for self-employed workers, to whom it does not apply.) No distinction is made between workers with fixed-term contracts and workers with open-ended contracts.

Table 4.1 Descriptive Statistics of Study Sample in Seven Cities in West Africa

Statistic	Abidjan	Bamako	Cotonou	Dakar	Lomé	Niamey	Ouagadougou
Sample total	11,343	13,002	11,574	19,054	9,906	14,524	13,733
Working-age population	7,503	7,529	7,639	12,487	6,418	8,284	8,525
Working-age population with five or more years potential experience	6,537	6,561	6,517	11,014	6,546	7,269	7,328
Working-age population with zero income	2,568	2,746	2,374	6,074	2,081	4,053	3,663
Public sector (positive earnings)	302	457	398	498	306	577	584
Regression samples							
Formal private sector (positive earnings)	825	452	509	950	302	409	336
Dependent	782	365	423	868	261	373	307
Independent	43	87	86	82	41	36	29
Informal sector (positive earnings)	2,842	2,906	3,236	3,492	2,857	2,230	2,745
Dependent	894	528	460	1,123	508	562	724
Independent	1,948	2,378	2,776	2,369	2,349	1,668	2,021

Sources: Based on Phase 1 of the 1-2-3 surveys of selected countries in the West African Economic and Monetary Union (WAEMU) conducted in 2001/02 by the Observatoire économique et statistique d'Afrique Subsaharienne (AFRISTAT); Développement, Institutions et Mondialisation (DIAL); and national statistics institutes.

Table 4.2 Distribution of Vulnerability Criteria by Sector and Job Status in Seven Cities in West Africa

	Criterion/job status		
Criterion	**Formal private sector**	**Informal sector**	**All private sector**
Contractual insecurity (no contract or no payslip)			
Independent	n.a.	n.a.	n.a.
Dependent	0.49	0.97	0.76
All	n.a.	n.a.	n.a.
Independent with no employees (wage-earning or otherwise)			
Independent	0.11	0.68	0.66
Dependent	n.a.	n.a.	n.a.
All	n.a.	n.a.	n.a.
Adverse working conditions (premises not dedicated to the job)			
Independent	0.17	0.60	0.59
Dependent	0.05	0.22	0.15
All	0.06	0.50	0.42
Casual labor (piece-rate, day, or seasonal work)			
Independent	0.13	0.20	0.20
Dependent	0.10	0.15	0.13
All	0.10	0.19	0.17
Unstable remuneration (paid in form other than fixed wage or, for independent workers, profits)			
Independent	0.06	0.05	0.05
Dependent	0.18	0.40	0.31
All	0.17	0.14	0.15
Time-related underemployment (works fewer hours than statutory working week and would like to work more)			
Independent	0.09	0.13	0.13
Dependent	0.07	0.07	0.07
All	0.07	0.12	0.11
Working second vulnerable job outside public sector in place or premises not dedicated to the job, in firm with fewer than five people			
Independent	0.00	0.02	0.02
Dependent	0.01	0.01	0.01
All	0.01	0.01	0.01
Employment instability (on downwardly mobile or unstable career path)			
Independent	0.01	0.03	0.03
Dependent	0.08	0.08	0.08
All	0.07	0.04	0.05
Unwanted job (involuntary departure from previous job or job dissatisfaction)			
Independent	0.05	0.06	0.06
Dependent	0.09	0.06	0.07
All	0.09	0.06	0.06

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Table 4.2 (continued)

Criterion	Criterion/job status		
	Formal private sector	Informal sector	All private sector
Vulnerable (meets at least one of the vulnerability criteria)			
Independent	0.42	0.87	0.86
Dependent	0.62	0.98	0.82
All	0.60	0.90	0.85

Sources: Based on Phase 1 of the 1-2-3 surveys of selected countries (see table 4.1 for details).
Note: The mean of the contractual insecurity variable for the subsample of formal private sector dependent workers who report strictly positive earnings is 0.49. This means that 49 percent of dependent workers in the formal private sector do not have a written contract or do not receive a payslip. n.a. = not applicable.

The second variable concerns independent workers only. It is equal to 1 if an independent worker has no employees, wage-earning or otherwise. Self-employed professionals working alone in intellectual professions (computer engineers, doctors, notaries, lawyers) are not considered to be vulnerable.

Adverse working conditions are assessed in terms of the place or premises where the individual works. This variable is equal to 1 if the individual's main job is itinerant, worked from a makeshift or fixed street post, at the customer's home, or from the individual's own home without having a dedicated set-up for the job. It is equal to 0 if the individual works from a vehicle, from home with a dedicated set-up for the job, in a public market, or on business premises (including fields, in the case of urban market gardening). Where jobs do not require premises even though they are not physically strenuous, the existence of premises, an office, or a surgery is taken as an indication of stability and nonadverse working conditions. Excluding all intellectual professions from vulnerability in terms of working conditions would be tantamount to defining a vulnerable worker profile as consisting mainly of roving street vendors and servants. Doing so would be inconsistent with the analysis of the many forms of vulnerability and the link with earnings.

Casual labor is a source of vulnerability. According to Pagès (2003), vulnerability in employment covers both various forms of underemployment and the lack of socioeconomic security at work associated with institutional variables (employment contracts, compliance with labor code, and so forth) and their time-related factors (casual and unstable employment). Thus, even if a job is protected or offers good conditions, the casual nature of employment means that this protection is not guaranteed over time and that the risk of visible underemployment is high. Therefore, a casual job is deemed a criterion of vulnerability. The casual labor variable is equal to 1 if the individual works for a piece rate or as a day or seasonal worker. It is equal to 0 if the individual has a steady job.

The unstable remuneration variable is equal to 1 if a dependent worker is not paid a fixed wage or if an independent worker is not paid in the form of a fixed wage or profits (by the day or hour, piece rate, commission, or in kind). This variable differs from the variable describing casual jobs. A worker in a steady job may be paid erratically (as is frequently the case). Such workers are assumed to be more vulnerable, because they cannot predict what their situation will be in the coming days or weeks.

Pagès (2003) defines vulnerability as underemployment or the probability of becoming underemployed. Time-related underemployment corresponds to the situation in which individuals work less than the statutory working week when they would like to work more. Time-related underemployment is similar to structural unemployment (see chapters 1 and 2). The underemployment variable is equal to 1 if the individual works less than 35 hours and would like to work more. It is equal to 0 otherwise.

Working a second job could, in certain cases, reflect underemployment or instability in the main job. Time-related or invisibly underemployed individuals or piece-rate workers may hold second jobs to keep money coming in when they are temporarily laid off from their main job.[8] Working a second job may be a way of reducing or spreading the risks of an income loss or decrease. The second job variable is equal to 1 if the individual works a vulnerable second job—that is, a job outside the public sector, in a place or premises not dedicated to this job and in a firm of less than five people—and if the number of cumulative hours worked in the two jobs is 70 hours or more a week. It is equal to 0 otherwise.

Pagès (2005) emphasizes the importance of considering the dynamic aspect of vulnerability. The above employment situations affect workers' capacities and behavior (the skills-employment causality is reversed). We define two dynamic vulnerability criteria. Instability in employment is defined by a change of job in the last five years without an improvement or with a drop in status.[9] This variable is equal to 0 if the individual is in his or her first job or found a job following a period of unemployment or inactivity over the last five years. It is also equal to 0 if the individual has been in the same job for five years or the individual upgraded his or her job status (from the point of view of socioeconomic group, reflecting upward professional mobility) in the last five years. It is equal to 1 when the individual changed job in the last five years without an improvement in status. In the case of a transition from independent to dependent worker (or vice versa), the reason for the change of job (voluntary or involuntary) is used to determine whether or not the transition represents an upwardly mobile professional move.

An unwanted job is defined as a job with which the worker is dissatisfied and that he or she accepted following an involuntary departure from the previous job. Job dissatisfaction is measured by the answer to a question about the individual's aspirations (keep or change job and, if the respondent indicates the

desire to change, for what type of job; see chapter 3). An unwanted job is more likely to be worked because of constraints and is hence mismatched with the worker's expertise, skills, and preferences. Workers may be dissatisfied because they are overqualified for their job, because working conditions are physically strenuous, because the hours are unsuitable, or for other reasons. Working an unwanted job may indicate that a worker has taken a "stopgap job" in the hope of immediate gains.

Other potential vulnerability criteria were not taken into account. For example, we do not create a social security variable, because our income variable includes all welfare benefits. Unstable remuneration or lack of a written contract, for example, should be enough to reflect social insecurity. Membership in a union and access to in-house training are variables of interest. However, these phenomena are so rare in the cities studied that we deemed them negligible.

For each employment status (dependent or independent), we define the intensity of vulnerability as the sum of the eight previously defined criteria applicable to this status. Maximum vulnerability intensity ranges from 4 to 7 depending on the city and sector. No city posts the maximum score of 8 (table 4.3).

A dichotomous dummy variable for vulnerability, built by setting a vulnerability threshold (a minimum number of vulnerability criteria to be met to be deemed vulnerable) would have simplified our measurement. However, the effect of vulnerability on earnings might be nonlinear, which would not be revealed by a dichotomous dummy variable. The fact that a worker meets one or two vulnerability criteria may reflect constraints imposed by the labor market. However, workers may choose to accept more vulnerable working conditions if doing so yields higher earnings.

Descriptive Statistics

Contractual insecurity affects 97 percent of dependent workers in the informal sector (see table 4.2). Surprisingly, it also affects half of employees in the formal private sector, 49 percent of whom do not have written contracts or receive payslips. Similarly, 18 percent of dependent workers in the formal private sector and 40 percent of dependent workers in the informal sector do not receive a fixed wage. These figures suggest that the distinction between formal private firms and informal firms is not sufficient for analyzing workers' living and working conditions: worker vulnerability needs to be examined in all institutional sectors.

The main sources of vulnerability among independent workers in the informal sector are adverse working conditions (faced by 60 percent of independent workers), including the lack of dedicated premises or workplace, and own-account employment (that is, not having any employees, 68 percent of independent workers). These percentages are small in the formal private sector, where

Table 4.3 Intensity of Job Vulnerability in Seven Cities in West Africa

Sector/ intensity (0–8)	Abidjan		Bamako		Cotonou		Dakar		Lomé		Niamey		Ouagadougou	
	Number of workers	Percent	Number of workers	Percent	Number of workers	Percent	Number of workers	Percent	Number of workers	Percent	Number of workers	Percent	Number of workers	Percent
Formal private sector														
0	321	38.9	185	40.9	194	38.1	424	44.6	90	29.8	136	33.3	129	38.4
1	280	33.9	175	38.7	199	39.1	243	25.6	116	38.4	112	27.4	110	32.7
2	145	17.6	68	15.0	69	13.6	160	16.8	58	19.2	87	21.3	55	16.4
3	42	5.1	19	4.2	35	6.9	88	9.3	27	8.9	46	11.3	26	7.7
4	28	3.4	5	1.1	11	2.2	29	3.1	7	2.3	23	5.6	16	4.8
5	8	1.0	0	0.0	0	0.0	6	0.6	3	1.0	4	1.0	0	0.0
6	1	0.1	0	0.0	1	0.2	0	0.0	1	0.3	1	0.2	0	0.0
7	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Total	825	100	452	100	509	100	950	100	302	100	409	100	336	100
Informal sector														
0	347	12.2	263	9.1	306	9.5	286	8.2	267	9.4	126	5.7	329	12.0
1	995	35.0	933	32.1	1,029	31.8	1,077	30.8	738	25.8	502	22.5	848	30.9
2	972	34.2	1,035	35.6	1,241	38.4	1,102	31.6	1,052	36.8	761	34.1	907	33.0
3	372	13.1	495	17.0	488	15.1	644	18.4	508	17.8	502	22.5	450	16.4
4	124	4.4	154	5.3	151	4.7	300	8.6	235	8.2	263	11.8	166	6.1
5	23	0.8	25	0.9	19	0.6	72	2.1	49	1.7	68	3.1	40	1.5
6	8	0.3	1	0.0	2	0.1	10	0.3	8	0.3	8	0.4	5	0.2
7	1	0.0	0	0.0	0	0.0	1	0.0	0	0.0	0	0.0	0	0.0
Total	2,842	100	2,906	100	3,236	100	3,492	100	2,857	100	2,230	100	2,745	100

Sources: Based on Phase 1 of the 1-2-3 surveys of selected countries (see table 4.1 for details).
Note: The lines cutting across the distributions represent the average vulnerability intensity position. For example, in the formal private sector in Niamey, average vulnerability is 1.3, so a line is drawn between 1 and 2.

self-employed workers represent less than 20 percent of workers in all cities studied. Working conditions for independent and dependent workers in the informal sector are very similar. Most independent workers are self-employed street vendors; others are tailors, hairdressers, repairers, mechanics, masons, carpenters, and metalworkers. Similarity in working conditions justifies analyzing all informal workers in one category, controlling for their dependency status as a covariate.

Some 17 percent of dependent private sector workers and 14 percent of independent private sector workers are not vulnerable (do not meet any vulnerability criteria). These rates mask huge differences between the formal and informal sectors. In the informal sector, just 2 percent of dependent workers and 12 percent of independent workers are not vulnerable. In all, 85 percent of the private sector workers in the cities studied meet at least one vulnerability criterion.

Testing the Existence of Compensating Mechanisms for Vulnerability

In a first step, the determinants of vulnerability are analyzed using a simple linear model whose dependent variable is the intensity of vulnerability. The explanatory variables introduced are dummy variables for the individual's status in the household (1 if household head) and the institutional sector of the individual's father when the individual was 15 years old (public, formal private, or informal private). These first variables are denoted Z. The set of control variables included in all the estimated equations (X) covers gender; education (number of years of completed education) and its square; potential experience and its square; religion; migrant status (rural, urban, or foreign migrant); marital status; seniority in the firm or main job and its square; and independent versus dependent worker status.

To test the existence of compensating earnings differentials for vulnerability, we estimate the log of the hourly earnings rate for the main job for each city. Included in this earnings rate are benefits such as year-end bonuses, profit-sharing, paid leave, medical benefits, social security, bonuses, and benefits in kind, such as housing, electricity, and transport. Earnings are calculated based on the monthly earnings for the reference month and the number of hours worked per week.

Approach at the Mean

An approach at the mean studies the impact of vulnerability intensity on average earnings. In this approach, what counts is the cumulative number of vulnerability criteria met by an individual.

Let h be an indicator of four institutional sector categories ($h = 1$: zero earnings, $h = 2$: public sector, $h = 3$: formal private sector, and $h = 4$: informal sector). Our purpose is to estimate the effect $\varphi_h = (\varphi_{1h}, \varphi_{2h})$ of vulnerability index I on earnings in the formal and informal private sectors using

$$Y_h = \beta_h X + \varphi_{1h} I + \varphi_{2h} I^2 + \varepsilon_h \ \forall h = 3,4. \tag{4.1}$$

Introduction of a second-degree vulnerability intensity polynomial I^2 is designed to take into account any nonlinearity in the effect of vulnerability on earnings. Y_h is observed only if the individual has a paid job and chooses sector h.

Given that the labor markets in developing countries are segmented, sector entry selection may exist in addition to labor market entry selection (see chapters 5 and 6). A selection model is therefore needed. We use Lee (1983), an extension of Heckman's method, to estimate the earnings equation with multinomial selection. This method corrects the selection bias, by estimating

$$Y_h = \beta_h X + \varphi_{1h} I + \varphi_{2h} I^2 + \lambda_h + \kappa_h \ \forall h = 3,4 \tag{4.2}$$

where λ_h, a generalization of the inverse Mills ratio in Heckman's method, corrects the selection bias generated by the fact that belonging to sector h rather than sector k ($k \neq h$) may reflect the action of unobservable variables also associated with income. The selection effect is interpreted as the difference between the earnings of a first individual in sector h and the income that would have been earned by a second individual—drawn randomly from the first equation sample (that is, an individual from any sector) and with the same observable characteristics as the first individual—had he or she belonged to sector h.

The identifying variables (M) required for the robustness of the selection model are the inverse of the dependency ratio (the ratio of the number of employed workers to household size); a dummy variable for whether the individual's father went to primary school; and a dummy variable for whether the individual's head of household is a woman. These variables are introduced into the selection equation (multinomial logit model with four categories for h: 1,…, 4), but not into the earnings equation. The assumption is that these variables influence earnings only through sector allocation.[10]

A second problem that needs to be addressed is the potential endogeneity of the intensity of vulnerability. Unobservable characteristics may affect both the explanatory variable for vulnerability and the level of earnings. This would be the case, for example, if "poor" workers were selected for employment statuses in which vulnerability is greatest. In this case, any positive effect vulnerability might have on earnings could be underestimated. As disregarding this factor could produce nonconvergent estimators of $\varphi_h = (\varphi_{1h}, \varphi_{2h})$, the vulnerability intensity indicator needs to be instrumented.

To do so, we use the control function method rather than the two-stage least squares estimator (Garen 1984; Wooldridge 2005). Where earnings are

nonlinear in the potentially endogenous variable (here vulnerability intensity), this method provides more accurate estimators than the two-stage least squares method (Card 2001). The control function method involves regressing the intensity of vulnerability on the individual characteristics X and the instrumental variables Z, not correlated with κ; the residual from the earnings equation (equation 4.2) and (partially) correlated with I (equation 4.3). These instruments are the dummy variables for the status of the head of household and the dummy variables for the institutional sector of the individual's father when the individual was 15. In principle, these variables do not have a direct impact on earned income, because they have nothing to do with productivity, the worker's capacities, or the type of job held. Being a head of household could create an incentive to accept a more vulnerable job when faced with urgent family needs, but it is more likely that household heads would search for a less vulnerable job to guarantee household income stability. All things equal, heads of household may adopt long-term strategies and be less drawn by immediate gains at the cost of a vulnerable job.

Another exogenous source of variation in job search can be obtained with the father's occupation when the worker was 15. The father's occupation is likely to influence the child's aversion, attraction, or resistance to job vulnerability. Let the vulnerability index I be regressed on X and Z such that

$$I = \alpha_h X + \gamma_h Z + \mu_h \; \forall h = 3,4. \tag{4.3}$$

The estimated residual from this first linear regression, $\hat{\mu}$, is introduced as an explanatory variable, controlling for unobserved heterogeneity, into the earnings equation:

$$Y_h = \beta_h X + \varphi_{1h} I + \varphi_{2h} I^2 + \lambda_h + \hat{\mu}_h + \kappa_h^{\sim} \; \forall h = 3,4. \tag{4.4}$$

The resulting estimators of $\varphi_h = (\varphi_{1h}, \varphi_{2h})$ are convergent if the model satisfies the classic identification conditions and the instruments are independent of $\hat{\mu}$ and not correlated with the earnings equation residual $\kappa_h^{\sim}$.

For all estimations, the bootstrap method (500 replications) was used to estimate the standard deviations, which are biased by the nature of the two-stage estimations.

Distributional Approach

The impact of vulnerability on earnings may differ across the earnings distribution. Quantile regressions are used to take these potential effects into account. First, equation (4.1) is reestimated using conditional quantiles, such that

$$q_\tau(Y_h | X, I, I^2) = \beta_h(\tau) X + \varphi_{1h}(\tau) I + \varphi_{2h}(\tau) I^2 \; \forall h = 3,4 \tag{4.5}$$

where $q_\tau(Y_h | X, I, I^2)$ is the τth conditional quantile of Y_h, and vector $\hat{\beta}_h(\tau)$ and the estimated coefficients $\hat{\varphi}_{1h}(\tau)$ and $\hat{\varphi}_{2h}(\tau)$ provide the effects of the different regressors at the *th* quantile of the earnings distribution in sector h.

This framework does not take selection effects into account. Whereas the control function method can also be used in the case of quantile regression, to our knowledge no models exist that can estimate quantile regressions with multinomial selection. Moreover, this distributional approach corrects only the supposed endogeneity of vulnerability. Our approach is not a major drawback, because, as shown below, the results of the quantitative approach are not sensitive to the consideration of a possible selection effect.

Results

Approach at the Mean

Table 4.4, based on models (4.1), (4.2), and (4.4), shows the marginal effects of the vulnerability indicator on earnings, calculated at the average vulnerability point.[11] Whether or not the sample selection and endogeneity of vulnerability are corrected, the marginal effect of average vulnerability is negative in both sectors for all cities except the informal sector in Dakar, where this effect is slightly positive. In both the formal private and informal sectors, the selection correction barely alters the results. However, the correction for the endogeneity

Table 4.4 Marginal Effects of Vulnerability Intensity on Earnings in Seven Cities in West Africa *(percent)*

Sector	Abidjan	Bamako	Cotonou	Dakar	Lomé	Niamey	Ouagadougou
Formal private sector							
No selection correction, exogenous vulnerability	–12.6	–13.9	–10.9	–16.2	–7.4	–14.3	–9.3
Selection correction, exogenous vulnerability	–12.5	–13.8	–10.9	–16.2	–7.0	–14.2	–9.3
Selection correction, endogenous vulnerability	–24.2	–37.3	–15.5	–33.5	–24.8	–23.0	–22.5
Number of observations	825	452	509	950	302	409	336
Average intensity	1.035	0.858	0.967	1.024	1.199	1.325	1.077
Informal sector							
No selection correction, exogenous vulnerability	–2.8	–1.3	–0.6	0.2	–0.1	–1.0	–1.7
Selection correction, exogenous vulnerability	–2.9	–1.3	–0.7	0.2	–0.3	–1.0	–1.6
Selection correction, endogenous vulnerability	–19.9	–17.2	–3.4	1.0	–13.1	–9.7	–15.6
Number of observations	2,842	2,906	3,236	3,492	2,857	2,230	2,745
Average intensity	1.661	1.801	1.757	1.959	1.960	2.229	1.787

Sources: Based on Phase 1 of the 1-2-3 surveys of selected countries (see table 4.1 for details).
Note: The marginal effect at the average point of intensity (denoted $\overline{I}$) was calculated using the following equation: $\log(y) = aI + bI^2 \Rightarrow y = \exp(aI + bI^2) \Rightarrow em(\overline{I}) = \frac{\partial y}{\partial I}(\overline{I}) = (\hat{a} + 2\hat{b}\overline{I})\exp(\hat{a}.\overline{I} + \hat{b}.\overline{I}^2)$.

of vulnerability alters the magnitude of the marginal effects. The marginal effect of vulnerability on earnings is already markedly negative before correcting for endogeneity. After endogeneity is taken into account, the impact remains negative and increases.

In the formal private sector, one additional point of vulnerability reduces income by 16–34 percent. The effect is smaller in the informal sector; if the endogeneity of vulnerability had not been taken into account, the effect would have been negligible. Once the endogeneity of vulnerability is included, vulnerability has a large impact on earnings, with one additional point of vulnerability reducing income by 3–20 percent. The marginal effect is positive only in Dakar.

These marginal effects are calculated for average vulnerability intensity. In the formal private sector, workers satisfy one in eight vulnerability criteria on average. In the informal sector, the average vulnerability point is close to 2. Hence, if we want to identify any compensating effects for higher than average vulnerability levels, we have to study the coefficients estimated for the second-degree vulnerability intensity polynomial.

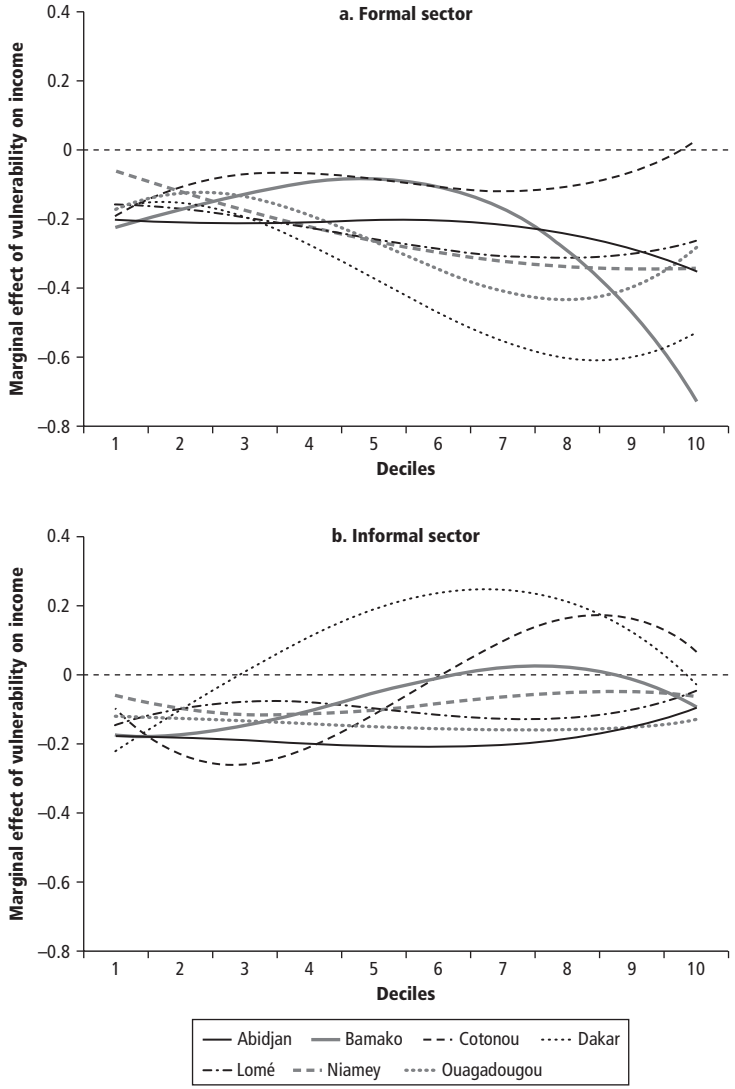
Regression results (not shown here but reflected in figure 4.1) show that, regardless of the model used, vulnerability has a negative effect on earnings in all cities except Dakar and in both institutional sectors. However, the effect of vulnerability is nonlinear and convex, as the coefficient of I^2 is positive and significant. This quadratic effect is significant at the 5 percent level, at least, and mostly at the 1 percent level in all cities and sectors except the formal private sector in Bamako, where vulnerability squared has no significant impact on earnings.

The convexity observed in the descriptive analysis holds in the formal and informal private sectors once individual characteristics, selection, and endogeneity are controlled for. It can be seen in figure 4.2, which shows the average income predicted by the Lee model with endogeneization of vulnerability by vulnerability level (the curves produced by the ordinary least squares model and the simple Lee model are similar).

In the formal private sector, earnings are convex in vulnerability intensity in all cities, albeit in a markedly decreasing manner. The curve is convex, but the slope does not change sign for low levels of vulnerability. A change of sign appears only at vulnerability levels that are not well represented in terms of the number of workers (four or more). In other words, income losses associated with vulnerability are lower for high levels of vulnerability but do not translate into gains. In Cotonou, however, the level of gains for a vulnerability level of 4 is similar to the level of gains obtained for zero vulnerability.

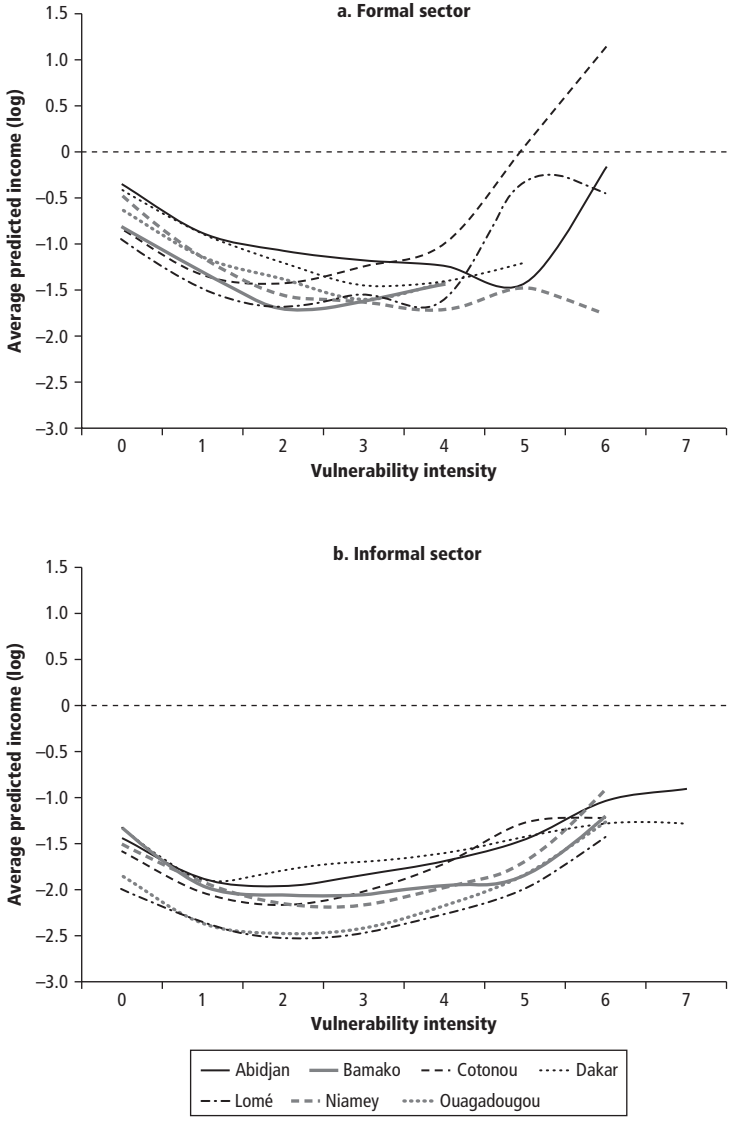
In the informal sector, convexity is observed in all cities, with the slope of the earnings curves rising above a vulnerability level of 2. In all cities, average predicted earnings for a vulnerability level of 4 or 5 are higher than average predicted earnings for a vulnerability level of 2. In Cotonou, the average predicted

Figure 4.1 **Marginal Effect of Vulnerability on Earnings in Seven Cities in West Africa, by Income Decile**



Sources: Based on Phase 1 of the 1-2-3 surveys of selected countries (see table 4.1 for details).

Figure 4.2 Average Predicted Earnings by Vulnerability Intensity in Seven Cities in West Africa



Sources: Based on Phase 1 of the 1-2-3 surveys of selected countries (see table 4.1 for details).
Note: Figure shows the Lee model with endogeneization of vulnerability.

earnings for a vulnerability level of 5 is even higher than the average predicted earnings for workers who are not vulnerable at all.

The assumption that earnings can compensate for a certain level of vulnerability therefore holds in the informal sector. More-vulnerable workers are better paid. In keeping with the theory of compensating wage differentials, this finding can be explained by the fact that employers offer higher earnings to find employees prepared to work in vulnerable jobs. For independent workers, vulnerability can be a way of earning more immediate gains from their work.

In the informal sector, the marginal effect at average vulnerability is negative in all cities except Dakar, where it is slightly positive. The average vulnerability level (about 2) is close to the minima of the convex curves. At these average points, income is a decreasing function of vulnerability. Above these points, earnings are an increasing function of vulnerability. A significant proportion of workers are above the average vulnerability level. Depending on the city, 27–62 percent of workers in the formal private sector and 38–65 percent of workers in the informal sector are more vulnerable than average.

Employers do not compensate workers for the average level of vulnerability; it is simply a feature of the job market in a particular city. Workers can negotiate wage compensation for higher levels of vulnerability. If dependent workers believe that they are more vulnerable than average, they may be in a position to negotiate premium pay. If the market imposes a certain level of vulnerability on independent workers, they will be inclined to make their job a bit more vulnerable to earn a higher income.

Distributional Approach

The distributional approach involves estimating model 4.5 for a certain number of earnings quantiles. For simplicity of presentation, we report only the series of marginal effects of vulnerability, calculated by deciles (figure 4.1). The curves presented are the third-degree trend curves, which are more flexible than the quadratic function. The marginal effects are calculated using the coefficients resulting from the quantile regressions, taking into account the endogeneity of vulnerability. In all cities, the marginal effect of vulnerability on earnings at the average vulnerability point varies depending on its position in the earnings distribution.

In the formal private sector, the marginal effect of average vulnerability is negative across the entire distribution, meaning there is no compensating mechanism in the formal private sector at the average point. The cities of Cotonou, Dakar, Lomé, Niamey, and Ouagadougou present the same concave and then convex marginal effect curves; the points of inflection are close to median earnings in the distributions. The curve in Bamako differs. It is solely concave,

reaches its maximum at the median earnings. One additional point of vulnerability is associated with a 10 percent decrease in the earnings of an individual with average vulnerability in the fifth decile of the distribution. Abidjan's curve is slightly convex at the lower tail of the distribution and then concave. The marginal effect of vulnerability on earnings varies little along the distribution (20–30 percent income loss).

In the informal sectors of Bamako, Cotonou, and Dakar the marginal effect of vulnerability along the conditional distribution of earnings is rising and mainly concave. It becomes positive as of the third decile in Dakar and as of the sixth decile in Bamako and Cotonou. Hence, for Dakar workers in the seventh decile with an average level of vulnerability, a one-point increase in vulnerability is associated with average increased earnings of 25 percent. In Cotonou, a one-point increase in the vulnerability of workers in the ninth decile with average vulnerability is associated with an average increase in earnings of 15–20 percent. In Bamako the effect is lower, but not negligible, as the increase in earnings can be as high as 5 percent for workers in the eighth decile. In the other cities (Abidjan, Lomé, Niamey, and Ouagadougou), one additional point of vulnerability is associated with no increase in earnings compared with average vulnerability, regardless of the position in the distribution. In Niamey, however, the income losses caused by a one-point increase in vulnerability are smaller for the eighth and ninth deciles.

In Dakar, Cotonou, and Bamako, the marginal effect of average vulnerability is positive for higher deciles of the earnings distribution. Dakar, Cotonou, and—to a lesser extent—Bamako display both the highest compensation for vulnerability and positive effects of vulnerability on high earnings for average levels of vulnerability. In the informal sectors of these cities, vulnerability has a different effect on earnings depending on the worker's relative position on the remuneration scale. For similar observable characteristics, workers at the lower tail of the earnings distribution (poor) are penalized in monetary terms for their vulnerability whereas workers at the upper tail of the distribution receive compensation for their vulnerability. This difference can be explained by greater bargaining power among workers at the upper tail of the earnings distribution. Dependent workers with higher skills may be in a better position to negotiate their wages. Among independent workers (the majority in the informal sector), the poorest cannot raise their income to compensate for the vulnerability of their work (by increasing the prices of goods or services they sell, for example). In contrast, independent workers at the upper tail of the earnings distribution can more easily make trade-offs between working conditions and earnings by keeping prices high. Furthermore, labor supply may well outstrip demand in low-income activity sectors. In this case, employers would not have to financially compensate workers for adverse working conditions, and own-account workers would not be able to raise their mark-up.

Conclusion

In this chapter, we develop indicators of employment vulnerability in seven West African economic capitals and study their links with individual earnings from the main job. According to the theory of compensating differentials, workers receive pecuniary compensation commensurate with the strenuous or hazardous nature of their tasks or the adverse nature of their working conditions. This chapter draws on this theory, applying it to working conditions and more broadly to vulnerability in employment (contractual insecurity, working conditions, underemployment, and stopgap jobs mismatched with individual characteristics), a dominant characteristic of urban labor markets in Sub-Saharan Africa.

Indicators of employment vulnerability in seven West African cities (Abidjan, Bamako, Cotonou, Dakar, Lomé, Niamey, and Ouagadougou) reveal that in the private sector, 83 percent of dependent workers and 86 percent of independent workers are vulnerable. These percentages mask huge differences between the formal private and informal sectors, where 98 percent of dependent and 87 percent of independent workers are vulnerable. Among workers in the private sector, 85 percent meet at least one criterion for vulnerability.

The quantitative analysis finds that the impact of vulnerability on earnings is negative for an average level of vulnerability (except in Dakar, where it is slightly positive). In the formal private sector, income losses associated with vulnerability are lower for high levels of vulnerability. In Cotonou, for example, the level of earnings for average vulnerability is close to the level of earnings obtained for zero vulnerability. In the informal sector, however, the average predicted earnings for workers with high vulnerability scores are higher than the average predicted earnings for workers with relatively low vulnerability scores. In Cotonou, the average predicted earnings for level 5 vulnerability (on a scale of 1–8) is even higher than the average predicted earnings for workers who are not vulnerable. The assumption that average earnings may compensate for a certain level of vulnerability is thus confirmed in the informal sector. This compensation or lesser-loss mechanism for high levels of vulnerability affects a significant share of workers. Average vulnerability is not compensated for; it is an inherent characteristic of the job markets in these cities.

The marginal effect is estimated through regressions on the earnings average, which conceal variations in the magnitude of the impact of vulnerability along the earnings distribution. Quantile regressions find evidence that the impact of vulnerability on earnings is not uniform, particularly in the informal sector. For example, in the informal sectors of Dakar, Cotonou, and Bamako, the marginal effect of average vulnerability is positive for the upper deciles of the earnings distribution. Dakar, Cotonou, and, to a lesser extent, Bamako display both the highest compensation for high levels of vulnerability and the positive effects of average vulnerability on earnings among the highest earnings.

For average levels of vulnerability, compensating wage differentials are found at the upper tail of the distribution. However, the compensating mechanism does not concern the poorest workers. Although the poorest dependent workers should be the most forceful in wage bargaining in an endeavor to earn a living wage, they have less bargaining power because of the urgent nature of their needs. Urban labor market imbalances could also explain this absence of compensating wage differentials at the lower tail of the distribution, where labor supply probably far exceeds demand. Similarly, the poorest independent workers suffer more from their vulnerability and do not adopt strategies to compensate for it by increasing their profits (raising receipts or reducing expenditure). An independent worker at the upper tail of the earnings distribution could more easily make trade-offs between working conditions and earnings.

Notes

1. The still-developing economic literature on vulnerability includes a range of definitions. Wilson and Ramphele (1989) define vulnerability as the risk of destitution, famine, or death. The concept of vulnerability moved forward with Sen's capability approach (1992, 1999). Cheli and Lemmi (1995) refer subsequently to exposure to the risk of poverty. Qizilbash (2003, 2006) views vulnerability as an individual's distance from an unambiguous state of poverty. Dubois and Rousseau (2001) view vulnerability in terms of the structure of "capabilities" that enables individuals to replace (or not) one capability with another in the event of an exogenous shock. The loss of a job would therefore have a greater impact on an individual with less leeway to work in different occupations and a low level of economic and social capital. The notion of vulnerability adopted in this chapter is similar to that developed by Cheli and Lemmi (1995) and Qizilbash (2006), as it remains vague about the exact level of the state of poverty and its multidimensional aspect.
2. Health hazards are not considered, because the data used did not include them.
3. However, there is not a great deal of empirical evidence to support this point. See in particular Poggi (2007) and Fernández and Nordman (2009).
4. In the more developed version of this chapter (Bocquier, Nordman, and Vescovo 2010), we used a qualitative approach, conducting a principal component factor analysis on the different aspects of vulnerability. The main components were then used as vulnerability variables. We thus relaxed the assumption that all the criteria involved in vulnerability have the same weight. Technical details on our econometric procedure, additional tables, and results are also reported in this version.
5. Although Abidjan and Cotonou are not administrative capitals, we refer to them as capitals because they are the most important economic centers in their countries (Cotonou is also the seat of government).
6. See Katz (1986) for a review of efficiency wage theories, Lindbeck and Snower (1989) for a review of insider-outsider models (labor market segmentation theory), and Akerlof and Yellen (1990) for an extended version of efficiency wage theory.

7. The studies on this issue reach conflicting conclusions. See, for example, French and Dunlap (1998); Groot and Maassen van den Brink (1998); Lanfranchi, Ohlsson, and Skalli (2002); Magnani (2002); Clark and Senik (2006); Bockerman and Ilmakunnas (2006); and Poggi (2007).
8. Not all second-job holders are vulnerable. Public and private sector wage-earners sometimes work second jobs to earn money for retirement or for their children.
9. The status hierarchy is as follows: senior executives, engineers, or equivalent; middle managers and supervisors and skilled and semi-skilled nonmanual and manual employees; unskilled workers; apprentices and family workers.
10. See Bocquier, Nordman, and Vescovo (2010) for further discussion of our identification strategies.
11. Detailed regression tables are available from the authors.

References

Akerlof, G., and J. Yellen. 1990. "The Fair Wage–Effort Hypothesis and Unemployment." *Quarterly Journal of Economics* 105 (2): 255–83.

Bockerman, P., and P. Ilmakunnas. 2006. "Do Job Disamenities Raise Wage or Ruin Job Satisfaction?" *International Journal of Manpower* 27 (3): 290–302.

Bocquier, P., C. J. Nordman, and A. Vescovo. 2010. "Employment Vulnerability and Earnings in Urban West Africa." *World Development* 38 (9): 1297–314.

Brown, C. 1980. "Equalizing Differences in the Labor Market." *Quarterly Journal of Economics* 94 (1): 113–34.

Burdett, K., and D. T. Mortensen. 1998. "Wage Differentials, Employer Size, and Unemployment." *International Economic Review* 39 (2): 257–73.

Card, D. 2001. "Estimating the Return to Schooling: Progress on Some Persistent Econometric Problems." *Econometrica* 69 (5): 1127–60.

Cheli, B., and A. Lemmi. 1995. "A 'Totally' Fuzzy and Relative Approach to the Measurement of Poverty." *Economic Note* 94: 115–34.

Clark, A., and C. Senik. 2006. "The (Unexpected) Structure of 'Rents' on the French and British Labour Markets." *Journal of Socioeconomics* 35 (2): 180–96.

Daniel, C., and C. Sofer. 1998. "Bargaining, Compensating Wage Differentials, and Dualism of the Labor Market: Theory, and Evidence for France." *Journal of Labor Economics* 16 (3): 546–75.

Dubois, J.-L., and S. Rousseau. 2001. "Reinforcing Household's Capabilities as a Way to Reduce Vulnerability, and Prevent Poverty in Equitable Terms." Paper presented at the conference "Justice and Poverty: Examining Sen's Capability Approach," Cambridge University, June 5–7.

Fernández, R. M., and C. J. Nordman. 2009. "Are There Pecuniary Compensations for Working Conditions?" *Labour Economics* 16 (2): 194–207.

French, M. T., and L. J. Dunlap. 1998. "Compensating Wage Differentials for Job Stress." *Applied Economics* 30 (8): 1067–75.

Garen, J. 1984. "The Returns to Schooling: A Selectivity Bias Approach with a Continuous Choice Variable." *Econometrica* 52 (5): 1199–218.

Groot, W., and H. Maassen van den Brink. 1998. "The Price of Stress." *Journal of Economic Psychology* 20: 83–103.

Hwang, H., D. T. Mortensen, and W. R. Reed. 1998. "Hedonic Wages and Labor Market Search." *Journal of Labor Economics* 16 (4): 815–47.

Katz, L. F. 1986. "Efficiency Wage Theories: A Partial Evaluation." In *NBER Macroeconomics Annual,* ed. S. Fisher, 1:235–90, Cambridge, MA: MIT Press.

Lanfranchi, J., H. Ohlsson, and A. H. Skalli. 2002. "Compensating Wage Differentials and Shift Work Preferences." *Economics Letters* 74 (3): 393–98.

Lee, L.-F. 1983. "Generalized Econometric Models with Selectivity." *Econometrica* 51(2): 507–12.

Lindbeck, A., and D. J. Snower. 1989. *The Insider-Outsider Theory of Employment and Unemployment*. Cambridge, MA: MIT Press.

Magnani, E. 2002. "Product Market Volatility and the Adjustment of Earning to Risk." *Industrial Relations* 41: 304–28.

Maloney, W. 2004. "Informality Revisited." *World Development* 32 (7): 1159–78.

Manning, A. 2003. *Monopsony in Motion: Imperfect Competition in Labor Markets*. Princeton, NJ: Princeton University Press.

Mortensen, D. T. 2003. *Wage Dispersion: Why Are Similar Workers Paid Differently?* Cambridge, MA: MIT Press.

Murphy, K. M., and R. Topel. 1987. "Unemployment, Risk, and Earnings: Testing for Equalizing Wage Differences in the Labor Market." In *Unemployment, and the Structure of Labor Markets*, ed. K. Lang and J. Leonard, 103–40. London: Basil Blackwell.

Pagès, N. 2003. "Hétérogénéité des systèmes d'emploi urbain et vulnérabilité au travail: application aux entreprises et aux petites unités productives en Côte d'Ivoire." Paper presented at the Third Conference on "Approaches to Capacity: From Viable Development to Durable Liberty," University of Pavia, Italy, September 8–10.

———. 2005. *Hétérogénéité du système d'emploi et développement: une application aux entreprises et aux petites unités productives urbaines en Côte d'Ivoire*, PhD diss., Université Paris X-Nanterre.

Pissarides, C. 2000. *Equilibrium Unemployment Theory*, 2nd ed. Cambridge, MA: MIT Press.

Poggi, A. 2007. "Do Satisfactory Working Conditions Contribute to Explaining Earning Differentials in Italy? A Panel Data Approach." *Labour* 21 (4–5): 713–33.

Qizilbash, M. 2003. "Vague Language and Precise Measurement: The Case of Poverty." *Journal of Economic Methodology* 10 (1): 41–58.

———. 2006. "Philosophical Accounts of Vagueness, Fuzzy Poverty Measures, and Multidimensionality." In *Fuzzy Set Approach to Multidimensional Poverty Measurement,* ed. A. Lemmi and G. Betti, 9–28. New York: Springer.

Rosen, S. 1986. "The Theory of Equalising Differences." In *The Handbook of Labor Economics,* vol. 1, ed. O. Ashenfelter and R. Layard, 641–92. Amsterdam: Elsevier Science.

Sen, A. K. 1992. *Inequality Reexamined.* Oxford, U.K.: Oxford University Press.

———. 1999. *Development as Freedom*. New York: Knopf.

Wilson, F., and M. Ramphele. 1989. *Uprooting Poverty: The South African Challenge.* New York: Norton.

Wooldridge, J. M. 2005. "Unobserved Heterogeneity and Estimation of Average Partial Effects." In *Identification and Inference for Econometric Models,* prepared under the direction of D. W. K. Andrews and J. H. Stock, 27–55. Cambridge, U.K.: Cambridge University Press.

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