The Informal Labor Market in Colombia: Identification and Characterization[*]

El mercado laboral informal en Colombia: identificación y caracterización

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Abstract

In this paper, we study the extent and nature of informality in Colombia by using the new chapter on informality in the *Encuesta Continua de Hogares* (ECH) from August 2006 to December 2006, which includes new questions deepening the information on coverage of social protection benefits, labor market trajectories, and motivations for sector of employment. The availability of these new data allows us to measure informality in several ways and understand the differences and implications of using various definitions. We show that social security contributions is a reasonable measure of informality as it is a good indicator that the individual has the entire package of benefits associated with formal employment.

We then use this definition of informality to characterize informal workers in various dimensions that include socio-demographic characteristics, characteristics of the firm and job satisfaction measures.

The main objective is to understand what types of individuals belong to formal and informal sectors, study the incentives and motivations of workers for belonging to one or other segment of the labor market, and analyze the consequences of not being covered by the regulatory framework. In doing this, we hope to gain some understanding about how different policy interventions could influence individuals' occupation choices and workers' well-being.

Key words: informality, pension, health, job satisfaction.

JEL Classification: J32, J42, J81.

Resumen

En este trabajo se estudia la naturaleza y alcance de la informalidad laboral en Colombia con base en el nuevo capítulo de informalidad de la Encuesta Continua de Hogares entre Agosto 2006 y Diciembre 2006, que incluye preguntas sobre la cobertura de beneficios de seguridad social, trayectorias laborales y motivaciones por sector de empleo. La disponibilidad de estos datos nos permite medir informalidad de diversas maneras y entender las implicaciones de utilizar definiciones diferentes. Se muestra que utilizar contribuciones a la seguridad social como una medida de informalidad es razonable dado que es un buen indicador de que el individuo tiene el paquete completo de beneficios asociado al empleo formal.

A continuación se utiliza esta definición de informalidad para caracterizar a los trabajadores formales en varias dimensiones que incluyen características socio-demográficas, características de la firma y medidas de satisfacción laboral. El objetivo principal es entender qué tipos de individuos pertenecen a los sectores formal e informal, y analizar las consecuencias de estar cubierto por el marco regulatorio. Al hacer esto, esperamos entender mejor la manera como diferentes intervenciones de política pueden influenciar las decisiones laborales de los individuos, y por tanto, su bienestar.

Palabras clave: informalidad, pensiones, salud, satisfacción laboral.

Clasificación JEL: J32, J42, J81.

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Introduction

Over the past years, much has been said about the "informalization" of the Colombian labor market. Many authors report that the number of informal workers is high and has been increasing steadily. However, understanding the extent and nature of informality is not an easy endeavor for various reasons.

First, it is not straightforward to define informality. In principle, informal employment refers to employment that goes unreported, and thus, is not covered by the regulatory framework. In particular, it is employment that evades the formal regulation, which in turn, leaves the worker unprotected and vulnerable. However, some experts have argued that the definition should, instead, focus on the overall working conditions of workers. For example, that informality should make a distinction between jobs in terms of wages, working conditions, hours of work, training possibilities, the work environment, etc. Other possible definitions, which have been widely used, include distinctions between jobs in terms of the size of the firm and/or the type of occupation (e.g. employees vs. self-employed) and economic sector. These distinctions pose some research difficulties. For instance, while the first definition based upon regulation coverage does not necessarily imply that all informal jobs are of "low quality" (in terms of working conditions, wages, training opportunities, etc.)[1], the second one based upon working conditions clearly does.

Second, the definition of informality is probably contingent on the specificities of the labor market. As labor market regulation and overall characteristics of the labor market vary significantly across countries, it is more difficult to find a generalizable definition of employment informality. Third, the scarcity of data about formal regulation coverage and more general characteristics of the jobs people hold, make it difficult to measure informality and most importantly, to compare different definitions of informality.

In this paper, we study the extent and nature of informality in Colombia by using a new source of data. In particular, we use a new chapter on

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[1] Note, however, that there will be some obvious correlations. For example, if the formal sector is legally regulated then the minimum wage is binding and therefore, wages will tend to be higher in the formal sector than in the informal sector.

informality in the *Encuesta Continua de Hogares* (ECH) from August 2006 to December 2006, which includes new questions deepening the information on coverage of social protection benefits, labor market trajectories, and motivations for sector of employment. Crucially, the availability of these new data allows us to measure informality in several ways and understand the differences and implications of using various definitions. Using these data, we show that using social security contributions as a measure of formality is sensible for various reasons that we explain in detail. Basically, it adheres to the basic concept of informality as employment that goes unreported and is not covered by the regulatory framework, it clearly identifies vulnerable workers, it is highly correlated with several other widely used definitions of informality and, as we show, is a good indicator that the individual has the entire package of benefits associated with formal employment.

We then use this definition of informality to study the nature of this phenomenon in Colombia. In particular, we characterize informal workers in various dimensions that include socio-demographic characteristics, characteristics of the firm and job satisfaction measures. The main objective is to understand what types of individuals belong to formal and informal sectors, study the incentives and motivations of workers for belonging to one or other segment of the labor market (broadly defined in terms of informality), and analyze the consequences of not being covered by the regulatory framework. In doing this, we hope to gain some understanding about how different policy interventions could influence individuals' occupation choices and workers' well-being.

This paper is organized as follows. In section I we present several definitions of informality and compare them in order to identify a definition of informality to be used throughout the rest of the paper that is comprehensive, robust, allows comparability with other international data and can be measured with other sources of data in the country. In Section II we present a comprehensive description of the informal market by characterizing segments of the labor market in terms of socio-demographic characteristics of individuals, job satisfaction measures, and characteristics of firms. Section III presents an analysis of the motivations of employees and independent workers

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and the preferences for independent work over salaried jobs. Section IV concludes.

I. Defining informality

The most common definitions of informality used in Colombia so far include: 1) the group of employees and employers working in firms with less than 10 workers, unpaid family workers, domestic household workers, and self-employed individuals who are not professionals or technicians[2]; and 2) all employment not covered by health and/ or pension contributions. Based upon these definitions, the extent of informality in Colombia has ranged from 60% to 70% over the last decade[3]. In this section, we present new definitions of informality, which is possible due to new data collected in a new chapter on informality in the *Encuesta Continua de Hogares* (ECH). We compare traditional definitions with new definitions, assess the extent of the overlap and recommend a unique definition of informality.

In doing this we keep the following criteria in mind: (1) there seems to be consensus that the definition of informality has to capture the normative dimension of employment, i.e., it should indicate whether or not the worker is covered by the legal regulatory framework; in this sense, it identifies unprotected workers in a legal sense[4]; (2) the chosen definition implies or is at least highly correlated with other possible measures of legal employment and other widely used definitions of informality; (3) allows comparability with other international data and (4) can be measured with other sources of data in the country, so that it allows comparability with other analyses of informality.

We first construct a list of twenty seven possible definitions of informality based upon the new data, which include the traditional definitions. These are summarized in Table 1. We then narrow down the choices based on basic descriptive statistics and analyze the association and extent of the overlap among a selected set of definitions.

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[2]   Formal definition of the National Department of Statistics (DANE).

[3]   See Cárdenas (2007), Gaviria (2004), Núñez (2004) and Núñez and Espinosa (2004).

[4]   Cárdenas (2007) defines informality as all employment that is not reported to official institutions. See also Núñez (2004).

Table 1.   List of definitions of informality.

Definition of Informality	Description
1	If individual makes contributions for pension
2	If individual makes contributions for health
3	If individuals makes contributions for both, pension and health
4	If individual receives Workplace Accident Insurance (ARP)
5	If individual makes contributions for pension and receives ARP
6	If individual makes contributions for health and receives ARP
7	If individual makes contributions for pension and health, and receives ARP
8	If eligible individual receives transportation subsidy
9	If individual has the right to severance pay
10	If individual has the right to paid vacation
11	If individual has the right to mid and end-of-year bonus
12	If individual receives all "main benefits"1 and all "other mandated benefits"2
13	If individual receives all "main benefits"1 and at least one "other mandated benefit"2
14	If individual receives all "main benefits"1 and transportation subsidy
15	If individual receives all "main benefits"1 and has the right to severance pay
16	If individual receives all "main benefits"1 and receives paid vacation
17	If individual receives all "main benefits"1 and receives mid and end-of-year bonus
18	If individual receives all "other mandated benefits"2
19	If individual receives at least one "other mandated benefit"2
20	If individual receives all "other non-mandated benefits"3
21	If individual receives at least one "other non-mandated benefit"3
22	If individual receives all "main benefits"1, all "other mandated benefits"2 and at least one "other non-mandated benefit"3
23	If individual receives all "main benefits"1, all "other mandated benefits"2 and all "other non-mandated benefits"3
24	If employee or employer working in a firm with 10 or less workers or works by himself4
25	If employee or employer working in a firm with 5 or less workers or works by himself
26	If individual has a formal contract
27	If individual has a formal written contract

1 "Main mandated benefits" include: i) contributions to pension, ii) contributions to health, and iii) availability of workplace accident insurance (ARP)

2 "Other mandated benefits" include: i) the right to severance pay, ii) paid vacation, iii) mid and end-of-year bonus and iv) transportation subsidy (up to 2 minimum wages)

3 "Other non-mandated benefits" include: i) family subsidy, ii) food subsidy, iii) education subsidy, iv) permanent travel expenses and v) other non-specified job benefits.

4 This definition coincides with the traditional DANE definition: the group of employees and employers working in firms with less than 10 workers, unpaid family workers, domestic household workers, and self-employed individuals who are not professionals or technicians.

Source: National Household Survey August to December (2006). Author's calculations.

The definitions detailed in Table 1 basically include the following: 1) definitions constructed based upon whether workers make social security contributions and/or whether they receive other mandated and not mandated job benefits, and combinations of these (definitions 1 through 23 in Table 1); 2) the availability of a formal contract, verbal or written (definitions 26 and 27 in Table 1); and 3) definitions constructed based upon firm size (definitions 24 and 25 in Table 1).

In constructing the categories in numeral 1) we define "main mandated benefits" to be: i) contributions to pension, ii) contributions to health[5], and iii) availability of workplace accident insurance (ARP for the spanish acronym). In addition, we define "other mandated benefits" to be: i) the right to severance pay, ii) paid vacation, iii) mid and end-of-year bonus and iv) transportation subsidy (for employees with salary less or equal than 2 minimum wages). Finally, we define "other non-mandated benefits" to be: i) family subsidy, ii) food subsidy, iii) education subsidy, iv) permanent travel expenses and v) other unspecified job benefits.

In Table 2 we present the percentage of the work force[6] that satisfies each of the definitions presented in Table 1 by area (13 metropolitan areas, urban, rural and total) for the cumulative semester total from August 2006 to December 2006. For example, the first number in the first column indicates that 39.8% of the work force in the 13 main metropolitan areas makes contributions for pension. If this is a measure of formal employment, that would imply an informal (uncovered) sector of 60.2% of the work force. Note that definition # 24 (the traditional definition of informality used by DANE[7]) indicates that approximately

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[5] For contributions to pension and health, we make the following precision: in the case of employees we require that the job they hold guarantees part or all mandatory contributions to health and pension, and in the case of employers or self-employed we require that they make contributions to health, pension or both (depending on the specific definition). The reason why we impose this requirement is that we want to make sure that we are characterizing the *job* as formal or informal, and not the individual himself. For example, if an employee has a job that does not pay contributions to health but he has health coverage to a Health Maintenance Organization (EPS for the Spanish acronym) through his spouse, then this individual has an informal job but is still covered.

[6] This includes employees, self-employed, employers, unpaid family workers and other unspecified workers.

[7] National Department of Statistics.

55% of the work force in the 13 main metropolitan areas (between August 2006 and December 2006) corresponds to employees and employers working in firms with less than 10 workers, unpaid family workers, domestic household workers, and self-employed workers who are not professionals or technicians. That means that the size of the informal sector is remarkably similar based upon a measure of social security contributions such as definition # 1 and a definition based upon occupation and firm size as the one typically used by DANE.

Table 2.   Percentage of work force by definition.

	Total Semester AUG-DEC 2006			
	13 MET	**URBAN**	**RURAL**	**TOTAL**
Work force size	8.059.897	13.003.830	4.285.034	17.288.864
inf_1	39,76	33,01	10,59	27,45
inf_2	47,02	39,82	13,31	33,25
inf_3	37,87	31,17	9,54	25,81
inf_4	36,03	29,10	7,47	23,74
inf_5	31,53	25,04	6,03	20,33
inf_6	33,16	26,52	6,47	21,55
inf_7	30,65	24,25	5,54	19,61
inf_8	22,03	16,74	2,23	13,14
inf_9	33,03	27,53	8,37	22,78
inf_10	13,07	11,51	3,44	9,51
inf_11	25,31	21,61	8,18	18,28
inf_12	4,12	3,12	0,28	2,41
inf_13	27,61	21,78	4,93	17,60
inf_14	15,84	11,77	1,43	9,21
inf_15	25,65	20,25	4,19	16,27
inf_16	9,85	8,04	1,49	6,42
inf_17	18,42	14,68	3,77	11,98
inf_18	5,11	3,97	0,40	3,09
inf_19	39,38	32,87	11,61	27,60
inf_20	0,00	0,00	0,00	0,00
inf_21	28,39	22,99	7,16	19,07
inf_22	3,58	2,68	0,23	2,07
inf_23	0,00	0,00	0,00	0,00
inf_24	54,94	61,14	86,78	67,49
inf_25	40,89	46,89	64,35	51,22
inf_26	42,96	37,40	16,48	32,21
inf_27	39,01	32,83	9,77	27,11

Definitions described in Table 1.

Work force refers to the total number of employed (excludes the unemployed).

Source: National Household Survey August to December (2006). Author's calculations.

It is clear from a preliminary glimpse at the data presented in Table 2, that some definitions are not suitable. For example, definitions # 20 and 23 (highlighted in dark grey) are clearly too strict. In particular, the number of workers that receive all "other non-mandated benefits" is zero according to the data, as is the number of workers that receive all "main mandated benefits", all "other mandated benefits" and all "other non-mandated benefits". This would imply an informal sector of 100% of the work force which is clearly implausible.

We then identify a second set of definitions (in light grey), which represent very small fractions of the work force that would also imply an implausibly large informal sector. These include definitions 12 (if individual receives all "main mandated benefits" and all "other mandated benefits"), 18 (if individual receives all "other mandated benefits") and 22 (if individual receives all "main mandated benefits", all "other mandated benefits" and at least one "other non-mandated benefit"). In particular, the percentage of the work force in each of these categories is around 2.4%, 3.1% and 2.1% respectively. Any of these would imply an informal sector of approximately 97% which is clearly unrealistic[8].

Finally, we indentify a third set of definitions (in bold), which also represent small fractions of the work force but not as low as our second set of definitions (in light grey). In particular, we include definitions 8 (individual receives transportation subsidy), 10 (if individual has the right to paid vacation), 14 (if individual receives all "main mandated benefits" and receives transportation subsidy) and 16 (if individual receives all "main mandated benefits" and has the right to paid vacation). For example, only 6.4% of individuals in the national work force receive all "main mandated benefits" and also have the right for paid vacation. This would imply that the informal sector is about 93.6%. Furthermore, this definition would imply that rural informality is about 98%, clearly too high to be reasonable. Something similar happens with definitions 10 and 14. Only about 9.5% of the national work force has the right to paid vacation and 9.2% receive "all main benefits" and

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8   I indicate that the size of informality implied by these definitions is implausibly large. More crucially, this is also a telling indicator that either labor market regulation is too ambitious and/or enforcement is poor.

also receive transportation subsidy. Both of these, would imply a total informal sector of approximately 90% of the work force.

Although less critical in terms of implied size of the informal sector, definition 8 (which includes individuals who receive transportation subsidy) might be less practical in the sense that only workers with salaries lower than 2 minimum wages are eligible for transportation subsidy. This definition would imply a total informal sector of 87% of the workforce.

The intuition that these definitions might not be suitable because of the large size of the informal sector that they would imply is reinforced by results presented in Table 3. In this Table we show statistical correlations between all the definitions of formality for semester totals at the national level[9]. The correlation between two definitions indicates the degree of linear association between the two, that is, how strongly the two definitions are linearly related. Intuitively, a high correlation between two definitions of formality indicates that an individual that satisfies one definition is highly likely to satisfy the other one as well. Thus, in a sense, these correlations provide a measure of the extent of the overlap among the different definitions presented in Table 1.

Definitions 20 and 23 are not included in Table 3 given that these are empty cells. Note that a high correlation between two definitions indicates that having a certain job benefit is a good indicator that the individual might also have the other job benefit. In addition, we expect the definitions based upon availability of job benefits to be negatively correlated with definitions 24 and 25 (based upon firm size). That is, we expect that individuals who pay social security contributions and have the right for mandated (and non-mandated) job benefits are less likely to work for small firms since these are usually thought to be part of the informal sector[10]. In other words, very low correlations would indicate that a certain definition is not a good indicator that the individual has other benefits or job characteristics associated with formal employment.

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[9] Calculations for urban and rural areas separately and month by month are also available upon request.

[10] The implicit hypothesis being that small firms are less productive than bigger firms.

Table 3. **Correlation matrix - Definitions of informality (semester, national).**

	inf_1	inf_2	inf_3	inf_4	inf_5	inf_6	inf_7	inf_8	inf_9	inf_10	inf_11	inf_12	inf_13	inf_14	inf_15	inf_16	inf_17	inf_18	inf_19	inf_21	inf_22	inf_24	inf_25	inf_26	inf_27
inf_1	1,00																								
inf_2	0,84	1,00																							
inf_3	0,97	0,87	1,00																						
inf_4	0,77	0,74	0,77	1,00																					
inf_5	0,85	0,73	0,85	0,92	1,00																				
inf_6	0,79	0,79	0,82	0,95	0,93	1,00																			
inf_7	0,83	0,75	0,86	0,90	0,98	0,95	1,00																		
inf_8	0,57	0,52	0,57	0,53	0,55	0,54	0,55	1,00																	
inf_9	0,82	0,74	0,82	0,73	0,76	0,73	0,75	0,59	1,00																
inf_10	0,50	0,46	0,49	0,43	0,45	0,44	0,44	0,31	0,55	1,00															
inf_11	0,67	0,63	0,67	0,59	0,61	0,59	0,60	0,46	0,74	0,63	1,00														
inf_12	0,28	0,25	0,29	0,31	0,33	0,32	0,34	0,42	0,31	0,50	0,35	1,00													
inf_13	0,78	0,70	0,81	0,85	0,93	0,90	0,94	0,58	0,80	0,47	0,64	0,36	1,00												
inf_14	0,56	0,50	0,58	0,60	0,66	0,64	0,67	0,83	0,56	0,28	0,42	0,51	0,71	1,00											
inf_15	0,75	0,67	0,78	0,82	0,89	0,86	0,90	0,55	0,83	0,46	0,63	0,37	0,96	0,67	1,00										
inf_16	0,46	0,42	0,48	0,50	0,55	0,53	0,56	0,29	0,48	0,82	0,52	0,61	0,59	0,35	0,58	1,00									
inf_17	0,64	0,57	0,66	0,69	0,75	0,73	0,77	0,43	0,66	0,53	0,80	0,44	0,82	0,53	0,80	0,65	1,00								
inf_18	0,31	0,27	0,31	0,28	0,29	0,28	0,29	0,48	0,35	0,56	0,40	0,88	0,31	0,44	0,33	0,53	0,38	1,00							
inf_19	0,82	0,76	0,81	0,73	0,74	0,73	0,73	0,67	0,90	0,57	0,80	0,28	0,78	0,56	0,75	0,46	0,64	0,32	1,00						
inf_21	0,72	0,66	0,72	0,65	0,68	0,66	0,68	0,56	0,77	0,50	0,70	0,29	0,71	0,52	0,70	0,45	0,64	0,32	0,78	1,00					
inf_22	0,26	0,23	0,27	0,28	0,31	0,30	0,31	0,39	0,29	0,46	0,33	0,93	0,33	0,47	0,35	0,56	0,41	0,82	0,26	0,32	1,00				
inf_24	-0,04	0,03	-0,06	-0,04	-0,06	-0,05	-0,07	-0,02	-0,07	-0,04	-0,03	-0,03	-0,08	-0,05	-0,08	-0,06	-0,07	-0,03	-0,02	-0,05	-0,03	1,00			
inf_25	-0,08	-0,01	-0,09	-0,07	-0,09	-0,08	-0,09	-0,06	-0,10	-0,06	-0,07	-0,04	-0,10	-0,08	-0,10	-0,06	-0,09	-0,04	-0,08	-0,08	-0,04	0,84	1,00		
inf_26	0,77	0,73	0,77	0,70	0,70	0,69	0,69	0,54	0,82	0,47	0,64	0,26	0,69	0,49	0,69	0,41	0,56	0,29	0,80	0,68	0,24	0,01	-0,06	1,00	
inf_27	0,82	0,76	0,82	0,74	0,75	0,73	0,74	0,57	0,86	0,50	0,67	0,28	0,74	0,53	0,74	0,44	0,60	0,31	0,83	0,72	0,26	-0,07	-0,11	0,91	1,00

Definitions described in Table 1.

Source: National Household Survey August to December (2006). Author's calculations.

We begin by focusing attention on cells highlighted in light grey (second set of definitions discussed above) and bolded cells (third set of definitions discussed above). Indeed, we observe that definitions 12, 18 and 22 are not very correlated with some of the other plausible candidates such as paying contributions for pension (definition 1), paying contributions for health (definition 2) and paying both (definition 3). Note that the correlations between the light gray definitions and definitions 1 to 3 are not larger than 0.31. For example, the degree of correlation between definition 18 (receives all "other mandated benefits") and definition 1 (makes contributions to pension) is only 0.31. This means that receiving all "other mandated benefits" is not very indicative of whether the worker makes contributions to pension or not. Something similar happens when we look at the correlation between the light gray definitions and other definitions of formality (based upon firm size or the availability of a contract). In particular, these almost never exceed 0.5. This implies that these definitions are not good indicators of whether the worker has other benefits or job characteristics associated with formal employment[11].

Something similar happens with bolded definitions (8, 10, 14 and 16). Although correlations between these and some of the other definitions are higher than those we observed in the case of the light gray group, these are still only in the range of 0.5 to 0.6 in most cases. For example, in the case of definition 10 (individuals with right to paid vacation), the correlation with the definitions based upon social security contributions (definitions 1 to 3) is at most 0.5. Notably, definitions 10, 14 and 16 not only show a low degree of correlation with definitions that are related to social security contributions but are not very correlated with the definitions based upon the existence of a written or verbal contract (definitions 26 and 27) either.

In the case of definition 8 (individual receives a transportation subsidy) correlations are higher and almost always higher than 0.5. However,

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[11] Note that, by construction, some of the light gray definitions are highly correlated among each other. For example, the degree of correlation between definition 12 and 22 is 0.93 because obviously both include individuals who receive all "main mandated benefits" and all "other mandated benefits". However, what we emphasize is that correlation with all other definitions is not high and in some cases actually very low, which does not make them very good candidates as standard definitions of informality.

as we have mentioned before the fact that this particular mandated benefit only applies for workers with salaries less than 2 minimum wages makes it a less appealing option.

Finally we have highlighted in yellow, the row and column corresponding to definition 3 (the individual makes contributions to pension and health). This definition seems very suited to measure formal, legally recognized employment, in the sense that it should capture whether or not the employee has a job tied to a typical set of rights and benefits guaranteed by the legal framework. As can be observed in Table 2, around 26% of the national work force, or about 4 million 5 hundred thousand workers, pay contributions to pension and health. This would imply a national informal sector of around 74% which seems reasonable when compared to the traditional measure of informality based upon firm size (67.5% using definition 24)[12].

It is important to make some clarifications about these numbers before proceeding. First, informality rates typically made public or presented in recent research refer to calculations based upon the *ENH* usually for 7 main cities instead of the national total. As can be observed in Table 2, measures of *formal* employment in rural areas are significantly lower than in urban areas. For example, while 38% of workers in the main 13 metropolitan areas make contributions to both, health and pension, only about 10% do so in rural areas. Note that this would imply an informal sector of about 62% in the 13 main metropolitan cities (very much in line with informality rates usually published based upon the official definition used by DANE). However, when we refer to national totals, this rate is significantly higher due, in particular, to the inclusion of the rural sector. Second, there seems to be some evidence of seasonality in employment reports over the year. Informality numbers typically reported in the literature correspond to calculations based upon the second quarter of the year (April to June). Given that in this paper we use a chapter only available from August 2006 to December 2006, this might also explain the fact that our informality rates are slightly higher than those typically available.

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[12] Note that definition #3 of formal employment is that which pays contributions to both, health and pension. The complement is considered informal work. Thus, informal workers are those who pay contributions to only one of the two (health or pension) or those who do not pay either.

In Table 3 we observe that definition 3 (makes contributions to pension and health) is highly positively correlated with all definitions related to the availability of job benefits, mandated or not (i.e., definitions 1 and 2, and 4 to 21) and also very highly correlated with definitions 26 and 27 which indicate whether the individual has a formal (written or verbal) contract. These correlations fluctuate between 0.66 (with definition 17 -all "main mandated benefits" and end-of-year bonus) and 0.97 (with definition 1 -contributions to pension). In addition, it is also negatively correlated with the definitions that use firm size (definitions 26 and 27) as expected[13].

Interestingly, the correlations of definition 3 with all the others are stronger (either negative or positive depending on the definition against with which it is compared) than in the case in which the definition refers to contribution to pension <u>only</u> (definition 1) or contribution to health <u>only</u> (definition 2)[14]. This implies that making contributions to both, pension and health, is a better indicator that the individual holds a job tied to a typical set of rights and benefits guaranteed by the legal framework than making making contributions to pension alone or making contributions to health alone[15].

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[13] The correlations of definition 3 with other potential definitions of formality defined on the basis of availability of job benefits is almost always stronger than that of definition 27 based upon the existence of a written contract. For example, making contributions to pensions and health is more strongly correlated with having workplace accident insurance, end-of-year bonus, receiving all main benefits plus severance pay, etc. than having a written contract. However, the latter is more strongly negatively correlated with firm size than definition 3.

[14] See correlations reported in column 1 and column 2 relative to numbers reported in column 3.

[15] In Appendix 1 and 2 we present a similar table of correlations among different definitions of formal employment for the urban and rural area separately. As expected, urban areas resemble quite closely the national results. However, rural correlations exhibit some significant differences. Most notably, correlations among definitions that imply the availability of job benefits are significantly lower than in urban areas, definition 3 (contributions to health and pension) is basically uncorrelated with definitions based upon firm size and its correlation with whether the individual has a contract (written or verbal) is significantly lower than in urban areas. Also, in Appendix 3, we show correlations of definitions of formal employment with a measure vulnerability, in particular, if an individual has a wage lower than the minimum wage. As expected, the correlation between formality (e.g., making contributions to health and/or pension) and vulnerability is negative. That means that a worker covered by formal job benefits is less likely to be vulnerable. In addition, these correlations are quite important ranging from -0.3 to -0.54.

Another potential candidate, defintion 9 (individual has the right to severance pay), also exhibits high correlations with other other definitions. In other words, having the right to severance pay also seems to be a good indicator that the individual holds a job with other mandated and non-mandated legal benefits, works for a large firm and has a formal contract. However using severance pay as a measure of formal employment has a few disadvantages: i) information about the right to severance pay is not readily available in other sources of data different than the chapter in the *ECH* that we analyze in this paper, ii) the use of this definition would limit comparability with international data given that definitions related to social security contributions have been widely adopted in other countries, and iii) it would imply a size of the national informal sector that is higher; for example, using this definition, the informal rate in the 13 main metropolitan areas would be around 72%, 17.5 percentage points higher than the official definition used by DANE[16] and 10 percentage points higher than our most preferred definition based upon social security contributions[17].

Interestingly, the correlation between definitions associated with job benefits and the definition based upon firm size (definitions 24 and 25) is negative, as expected, but not that strong. In particular, that correlation ranges from -0.02 to -0.09 (compared with correlations above 0.25 among other definitions presented in Table 3). That would imply that a worker that receives a given benefit, say pension, is less likely to work for a small firm but that negative correlation is not as big as one would have expected.

Finally, in Table 4a we present additional evidence that making contributions to pension and health is a very good indicator of the availability of other mandated job benefits. In particular, we show the fraction of the work force that receives a given mandated benefit (row) that also receives one of the other mandated benefits (column). The first column shows the percentage making contributions to pension and health that also have each of the other benefits. For example, 78.4% of those who make contributions to pension and health also also have ARP (Work-

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[16]   Total informality in the 13 main metropolitan areas according to the traditional definition used by DANE is 55% (see definition 24 in Table 2).

[17]   The size of the informal sector in the 13 main metropolitan areas implied by definition 3 is 62% (see Table 2).

place Accident Insurance) and 78.2% also have the right to severance pay. These numbers clearly indicate that making contributions to pension and health seems to be a good indicator that the individual has the entire package of benefits associated with formal employment. Crucially, almost 86% of individuals who make contributions to both health and pension also have a formal written contract.

Table 4.
A. Percentage of work force that receives benefit "A" that also receives benefit "B"

| | | BENEFIT A | | | | | | | | |
		Pension and Health	Pension	Health	ARP	Trans-porta-tion	Seve-rance	Paid Vaca-tion	End-of-year bonus	Written Con-tract
BENEFIT B	Pension and Health	100,00	94,03	77,63	83,01	83,39	88,66	85,81	83,19	81,52
	Pension	100,00	100,00	77,63	85,87	85,92	91,55	88,67	85,72	84,59
	Health	100,00	94,03	100,00	91,05	88,66	93,00	91,19	88,98	87,64
	ARP	78,41	74,06	64,82	100,00	75,18	76,75	72,65	70,82	71,75
	Transporta-tion	42,47	41,14	35,05	41,74	100,00	46,58	39,48	41,58	41,84
	Severance	78,24	75,96	63,71	73,84	80,73	100,00	87,98	84,54	80,29
	Paid Vaca-tion	31,62	30,73	26,09	29,19	28,57	36,74	100,00	47,00	31,08
	End-of-year bonus	58,90	57,08	48,91	54,68	57,82	67,83	90,30	100,00	57,47
	Written Contract	85,56	83,49	71,41	82,10	86,23	95,49	88,50	85,19	100,00
% workforce receiving benefit		25,81	27,45	33,25	23,74	13,14	22,78	9,51	18,28	27,11

Work force refers to the total number of employed (excludes the unemployed).

B. Percentage of informal workers by dane definition that receives benefit.

| | BENEFIT | | | | | | | | |
	Pension and Health	Pension	Health	ARP	Trans-portation	Seve-rance	Paid Vaca-tion	End-of-year bonus	Written Contract
DANE definition	7,01	8,13	14,16	7,26	4,38	5,56	2,32	5,53	6,77
DANE but <= 5 workers	4,48	5,59	11,75	4,84	2,18	2,89	1,42	3,52	3,53

See description of definitions in Table 1.

In addition, Table 4b shows the fraction of informal workers according to the definition based upon firm size (using 10 and 5 workers as threshold respectivley) that receives the benefit described in each

column. For example, the first number in the first column, indicates that 7.1% of informal workers according to DANE definition make contributions to both, health and pensions. As expected, workers in firms with less than 5 employees are much less likely to receive legal job benefits than workers in firms with less than 10 employees. There is however, an important fraction of workers in the latter category that do receive paid mandated benefits. In fact, around 14% of these workers do make contributions for health. This point reinforces the result presented in Table 3 according to which, although there is a correlation between informality by firm size and informality by social security contributions, it is not as strong as expected[18].

In sum, it seems reasonable to define formality by whether or not the individual makes contributions for pension and health for the following reasons:

(1) it adheres to this basic concept of informality as employment that goes unreported and thus, leaves the worker unprotected as it is not covered by the regulatory framework;

(2) this definition based upon social security coverage identifies vulnerable workers which are naturally of interest to public policy;

(3) we showed that making contributions to pension and health is highly correlated with some of the other definitions of formality including all others associated with the availability of job benefits, the existence of a written contract, and definitions associated with firm size which have been widely used in the country;

(4) results presented in Table 4 also indicated that making social security contributions is a good indicator that the individual has the entire package of benefits associated with formal employment;

(5) one can easily use other sources of data[19] to measure informality based upon this definition;

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[18] Mondragón, Peña and Wills (2009) show that the informal sector by firm size captures the bulk of the informal sector by social security contributions. For example, 38.7 percentage points of the 43.7% considered informal under the contributions to health definition in 2002 turn out to be classified as informal according to the definition by firm size. Thus, they use the latter to study the evolution of informality and its association to labor market rigidities.

[19] For example, Fedesarrollo's Social Survey.

(6) it easily allows comparability with international data given that informality definitions based upon social security contributions have been widely adopted in other countries.

This definition implies a national informal sector of around 74% of the work force in 2006. As can be observed in Table 2, the fraction of formal employment (measured by definition 3) in 13 main metropolitan areas is 37.8%, in urban areas it is 31.2% and in rural areas it is around 10%, which implies an informal sector of 62% in the 13 main metropolitan areas, 69% in urban areas and 90% in rural areas.

II. Characterization of the informal sector

In this section, we present a preliminary characterization of the work force and, in particular, the informal sector in Colombia based on the definition of informality described in Section I. We first show the extent of informality by segment of the work force and then proceed to analyze the determinants of informal work in terms of socio-demographic characteristics, characteristics of the firm and measures of job satisfaction and motivation. The main objective is to understand what types of individuals belong to formal and informal sectors, and study the incentives and motivations of workers for belonging to the formal or informal sector of the labor market.

We start by presenting the distribution of the working-age population by occupation. In the case of the working force we treat formal and informal working individuals as different categories. These results are shown in Table 5. Around 56.7% of the working-age population is economically active either working or looking for a job. The fraction of working-age adults that work is approximately 50%. The fraction of unemployed is around 6.8%. Finally, the fraction of economically inactive adults is 43.2%[20].

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[20] Using data from the 2005 Census, we calculate these fractions and obtain that 56% of the working-age population are economically active, of which 49% are working and 7.2% are unemployed; and 44% are economically inactive (including students and other inactive individuals).

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Table 5. Composition of Working-Age Adults (% of Working-Age Population)

a. By Category (number and % of working-age population)

Area	Economically Active									Economically Inactive		Total
	Unemployed	Formal Employee	Informal Employee	Formal Self-employed	Informal Self-employed	Formal Employer	Informal Employer	Unpaid	Other	OLF, student	OLF, not a student	
13 MET Areas	1.169.622 (7,41)	2.781.408 (17,63)	2.178.548 (13,81)	208.375 (1,32)	2.500.962 (15,85)	62.486 (0,40)	288.521 (1,83)	203.090 (1,29)	19.281 (0,12)	2.402.447 (15,23)	3.985.118 (25,26)	15.799.858 (100)
Urban	1.944.555 (7,52)	3.710.012 (14,36)	3.686.770 (14,27)	268.063 (1,04)	4.512.522 (17,46)	75.000 (0,29)	464.445 (1,80)	428.119 (1,66)	40.888 (0,16)	4.003.746 (15,49)	6.721.197 (26,01)	25.855.317 (100)
Rural	427.925 (4,69)	391.089 (4,29)	1.655.275 (18,16)	15.372 (0,17)	1.638.722 (17,98)	2.436 (0,03)	245.268 (2,69)	325.492 (3,57)	11.380 (0,12)	1.496.865 (16,42)	2.905.783 (31,88)	9.115.607 (100)
National	2.372.480 (6,78)	4.101.101 (11,73)	5.342.045 (15,28)	283.435 (0,81)	6.151.244 (17,59)	77.436 (0,22)	709.713 (2,03)	753.611 (2,15)	52.268 (0,15)	5.500.611 (15,73)	9.626.980 (27,53)	34.970.924 (100)

b. Total (% of working-age population)

Area	Economically Active			Informality Rate
	Unemployed	Formal work force	Informal work force	
13 MET Areas	7,41	19,34	32,77	0,63
Urban	7,52	15,68	35,18	0,69
Rural	4,69	4,49	42,40	0,90
National	6,78	12,76	37,05	0,74

Source: National Household Survey August to December (2006). Author's calculations.

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In panel (a) we present the distribution of economically active and inactive individuals, by category, by area[21]. Note that we do not split up unpaid workers into formal and informal in the table. The reason is that according to our definition of formality less than 4% of unpaid workers have a job that guarantees part or all the contributions to health and pension. Given that the category of unpaid workers is already small (only about 4% of all working individuals and 2% of the working-age population) then separately characterizing formal and informal individuals does not seem extremely relevant especially from the policy perspective. In addition, the fact that they are unpaid places them already in a very vulnerable position. Thus, we classify *all* unpaid workers as informal employment.

The results indicate that around 2% of the working-age population corresponds to unpaid workers. Around 27% (of working-age individuals) are employees, of which 15.3% are formal workers and 11.7% are informal[22]. Close to 17.6% of the working-age population are informal self-employed while less than 1% report to be formal self-employed. This implies a rate of informality of around 95% among self-employed. A rate of formality of only about 5% seems quite small. However, we think it is important to understand the motivations of this 5% of self-employed individuals for contributing to the social security system. Self-employment amounts to a total 18.4% of the total working-age population, which is more than two-thirds of total paid employees in the country. Thus, it seems important in terms of policy to study this fraction of formal individuals.

Approximately 2% (of working-age individuals) correspond to informal employers and only about 0.22% are formal employers. This means that the rate of informality among employers is about 90%. In spite of the low fraction of formal employers, from the policy point of view, it seems relevant to understand the motivations of this 10%; especially since this analysis could provide some interesting insights about motivations for informality from the firm side.

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[21] We do not show the category of "other unspecified worker". These correspond to approximately 0.15% of the working-age population.

[22] This implies that approximately 56% of employees are informal.

All these categories amount to a total 50% of working individuals as a fraction of the working-age population. Out of these, 12.7% correspond to formal working individuals and 37% correspond to informal working individuals[23]. This would amount to an informality rate of around 74% as reported in Section I. In panel (b) we summarize total informality rates by area. The tabulations reported in Table 5 also indicate that 6.8% of the working-age population or 12% of the economically active population is unemployed. Finally, around 43.3% of the working-age population is economically inactive. Out of these, 15.7% are students and the remainder 27.5% corresponds to individuals out of the labor force who are not students either.

A. Socio-demographic and firm characteristics that determine the likelihood of informality

In this section we present a characterization of workers in the informal sector. In doing this, we hope to gain some understanding about the type of individuals that belong to each labor market category. We look at socio-demographic characteristics of workers and households as well as characteristics of the firm or economic sector to which they belong. Showing descriptive statistics in these variuos dimensions is informative[24] about how *each* characteristic is correlated with the likelihood of being an informal worker, but they cannot tell us what its partial effect on informality is (i.e., holding other characteristics constant), nor can they reveal the relative importance of the different characteristics in determining the probability of working in the informal labor market. They cannot provide a convenient way to examine interactive effects of different characteristics, either. To address these issues, we proceed to multivariate analysis and implement a logistic regression of the probability of being an informal worker on a set of explanatory variables. The results are presented in Table 6. In column (1) we include only socio-demographic characteristics of workers as possible determinants of the probability of being an informal worker; in column (2) we add characteristics of the firm to the logit model.

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[23] That is, 35% informal paid workers plus 2.15% unpaid workers all of which we classify as informal as we explained above.

[24] Comprehensive descriptive statistics are available upon request.

Table 6.   Determinants of the probability of being an informal worker (marginal effects - evaluated at means).

Dep. Var->Pr (informal=1)	National without firm controls		National with firm controls		National, excludes workers <15 yrs		Urban		Rural	
					Sample					
I[Male]	-0,0230 (0,0019)	***	-0,0099 (0,0013)	***	-0,0256 (0,0021)	***	-0,0121 (0,0026)	***	0,0002 (0,0011)	
I[Age 15 - 18]	-0,9319 (0,0009)	***	-0,9409 (0,0013)	***	0,1286 (0,0017)	***	-0,9223 (0,0010)	***	-0,9974 (0,0006)	***
I[Age 19 - 24]	-0,9871 (0,0003)	***	-0,9906 (0,0009)	***	0,0779 (0,0022)	***	-0,9873 (0,0004)	***	-0,9990 (0,0003)	***
I[Age 25 - 44]	-0,9989 (0,0001)	***	-0,9995 (0,0001)	***	0,0234 (0,0024)	***	-0,9993 (0,0002)	***	-0,9867 (0,0020)	***
I[Age 45 +]	-0,9989 (0,0000)	***	-0,9998 (0,0001)	***			-0,9996 (0,0001)	***	-0,9979 (0,0005)	
I[Head]	-0,0934 (0,0053)	***	-0,0467 (0,0057)	***	-0,1035 (0,0058)	***	-0,0513 (0,0069)	***	-0,0079 (0,0022)	***
I[Spouse]	-0,0704 (0,0070)	***	-0,0051 (0,0059)		-0,0778 (0,0077)	***	-0,0033 (0,0071)		-0,0056 (0,0039)	
I[Child]	-0,0612 (0,0063)	***	-0,0078 (0,0058)		-0,0679 (0,0070)	***	-0,0085 (0,0069)		-0,0002 (0,0021)	
I[Grandchild]	-0,0346 (0,0115)	***	0,0198 (0,0082)	**	-0,0383 (0,0127)		0,0250 (0,0098)	**	-0,0013 (0,0064)	
I[Other Relative]	-0,0498 (0,0076)	***	0,0036 (0,0061)		-0,0551 (0,0083)	***	0,0057 (0,0073)		-0,0007 (0,0028)	
I[Urban]	-0,0601 (0,0027)	***	-0,0166 (0,0046)	***	-0,0674 (0,0031)	***				
I[Primary Education]	-0,1151 (0,0128)	***	-0,0765 (0,0118)	***	-0,1270 (0,0140)	***	-0,1039 (0,0171)	***	-0,0033 (0,0012)	***
I[Secondary Educaction]	-0,2344 (0,0116)	***	-0,1350 (0,0106)	***	-0,2574 (0,0124)	***	-0,1680 (0,0140)	***	-0,0071 (0,0023)	***
I[College]	-0,5549 (0,0176)	***	-0,2735 (0,0185)	***	-0,5791 (0,0172)	***	-0,3210 (0,0228)	***	-0,4064 (0,0127)	***
I[Indigenous]	0,0543 (0,0052)	***	0,0545 (0,0051)	***	0,0609 (0,0059)	***	0,0605 (0,0069)	***	0,0058 (0,0009)	***
I[Afro-colom-bian]	0,0182 (0,0031)	***	0,0225 (0,0032)	***	0,0203 (0,0035)	***	0,0264 (0,0039)	***	0,0024 (0,0010)	**
I[Lowest Income Quintile]	0,1177 (0,0017)	***	0,1082 (0,0018)	***	0,1322 (0,0018)	***	0,1237 (0,0021)	***	0,0151 (0,0019)	***
I[Independent or other]&	0,3265 (0,0026)	***	0,1681 (0,0030)	***	0,3547 (0,0026)	***	0,1915 (0,0034)	***	0,0268 (0,0029)	***
I[2 - 5 workers firm]			-0,0400 (0,0039)	***			-0,0482 (0,0034)	***	-0,0022 (0,0012)	*
I[6 - 10 workers firm]			-0,1858 (0,0081)	***			-0,2162 (0,0091)	***	-0,0094 (0,0031)	***
I[11 - 19 workers firm]			-0,3130 (0,0105)	***			-0,3510 (0,0110)	***	-0,0217 (0,0064)	***
I[31 or more workers firm]			-0,4097 (0,0073)	***			-0,5450 (0,0071)	***	-0,0895 (0,0168)	***

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Table 6.   Determinants of the probability of being an informal worker (marginal effects - evaluated at means) (*continued*).

Dep. Var->Pr (informal=1)	National without firm controls	National with firm controls		National, excludes workers <15 yrs		Urban		Rural	
I[Agriculture]		0,0446 (0,0141)	***			0,0559 (0,0159)	***	-0,0020 (0,0053)	
I[Manufacturing]		0,0173 (0,0182)				0,0256 (0,0217)		-0,0070 (0,0124)	
I[Private Services]		0,0108 (0,0197)				0,0183 (0,0237)		-0,0067 (0,0114)	
I[Public Services]		0,0005 (0,0205)				0,0068 (0,0240)		-0,0111 (0,0163)	
I[Transportacion/ Communication]		0,0039 (0,0200)				0,0097 (0,0237)		-0,0041 (0,0102)	
I[Construction]		0,0537 (0,0120)	***			0,0673 (0,0145)	***	0,0010 (0,0053)	
I[Retail]		-0,0018 (0,0206)				0,0037 (0,0246)		-0,0110 (0,0152)	
Sample	Work force	Work force							
Max Likelihood Function	-42.978	-34.951				-33.525,00		-1.359,84	
Number of obs.	119.670	119.670				109.596		10.066	
Pseudo-R2	0,3737	0,4907				0,4822		0,4760	

& Excluded category: employees

0,1170
0,238434889

The results indicate that men are around one percentage point less likely to be informal workers than women (see column 2). As expected, older workers (any age) are less likely to be informal workers than the youngest (less than 15 years of age, the excluded category) given that all workers younger than 15 are actually informal. For that reason, the probability of working in the informal labor market declines almost entirely with an increase in age with respect to the youngest (close to 100 percentage points). Note that with the exception of workers between 15 and 18 years of age, the effects of age do not change much. In column (3) we present additional results in which we exclude all workers younger than 15 from the sample[25]. Thus, the excluded category is now workers older than 45 years of age. The likelihood of

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[25]   All workers younger than 15 are informal and thus the dummy I[age < 15] cannot be included in the regression. However, using I[age < 15] as the excluded category produces strange results as we have discussed.

being an informal worker is higher for younger workers with respect to workers older than 45. For example, workers between the ages of 25 and 44 years of age are 2.3 percentage points more likely to be informal than those older than 45, while younger workers between the ages of 15 and 18 are almost 13 percentage points more likely to be informal than the oldest.

The head of the household is almost 5 percentage points less likely to be an informal worker than other non-relatives that reside in the household. The spouse of the head of the household and children of the head of the household are also less likely to be informal workers than other non-relatives in the households. However, this difference is significantly smaller. For example, the spouse of the head of the household is half percentage point less likely to be an informal worker than non-relatives. On the other hand, grandchildren living in the household are actually more likely than non-relatives to work as informal workers. In particular, it is almost 2 percentage points more likely that they work in the informal labor market.

Urban workers are 1.6 percentage points (6 percentage points if one does not control for characteristics of the firm) less likely than rural workers to be informal. More educated workers are significantly less likely to be informal than workers with no education. This effect is stronger, the highest the education level of the individual. For example, individuals with primary education are 7.6 percentage points less likely to be informal workers than individuals with no education while workers with college education are 27 percentage points less likely to be informal with respect to uneducated workers.

Ethnic minorities (afro-colombian and indigenous) are more likely to be informal workers than white/mestizos. In particular, an indigenous worker is 5.4 percentage points more likely to be informal than a white/mestizo and an afro-colombian worker is about 2.2 percentage points more likely to be informal. Workers in the lowest income quintile are 10 percentage points more likely to be informal workers than the rest[26]. In addition, independent workers (self-employed, employers

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[26] It is important to note, however, that informal **employees** are almost equally likely to belong to any of the five income quintiles. The probability that an informal employee belongs to the bottom two quintiles is just as big as the probability that she belongs to the upper three

and others) are nearly 17 percentage points more likely to be informal workers than employees.

The next set of explanatory variables refer to characteristics of the firm, rather than the individual, and in particular, the economic sector and the size of the firm. Note that the incremental R-squared is about 0.1170 (out of a total R-squared of 0.49), that means that individual characteristics seem to be more quantitatively important than firm characteristics in explaining the likelihood of informality. The results indicate that the likelihood of being an informal worker decreases with the size of the firm. For example, individuals that work for firms with 2 to 5 workers are 4 percentage points less likely to be informal than workers that work on their own and workers in firms with more than 30 workers are 41 percentage points less likely to be informal than workers that work on their own.

However, it is important to note that that nearly 17% of formal employees are actually affiliated to firms with 10 workers or less and around 24% of informal employees work in firms with more than 10 workers. This is interesting in the sense that it suggests that although there is a high correlation between making contributions to social security and working in small firms, it is not necessarily the case that all informal workers work in small firms and vice versa, thus using the size of the firm to measure informality might be inaccurate. In addition, if employment in small firms is usually associated with less human capital investment opportunities, fewer promotion possibilities, and sometimes worse working conditions, then this result also suggests that not all informal employment is precarious as some informal employment takes place in large firms and not all formal employment is of better quality as a significant fraction takes place in small firms.

Other results in Table 6 indicate that workers in the agriculture sector and workers in the construction sector are significantly more likely to

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(48.5% vs. 51.5%). In other words, there is no strong evidence that informal employees are particularly concentrated in the lower tail of the income distribution. However, it is significantly more likely to belong to the bottom three quintiles conditional on being an informal **self-employed** worker than to the upper tail of the distribution (60% vs. 40%).

be informal workers than workers in the "other" sectors[27]. For example, workers in the agriculture sector are 4.5 percentage points more likely to be informal than workers of other sectors and those in the construction sector are 5.3 percentage points more likely to be informal than those in other sectors. Interestingly, there does not seem to be a statistically signficant difference in the probability of being informal if the worker belongs to any of the other sectors, including retail and manufacturing.

In columns (4) and (5) we present results of the model for urban and rural areas separately. Some of the results are quite interesting. Working men are significantly less likely than women to be informal only in urban areas. However, gender is not statistically significant in explaining the probability of being an informal worker in rural areas. The effect of age on the probability of being an informal worker is similar in urban areas and rural areas. In both, urban and rural areas, the head of the household is significantly less likely to be an informal worker with respect to other non-relatives in the households. However, the effect is significanlty bigger in urban areas than in rural areas. In particular, the head of the household is 5 percentage points less likely to be informal than other non-relatives in urban areas while in rural areas the head is less than one percentage point less likely to be informal. In addition, grandchildren of the head of the household are more likely to be informal than other non-relatives but only in urban areas.

Tertiary education has a very big effect on the probability of being an informal worker both in urban and rural areas. For example, college-educated workers are 32 percentage points less likely to be informal than uneducated workers in urban areas and 40 percentage points less likely in rural areas. Note, however, that although primary and secondary education also reduce the probaiblity of being an informal worker, this effect is very small in rural areas compared with urban areas. For example, workers with primary education are 10 percentage points less likely than uneducated workers to be informal in urban areas while this effect is only about 0.3 percentage points in rural areas. That means that in rural areas, only college educated workers are significantly

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[27] In other words, workers that belong to a sector different from the seven sectors specified in the table.

less likely to be informal while primary and secondary education only marginally decreases the probability of informality.

Ethnic minorities are significantly more likely to be informal with respect to whites and mestizos in urban areas than in rural areas. For example, while an indigenous worker is 6 percentage points more likely to be informal than a white or mestizo worker in urban areas this effect is only about 0.6 percentage points in rural areas. Poverty has a much bigger effect on informality in urban areas than in rural areas. Workers that belong to households in the lowest income quintile are 12 percentage points more likely to be informal in urban areas while this effect is only about 1.5 percentage points in rural areas. Similarly, working independently is quantitatively more important in explaining the probability of informality in urban areas than in rural areas. In particular, independent workers are 19 percentage points more likely (than all other workers) to be informal in urban areas while in rural areas this effect is around 2.6 percentage points.

The next set of variables refer to characteristics of the firm, rather than the individual. As informality is a much more widespread phenomenon in rural areas than in urban areas, something similar to what we just documented occurs in the case of characteristics of the firm, i.e., the effects of these variables in rural areas on the likelihood of being an informal worker are quantitatively much smaller than in urban areas. Note for example that the effects of the size of the firm on the likelihood of being informal are significantly lower in rural areas. A worker affiliated to a large firm with more than 31 workers is about 54 percentage points less likely to be an informal workers than an individual that works by himself in urban areas. However, this effect is only about 9 percentage points in rural areas.

The economic sector is only significant in explaining the likelihood of informality in urban areas while it does not turn out to be a significant explanatory variable in the case of rural areas. In particular, workers in the agriculture sector and the construction sector are significantly more likely to be informal workers than workers in "other" sectors in urban areas. For example, a worker in the agriculture sector is 5.5 percentage points more likely to be an informal worker in urban areas and a worker in the construction sector is about 6.7 percentage points

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more likely to be an informal worker than an individual working in all "other" sectors.

Finally, we present some descriptive statistics about average labor earnings by labor market segment in Table 7. Note that about 84% of the total working population have monthly earnings equivalent to two minimum wages or less. In particular, 28.7% earn less than half a minimum wage, 20% earn something between half a minimum wage and one minimum wage and finally, 35.7% earn between one and two minimum wages. About 8.6% of the working population earn more than five minimum wages per month. Note that although our definition of informality is not constructed based upon labor earnings, most formal workers (in any of the three categories) do, in fact, have labor earnings above the minimum wage as one would expect. For example, only about 4.6% of formal employees have monthly labor earnings that fall below one minimum wage.

Table 7.   Labor earnings by labor market segment (national) (% by row).

Segment	Labor Earnings						
	<1/2 MW	1/2 MW- 1MW	1MW - 2MW	2MW-3- MW	3MW-4- MW	4MW-5- MW	> 5MW
Total employed	28,7	20,0	35,7	4,8	1,9	0,4	8,6
Formal Self-employed	5,5	9,0	45,5	13,1	7,3	1,3	18,4
Informal Self-employed	43,6	24,3	18,3	2,1	0,8	0,1	10,8
Formal Employer	2,4	2,8	18,0	8,6	10,9	1,1	56,2
Informal Employer	11,9	14,6	35,9	8,0	4,4	0,4	24,9
Formal Employee	1,0	3,6	71,2	11,7	4,2	1,0	7,2
Informal Employee	36,3	29,1	28,2	1,7	0,7	0,2	3,8

Source: National Household Survey August to December (2006). Author's calculations.

The distribution of monthly earnings varies significantly across labor market categories. First of all, as expected, there are differences between formal and informal workers for almost every category. In

particular, the distribution of labor earnings for informal workers is more skewed to the left than the distribution for formal workers. For example, 60% of formal self-employed workers earn two minimum wages or less while about 86% of informal self-employed workers do. On the other hand, the fraction of formal self-employed workers that earn more than five minimum wages per month is around 18% while the fraction of informal self-employed workers that do is only about 10%. Employers tend to have higher earnings, but informal employers earn less than formal employers. In particular, about 77% of formal employers earn more than two minimum wages every month while only about 37% of informal employers do. Note that most formal employees (about 71%) earn between one and two minimum wages every month. Approximately 65% of informal employees earn less than that.

B. Job satisfaction

In Table 8 we present the distribution of individuals by job satisfaction variables, for each segment within the economically active population. These variables are based upon several self-reported answers to questions regarding the perception of the worker about his job/occupation. First, we look at the distribution of individuals by segment of the work force by perception of underemployment. In other words, by whether the individual wishes to work more hours or not. The first row of the table indicates the fraction of the total working population that gave a certain response to each of the job satisfaction questions. For example, the first number in the first row indicates that 19% of all employed individuals wish to work more hours.

Note that in every case, informal workers (whether they are self-employed, employers or employees) are more likely to report that they would like to work more hours than formal workers. For example, approximately 24% of informal self-employed workers would like to work more hours while 16% of formal self-employed would. Similarly, 20% of informal employees wish to work more hours while 11% of formal employees do. Also note that the likelihood of reporting underemployment is higher among informal self-employed than among any other type of worker. Unpaid workers also have a high perception of underemployment, in particular, about 20% of them report they wish to work more hours.

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Table 8. Characterization of the working-age population by segment (National). By Job Satisfaction. (% by row)

	Wish to work more hours		Desire to change jobs		How satisfied are you with your job			How stable is the job				Compatibility of job with family responsibilities			
Segment	Yes	No	Yes	No	Very Satisfied	Satisfied	Not satisfied	Very unstable	Unstable	Stable	Very Stable	Very incompatible	Incompatible	Compatible	Very Compatible
Economically Active															
All employed	19,0	81,0	39,0	61,0	5,5	74,8	19,7	4,7	34,7	57,4	3,2	1,6	11,4	84,2	2,7
Formal Self-employed	16,7	83,3	31,1	68,9	12,1	75,3	12,6	6,3	35,2	56,5	2,0	1,9	16,1	79,3	2,7
Informal Self-employed	24,6	75,4	44,9	55,1	2,9	72,6	24,5	6,5	44,1	48,2	1,3	1,4	9,6	86,2	2,9
Formal Employer	3,7	96,3	7,5	92,5	23,7	72,4	3,9	4,1	10,1	70,7	15,1	0,4	10,4	83,5	5,8
Informal Employer	9,9	90,1	20,4	79,6	10,2	81,6	8,2	1,8	24,5	69,0	4,8	0,9	8,3	86,6	4,2
Formal Employee	11,0	89,0	23,3	76,7	11,6	81,6	6,9	2,1	15,1	74,6	8,1	1,8	12,3	82,9	2,9
Informal Employee	19,9	80,1	47,3	52,7	3,2	71,5	25,2	5,0	41,2	52,3	1,5	1,9	14,0	82,0	2,1
Unpaid	19,8	80,3	41,3	58,7	1,7	72,7	25,6	4,0	30,4	64,3	1,3	1,3	4,7	90,9	3,1

Reasons for wanting to change jobs (not mutually exclusive)									
Segment	Under-utilized	Increase income	Work less hours	Current is temporary	Problems at work	Dislike current job	Too demanding	Environment issues	Other
Economically Active									
All that want to change	51,3	97,0	28,7	39,5	6,5	22,3	39,2	17,0	6,4
Formal Self-employed	64,0	91,9	29,3	44,7	5,6	16,8	38,0	14,0	10,8
Informal Self-employed	46,3	97,8	24,7	39,6	6,4	22,4	38,9	17,6	5,9
Formal Employer	71,6	87,0	40,8	8,2	21,4	25,9	38,9	1,9	17,8
Informal Employer	44,6	94,2	32,5	22,6	8,5	15,6	49,2	22,6	4,1
Formal Employee	62,2	94,3	36,1	24,6	7,4	19,3	43,9	21,6	7,8
Informal Employee	51,3	97,0	31,3	46,6	6,4	23,8	38,7	15,4	6,0
Unpaid	61,2	94,4	19,7	33,1	3,7	24,2	27,6	10,5	7,3

Source: National Household Survey August to December (2006). Author's calculations.

One proxy for job satisfaction is the question regarding the desire to change jobs. Employers, formal and informal, are among the most highly satisfied with their occupation. In particular, 93% of formal employers report they do not wish to change jobs and 80% of informal employers do. Informal workers, regardless of whether they are self-employed, employers or employees, are generally more likely to be dissatisfied with their job/occupation than their formal counterparts. For example, 47% of informal employees report they would like to change jobs while 23% of formal employees do. Similarly, 45% of informal self-employed express a desire to change jobs while 31% of formal self-employed workers do. The results also indicate that informal employees are the most dissatisfied type of workers (measured by the desire to change jobs) followed by informal and formal self-employed. Interestingly, most workers seem to be satisfied with their job/occupation (61%).

In the lower panel of Table 8 we show tabulations of the reasons why people report they want to change jobs conditional on actually wanting to change jobs, by segment of the labor force. These reasons are not mutually exclusive, and thus the total by row does not add up to 100. Among all workers who report wanting to change jobs, most declare they want to do so because they would like to increase their income (97%). Other important reasons include the fact that the worker feels under-utilized (51%), the current job is temporary (40%) and the job is too demanding (39%).

Interestingly, the likelihood of wanting to leave a job due to low wages is not significantly different between formal and informal employees. In particular, while 97% of informal employees report that would like to change jobs in order to increase their income, about 95% of formal employees do. This difference is higher, though, in the case of self-employed workers and employers. For example, 92% of formal self-employed workers report they would like to change jobs to increase their income and 98% of informal self-employed do. Yet, this difference is not too big which suggests that the evidence does not strongly point out to informal jobs being much worse in this sense.

Also very interesting, is the fact that formal workers are more likely to feel under-utilized in their current job than informal ones. For example,

62% of formal employees who report they would like to change jobs indicate that the reason is they feel under-utilized in their current job while 51% of informal employees that want to change jobs do. The difference is even bigger between formal and informal employers (71% vs. 44%). In addition, formal workers are also more likely to report that they work too many hours and for that reason they would like to change jobs than informal workers. For example, 36% of formal employees who want to change jobs report that this is the reason why and 31% of informal employees who would like to change jobs do. Both of these facts suggest that working conditions in informal jobs are not necessarily worse than in formal jobs. In this case, formal workers are more likely to feel under-utilized and feel they work too many hours than informal workers.

Something similar happens when we look at "job too demanding" as a possible reason for wanting to change jobs. Formal and informal self-employed workers as equally likely to report this as a reason for wanting to leave, formal employees are actually more likely than informal employees to do so and only in the case of employers is there a difference in favor of formal employers. An important reason for informal workers compared to formal workers to want to change jobs is the fact that their current occupation is temporary. For example, 46% of informal employees report this as a reason for wanting to change jobs while 24% of formal employees do. In sum, although informal workers are more likely to report they would like to change jobs, it seems like the leading reason is the fact their job is temporary, and not other reasons related to the perception of worse working conditions in the informal sector.

Next we present in Table 8 the answers to the question about the level of satisfaction with the current job/occupation. Most individuals indicate they are satisfied regardless of the labor market segment, even unpaid workers. In particular, 72% of unpaid workers report to be satisfied while only 25% report they are not satisfied with their job. Yet, the degree of satisfaction seems to be correlated with informality status in the labor market. In every case, individuals are more likely to be dissatisfied and less likely to be very satisfied with their job if they are informal workers than if they are formal workers. For example, 25% of informal employees report to be dissatisfied and only 3.2% indicate

they are very satisfied with their job, while 6.9% of formal employees are dissatisfied and nearly 12% are very satisfied with their job. Yet again, employers seem to be highly satisfied with their occupation and more so than other occupational categories. Only 3.6% of formal employers report they are not satisfied with their job and nearly 24% report to be very satisfied.

In the next panel of the Table we characterize segments of the work force by perception of the worker about the stability of her job. Self-employed workers, formal or not, and informal employees have a higher perception of job instability than all other workers. In particular, 42% of formal self-employed, 50% of informal self-employed and 45% of informal employees report that their job is either unstable or very unstable compared with only 13.5% in the case of formal employers and 17% of formal employees.

There is a clear difference between formal and informal workers in terms of perception about job stability, with informal workers reporting higher job instability in every case. For example, while 46% of informal employees report their job is either unstable or very stable only about 17.3% formal employees do. Similarly, 26% of informal employers indicate their job is unstable or very unstable and only 13.6% of formal employers do. Formal employers and formal employees have more generally a good perception about the stability of their job than any other worker. In particular, 86% of formal employers and 83% of formal employees report their job is either stable or very stable. Interestingly, about 64% of unpaid workers indicate their job is stable while only 30% think it is unstable.

Finally, we report differences in the perception about how compatible is the current job/occupation with family responsibilities by segment of the work force. Most individuals in the work force think their job is compatible or very compatible with family responsibilities, with this fraction being 87%. A higher fraction of unpaid workers report their job is compatible or very compatible than in any other segment. Notably, there are no significant differences between formal and informal workers except perhaps in the case of self-employed. In this case, a higher fraction of informal self-employed think their job is compatible or very compatible with their daily family responsibilities than in the case of formal self-employed (89% vs. 82%).

In sum, we could say that although there are some important differences between formal and informal workers in terms of job satisfaction, most of the reasons why this is the case are related to the perception that informal jobs are unstable and/or temporary and less so to reasons associated with worse working conditions, such as, significantly lower pay, under-utilization of the worker, the job being too demanding or working too many hours.

III. Motivations of workers

The new chapter about informality in the *ECH* includes questions about the motivations of individuals to be a certain type of worker instead of another one. For example, it asks about the reasons why the individual is an employee instead of a self-employed worker. Similarly, it inquires about the reasons for working independently instead of as an employee. In this section we analyze these motivation questions and assess whether they vary by labor market segment and by socio-demographic characteristics of individuals. By studying the incentives and motivations of workers for belonging to one or other segment of the labor market we hope to gain some understanding about how different policy interventions could influence individuals' occupation choices and workers' well-being.

A. Motivations of employees for not working as self-employed

In Table 9 we show the distribution of individuals' motivations to work as employees rather than as self-employed workers, by segment of the labor market. In addition, we cross these answers with selected socio-demographic characteristics of workers (by column). The results indicate that the most common response among employees is that the individual lacks the resources to be able to be an independent worker (36.5% of employees). This fraction is remarkably similar when comparing formal employees with informal ones (35% vs. 37%) –although still statistically significantly different. The ranking of reasons varies significantly by type of employee, i.e., formal vs. informal. For the former, the lack of resources to work as independent is the leading reason (35%) followed by the availability of social security benefits

(21.5%) and the fact that this was the only job the individual could find (18%). In the case of informal workers, the main reason to be an employee instead of a self-employed worker is that this was the only job the individual could find (45%), followed by the lack of resources to work independently (37%) and at a very distant third the fact that being independent is too unstable (6%).

The results reported in the same panel by row percentages confirm these results. It is significantly more likely that individuals indicating that the reason why they are employees and not self-employed is because this was the only job they could find are informal than formal (76% vs. 24%). Something similar happens when the reason associated with being an employee is that it implies lower work loads and less responsibility (63% informal vs. 37% formal) and when it is due to lack of resources to work independently (58% informal vs. 42% formal). For all other motivations, it is more likely to be a formal employee conditional on that response that an informal employee. For example, 61% of individuals who respond that being independent is too unstable are formal employees while 39% are informal. Similarly, 88% of individuals who indicate that they work as employees due to the availability of social security benefits are actually formal employees while only 12% are informal. Interestingly, the distribution of

Table 9.   Motivations of employees for not being self-employed (national).

Motivation	% by column			% by row	
	Employees	Formal employee	Informal employee	Formal employee	Informal employee
Only job she could get	33,5	17,9	45,3	23,7	76,3
Independent work is too unstable/needs fixed income	8,4	11,8	5,9	61,0	39,1
Better opportunities of being promoted as employee	4,7	7,7	2,5	70,5	29,6
Higher pay as employee	2,3	2,8	2,0	52,7	47,4
Availability of social security benefits	10,6	21,5	2,3	88,0	12,0
Lack of resources to work as independent	36,5	35,1	37,6	42,3	57,7
Lower work loads and less responsibility	0,9	0,7	1,0	37,6	62,5
Other	3,0	2,5	3,4	36,4	63,6

t-tests for mean differences are significant at 1% in all cases.

Table 9. Motivations of employees for not being self-employed (national) *(continued)*.
Motivations by socio-demographic characteristics. (% by column)

Panel by sex

Motivation	Formal Men	Formal Women	Informal Men	Informal Women
Only job he/she could get	18,3	17,4	46,2	43,8
Independent work is too unstable/needs fixed income	11,4	12,3	5,8	6,2
Better opportunities of being promoted as employee	7,7	7,6	2,3	2,8
Higher pay as employee	3,1	2,5	2,3	1,5
Availability of social security benefits	19,9	23,7	1,9	3,0
Lack of resources to work as independent	36,6	33,1	37,5	37,8
Lower work loads and less responsibility	0,6	0,9	0,9	1,0
Other	2,5	2,5	3,2	3,8

Panel by education

Motivation	Formal None	Formal Primary	Formal Secondary	Formal College	Informal None	Informal Primary	Informal Secondary	Informal College
Only job he/she could get	29,1	24,3	20,7	12,9	59,8	48,9	43,6	31,1
Independent work is too unstable/needs fixed income	7,2	8,6	11,0	13,7	5,5	4,8	6,0	9,6
Better opportunities of being promoted as employee	1,6	3,7	6,0	10,7	1,0	1,4	2,5	7,3
Higher pay as employee	3,5	1,6	2,4	3,6	2,0	1,5	2,0	3,5
Availability of social security benefits	8,6	16,8	18,4	26,3	0,5	0,8	2,2	8,6
Lack of resources to work as independent	42,4	43,7	39,5	27,8	28,9	39,1	39,6	30,5
Lower work loads and less responsibility	-	0,5	0,6	0,9	0,2	0,9	1,0	1,5
Other	7,6	0,8	1,3	4,1	2,2	2,7	3,0	8,0

Panel by age

Motivation	Formal <15 yrs	Formal 15-18	Formal 19-24	Formal 25-44	Formal >45	Informal <15 yrs	Informal 15-18	Informal 19-24	Informal 25-44	Informal >45
Only job he/she could get	-	44,1	24,1	16,9	16,6	63,7	58,3	47,3	42,8	43,9
Independent work is too unstable/needs fixed income	-	5,7	9,5	12,2	12,2	0,9	2,9	5,2	6,6	6,3
Better opportunities of being promoted as employee	-	2,4	5,0	7,7	9,1	0,2	1,5	2,3	2,7	2,8
Higher pay as employee	-	0,2	1,7	3,0	3,0	0,8	1,2	2,1	1,9	2,3
Availability of social security benefits	-	5,6	14,5	20,4	28,2	-	0,6	1,4	2,6	3,0
Lack of resources to work as independent	-	39,3	41,3	37,0	27,2	16,2	29,4	37,5	39,6	37,1
Lower work loads and less responsibility	-	-	1,2	0,7	0,6	2,7	1,8	0,9	1,0	0,6
Other	-	2,7	2,7	2,2	3,2	15,5	4,4	3,4	2,8	3,9

Panel by area

Motivation	Formal Urban	Formal Rural	Informal Urban	Informal Rural
Only job he/she could get	22,4	17,4	52,5	41,9
Independent work is too unstable/needs fixed income	6,4	12,4	4,0	6,9
Better opportunities of being promoted as employee	6,6	7,8	1,7	2,9
Higher pay as employee	2,4	2,9	1,8	2,1
Availability of social security benefits	16,2	22,1	0,8	3,0
Lack of resources to work as independent	42,7	34,3	36,0	38,4
Lower work loads and less responsibility	0,5	0,8	1,1	0,9
Other	2,7	2,5	2,3	4,0

Panel by quintile

Motivation	Formal Quintile 1	Formal 2	Formal 3	Formal 4	Formal 5	Informal Quintile 1	Informal 2	Informal 3	Informal 4	Informal 5
Only job he/she could get	24,7	22,7	20,0	16,5	15,0	56,4	45,1	43,2	41,0	35,7
Independent work is too unstable/needs fixed income	9,9	10,4	10,9	11,6	13,2	3,5	5,3	6,0	7,3	9,2
Better opportunities of being promoted as employee	9,9	4,1	6,8	6,7	10,5	0,9	2,1	2,3	3,0	5,5
Higher pay as employee	3,0	2,2	1,9	2,5	3,9	1,2	2,0	1,7	2,3	3,2
Availability of social security benefits	18,6	15,9	20,0	21,9	25,0	0,5	1,5	1,7	3,8	5,6
Lack of resources to work as independent	30,4	43,4	38,5	37,6	27,5	34,5	40,7	40,7	37,7	33,3
Lower work loads and less responsibility	1,0	0,8	0,5	0,6	1,0	0,3	0,9	1,2	1,3	1,4
Other	2,5	0,7	1,4	2,6	4,0	2,8	2,3	3,3	3,7	6,1

Source: National Household Survey August to December (2006). Author's calculations.

responses between formal and informal workers is actually very close in the case of reporting a higher pay as the reason why they are not self-employed but rather employed. In particular, 53% of individuals who indicate this is the reason why they are employed are formal while 47% are informal. This is, in fact, the motivation for which the difference between formal and informal employees is lower, although as we have mentioned is not one of the most important reasons reported by workers in general.

These results indicate important differences between informal and formal employees' motivations. In sum, formal employees are mainly motivated to be employees by the fact that they do not have the resources necessary to work independently and because working as employees guarantees social security benefits and more stability (yet, the fact that this was the only job they could get is still an important motivation). On the other hand, informal employees are mainly driven to be employees because they did not have any other alternative or because they did not have resources to work independently.

In the lower panel of Table 9 we cross these motivations with selected socio-demographic characteristics of workers (by column). Note that the ranking of motivations by gender remains the same, both for formal and informal employees. However, formal men are more likely than women to respond they work as employees because they lack the resources to work independently. On the other hand, formal women are more likely than men to prefer employment over self-employment because of the availability of social security benefits. In the case of informal workers, more men are likely to report that they are employees because that was the only job they could find than women (46% vs. 44%).

Second, we report the motivations by age of the worker. The most reported reason for being an employee instead of a self-employed worker among the oldest (45 years of age or more) formal workers is the availability of benefits (28.2%) followed by the lack of resources to be able to work independently (27.2%). In addition, it is not as likely (compared with younger people) to report that the reason is they could not find any other job (only 16% of older formal employees). For formal employees between the ages of 25 and 44 the lack of resources to

work as independent is the most reported reason (37%), followed by the availability of social security benefits (20%) and the fact that they could not find another job (17%). For younger formal workers between the ages of 19 and 24, the lack of resources to work independently is still the most reported reason and the fact that they could not find another job is the second one (24%). Finally, the ranking of answers among the youngest formal workers resembles quite closely that of informal employees. In particular, most of them report that the reason they are employees instead of self-employed workers is that they did not find any other job (44%). In second place they report the lack of resources for working independently (39%) and at a distant third the fact that it is more stable than independent work (5.7%). Only about 5.6% report they work as employees due to the availability of social security benefits.

Among informal workers the picture is slightly different. Informal workers are likely to report the fact that they could not find another job as the most important reason why they work as employees and not as self-employed workers at all ages, and as expected, the fraction decreases with age. For example, 64% of workers younger than 15 report this is the reason why they are not self-employed while 44% of informal employees older than 45 do. The lack of resources to work independently comes in second place at every age.

Additional results in Table 9 indicate that formal urban employees are more likely to report that they work as employees due to the fact that they lack the resources to work independently (43%) than formal employees in rural areas (34%) and informal employees (36% in urban areas and 38% in rural areas). Also, urban workers (both formal and informal) are more likely to report that they work as employees because they could not get another job than in rural areas (e.g., 22% vs. 17% in the case of formal workers), while urban employees are more likely to indicate they do so due to the availability of social security benefits than rural employees (e.g., 22% vs. 16% in the case of formal workers).

The availability of social security benefits seems to be a more important reason to work as employee for more educated workers than for less educated ones. For example, 26% of formal workers with a college

degree indicate this is the reason why the do not work independently while 8.6% of uneducated formal employees do. Something similar happens among informal workers. On the other hand, it is significantly more likely that uneducated workers report they are employees because they did not find another job (29% of formal employees with no education and 60% of informal employees with no education) than more educated ones (13% among formal college workers and 31% among informal ones).

Finally, we turn to the distribution of motivations by income quintile. Note that the fraction of people that report they work as employees rather than being self-employed because they could not find another job decreases with income. For example, 24.7% of formal employees in the lowest income quintile report this is the reason why they do not work independently while 15% in the highest income quintile do. Something similar happens among informal workers except the fractions are higher than for formal employees. On the other hand, the fraction of people reporting that they work as employees due to the availability of social security benefits increases with income (both among formal and informal workers). For example, 16% of formal employees in the second income quintile report this as a reason to work as employees, 22% in the fourth income quintile do and 25% in the highest income quintile. Interestingly, there is no clear pattern between reporting higher pay as a reason to work as employee by income, and again, the fraction of people reporting this as a reason is not significantly different between formal and informal employees.

In sum, the availability of social security benefits does not appear to be the most important reason to be employed rather than working independently, especially among some type of workers. Other reasons, such as, the lack of resources to work independently or not having been able to find a different job seem more relevant. Also interestingly, differences in pay do not seem to account for a large fraction of the choices. In a sense, this hints to the presence of labor market barriers which are, in turn, associated with individuals not being able to allocate to their most preferred segment.

B. Motivations of independent workers for not working as employees

In Tables 11 through 13 we show the distribution of individuals' motivations to work as independent workers (self-employed, employers, others) instead of employees, by segment of the labor market. In addition, we cross these answers with selected socio-demographic characteristics of workers. The results in Table 10 (% by column) indicate that the most prevalent answer among independent workers is that this was the only job they could find (approximately 51% of all independent workers report this as they reason why they work independently), followed by the worker's age (22%) and the fact that the worker is used to working independently (16%). In addition, about 14% of independent workers indicate that more flexible hours is a key factor and 11.5% report it is the availability of higher pay.

The results also indicate interesting differences between self-employed workers and employers. Most self-employed workers, both formal and informal, report that the reason why they are self-employed instead of employees is that this was the only job they could find (about 46.7% of formal self-employed and 54.8% of informal ones)[28]. On the other hand, around 24% of informal employers do (this is still the most reported reason among informal employers) and only about 8.9% of formal ones indicate that this is the reason why they work independently. In the case of employers, a more important motivation turns out to be the availability of higher pay. In particular, 36% of formal employers report this motivation while 22.5% of informal employers do. The life cycle as a reason to work independently does not make it in the top 3 list of reasons (as was the case for self-employed workers). For formal employers, reasons like better prospects (19.5%), whishes to own her/his own business (18.5%), and being used to independent work (15.1%) turn out to be more important than age (10.6%). In the case of informal employers being used to working independently comes in third (20.7%) and the worker's age comes in fourth (19%).

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[28] Perry et al (2007) document that self-employed workers in most Latin American countries work independently mostly by choice while self-employed workers in Colombia seem to be excluded from the formal sector.

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Table 10.   Motivations of independent workers for not working as employees (national).

Motivation	Independent workers	Formal self-employed	Informal self-employed	Formal employer	Informal employer	Other independent
Was fired and has not found another job	4,6	9,9	4,7	1,8	2,0	3,6
Only job he/she could get	51,0	46,7	54,8	8,9	23,9	61,5
Higher pay	11,5	19,9	9,6	36,0	22,5	2,0
More flexible hours	13,8	14,4	13,8	14,3	13,1	14,5
Due to his/her age	22,3	19,7	22,9	10,6	19,2	21,0
More stability or better future	2,7	4,9	1,9	15,1	6,8	2,2
Better prospects	5,1	7,9	4,1	19,5	10,9	1,3
Wishes to own his/her own firm	5,6	6,8	4,6	18,5	13,4	1,0
Less responsibility	2,3	0,7	2,4	0,9	2,7	4,6
Does not like having a boss	9,1	6,6	8,6	15,5	13,8	4,4
Family tradition	6,2	1,0	5,7	5,3	12,3	6,9
Inherited the business	1,6	0,7	1,3	1,7	4,6	1,3
Is used to working independently	15,8	9,7	15,6	15,1	20,7	7,0
Other reasons	10,0	7,6	10,4	4,4	6,0	29,4

Total by column does not add up to 100 since individuals may give up to two answers.

In sum, answers like better prospects, more stability, wishes to own his/her own firm, family tradition and a low preference for having a boss are significantly more prevalent among employers than among self-employed workers. On the other hand, reports of working independently due to the worker's age and because was previously fired and could not find another job are more prevalent among self-employed than employers.

There are also some interesting differences between formal and informal independent workers. Formal independent workers are more

likely to report higher pay, more stability and better prospects as reasons for working independently than informal workers. On the other hand, informal independent workers are more likely to report they work independently because this was the only job they could find, due to his/her age, because it implies less responsibility, for family tradition, an inherited business and because he/she is used to working independently than formal workers.

1.   Motivations of self-employed workers

Next we present in Table 11, how these motivations for self-employment vary by selected socio-demographic characteristics of workers by tabulating column percentages. The most prevalent reason, for both men and women, to work as self-employed workers instead of employees is that they could not find another job. However, informal women are more likely to indicate this is the reason than formal men (52.5% vs. 42.7%) while formal men and women are equally likely to respond this (54.9% vs. 54.6%). A higher fraction of women than men indicate that more flexible hours is an important reason for working as self-employed. In particular, 19.7% of formal women vs. 13% of formal men and 21.4% of informal women vs. 9% of informal men report this is the reason why they work independently.

Self-employed workers older than 45 are almost equally likely to report that they work independently due to their age than to report they do because this was the only job they could find. For example, 33.6% of formal self-employed workers indicate it is because of their age and 37% because this was the only job they could find. Similarly, 41% of informal self-employed workers respond it is due to their age and 48.8% report it is because they could not find another job. Age seems to be an important factor for the youngest workers as well. For example, 85.4% of formal self-employed workers between the ages of 15 and 18 and 26.5% of informal self-employed workers in the same age range report they work independently due to their age. Younger workers (except the youngest) are also more likely to indicate that they work independently because they could not find another job than older ones.

Workers between the ages of 25 and 44 are more likely to report flexible hours as a reason to work independently than workers in any other age

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Table 11.   Motivations of self-employed workers by socio-demographic characteristics (% by column).

Motivation	Formal		Informal		Formal					Informal					Formal		Informal	
	Men	Women	Men	Women	<15 yrs	15-18	19-24	25-44	>45	<15 yrs	15-18	19-24	25-44	>45	Urban	Rural	Urban	Rural
Was fired and has not found another job	10,7	8,7	5,2	3,9	-	-	6,4	9,2	11,0	0,0	1,2	3,6	5,4	4,4	9,5	17,2	5,6	2,4
Only job he/she could get	42,7	52,5	54,9	54,6	-	14,6	55,1	54,8	36,9	56,1	68,7	68,6	57,4	48,8	47,0	42,0	52,7	60,6
Higher pay	20,1	19,7	11,5	6,6	-	-	19,4	21,7	18,1	1,3	2,7	8,9	11,7	7,9	20,1	16,6	10,5	7,2
More flexible hours	12,9	16,5	9,0	21,4	-	-	15,4	16,9	11,5	16,9	14,0	16,3	17,2	9,8	14,3	15,7	14,7	11,5
Due to his/her age	21,6	17,0	21,2	25,6	-	85,4	0,2	8,9	33,6	32,2	26,5	2,3	9,1	41,0	20,1	13,3	24,0	19,9
More stability or better future	4,5	5,4	2,2	1,6	-	-	3,8	6,0	3,8	-	0,6	1,3	2,5	1,5	4,4	13,0	2,0	1,7
Better prospects	8,9	6,5	4,6	3,3	-	-	9,3	7,1	8,7	0,8	0,8	4,1	5,3	3,0	8,3	1,9	4,4	3,3
Wishes to own his/her own firm	8,7	4,1	4,6	4,6	-	-	1,8	7,8	6,2	0,3	3,8	4,3	5,8	3,4	7,0	4,0	4,8	4,1
Less responsibility	0,9	0,4	2,2	2,6	-	-	0,6	0,9	0,4	2,4	3,4	2,8	2,5	2,1	0,7	0,0	2,1	3,0
Does not like having a boss	7,5	5,3	9,8	6,8	-	-	5,5	6,9	6,3	4,2	4,8	8,1	9,8	7,7	6,6	6,2	8,4	9,3
Family tradition	1,2	0,7	7,0	3,8	-	-	1,0	0,2	1,9	8,1	4,4	5,3	4,8	6,8	0,9	3,4	3,3	12,5
Inherited the business	1,1	0,0	1,7	0,8	-	-	3,5	0,5	0,5	0,2	0,8	1,4	1,3	1,5	0,4	5,1	0,7	3,2
Is used to working independently	11,0	7,7	18,2	11,5	-	-	15,6	7,0	12,1	0,8	3,9	11,3	15,5	17,3	9,4	14,7	14,2	19,6
Other reasons	7,4	7,9	9,1	12,6	-	-	6,0	7,4	8,0	15,7	17,3	13,2	11,1	8,8	6,9	20,6	10,4	10,5

Motivation	Formal				Informal				Formal					Informal				
	None	Primary	Secondary	College	None	Primary	Secondary	College	Quintile 1	2	3	4	5	Quintile 1	2	3	4	5
Was fired and has not found another job	-	5,5	9,7	10,2	2,6	3,5	5,6	8,3	22,2	9,5	7,8	8,3	9,9	3,5	4,1	5,5	5,5	4,8
Only job he/she could get	15,4	44,9	43,8	49,3	60,1	58,0	54,9	41,1	38,9	56,3	55,1	55,4	42,8	63,1	61,8	59,1	52,0	37,9
Higher pay	68,4	12,8	22,8	19,7	4,3	7,4	11,4	17,0	2,3	2,7	11,1	10,7	26,4	3,8	4,8	8,0	11,3	20,1
More flexible hours	3,1	8,1	15,3	15,3	6,1	10,7	17,0	21,5	9,2	20,1	15,7	11,0	15,3	11,2	12,3	13,1	14,0	18,7
Due to his/her age	8,9	38,0	22,8	14,7	34,2	27,2	18,2	15,9	26,0	14,3	27,1	27,5	16,0	28,2	25,8	19,6	20,7	20,7
More stability or better future	-	4,2	3,2	6,0	0,7	1,7	2,0	4,0	2,4	16,9	0,4	2,1	5,9	1,3	1,0	1,7	2,4	3,2
Better prospects	-	5,5	6,4	9,3	2,3	3,1	4,2	9,6	8,6	3,4	9,6	7,1	8,2	2,2	3,0	3,0	4,6	7,9
Wishes to own his/her own firm	-	2,1	6,4	8,0	2,3	3,6	5,2	8,6	5,2	0,0	3,6	5,0	8,4	3,8	3,0	3,8	5,8	6,5
Less responsibility	-	0,1	0,7	0,7	2,2	2,5	2,5	1,6	0,0	0,0	0,0	0,3	0,9	2,3	2,6	2,4	2,4	2,2
Does not like having a boss	7,4	8,5	5,9	6,6	7,9	8,8	8,8	8,4	6,6	6,3	1,9	7,0	7,1	6,8	6,8	8,8	9,7	10,8
Family tradition	-	0,7	2,5	0,3	8,7	7,6	4,0	3,0	0,0	0,0	5,0	1,5	0,4	7,8	5,7	5,3	4,8	5,1
Inherited the business	-	0,0	1,6	0,3	2,6	1,7	0,9	0,3	0,0	0,0	1,3	1,2	0,5	1,8	1,7	1,3	1,0	0,8
Is used to working independently	13,1	15,7	9,8	8,5	18,8	17,9	14,1	10,2	2,9	16,0	12,4	7,9	10,0	15,2	15,9	15,9	16,6	14,3
Other reasons	-	6,6	4,7	9,5	7,9	10,8	10,3	12,3	7,4	2,5	7,0	8,9	7,6	11,6	11,4	10,3	10,3	8,7

Total by column does not add up to 100 since individuals may give up to two answers.

Source: National Household Survey August to December (2006). Author's calculations.

bracket. As a matter of fact, this turns out to be the second most important reason among informal self-employed workers between the ages of 25 and 44 (17.2%), even more so than their age (9%), the fact that their used to working independently (15%) or the availability of higher pay (11.7%). In the case of formal self-employed workers between the ages of 25 and 44, more flexible hours comes in as the third most common response (17%) right after the availability of higher pay (21.7%).

Rural formal self-employed workers are more likely to report that they work independently because they were fired and have not been able to find another job than urban ones (17.2% vs. 9.5%) and also more likely to report that it is due to flexible hours (15.7% in rural areas vs. 14.3% in urban areas). Urban formal self-employed workers are more likely to report that this was the only job they could find than their rural counterparts (47% vs. 42%) while the opposite is true in the case of informal workers. In particular, 60.6% of informal rural self-employed workers indicate they work independently because they could not find another job while 52.7% of urban informal workers do.

Among college graduates, not being able to find another job is by far the most reported reason for working as self-employed workers, especially in the case of formal workers. In particular, 49% of them report this is the reason while higher pay comes at a distant second with only about 19.7% of college graduates in formal self-employment. Among less educated workers (primary and secondary education) age is a more important factor than for college graduates. Most formal self-employed workers with no education report they work independently because this implies higher pay than working as employees. This is interesting, in the sense that it suggests that the formal sector is not generating opportunities for uneducated workers that are comparable to what they could achieve working independently (regardless of social security coverage).

Among informal workers, the relevance of age as a reason for working independently decreases monotonically with education. Similarly, the fraction of people that respond that the reason why they work independently is because they could not find another job decreases with education. For example, 60% of informal self-employed workers with no education indicate this is the reason why the work as independent

workers while 41% of informal self-employed workers with college education do. In addition, the importance of more flexible hours increases with education. About 17% of college graduates in the informal sector indicate they are self-employed because of the flexibility in hours while only 4.3% of those with no education do.

Among formal self-employed workers, the likelihood of reporting that this is the only job they could find as a reason to work independently decreases with income. However, note that this fraction is relatively low in the case of the poorest (39% compared with 43% among the richest). The reason is that a disproportionally large fraction of formal self-employed workers in the lowest income quintile report they work independently because they were fired and have not been able to find another job (22.2% compared with 10% among the richest). Among informal self-employed workers, the likelihood of reporting that this is the only job they could find decreases monotonically with income. In particular, 63% of the poorest indicated this is the reason why the work independently while 38% of the richest do.

Also the richest individuals (in the highest quintile) are more likely to report that they work independently because this implies higher pay than the poorest (26.4% vs. 2.3% among the formal self-employed). Something similar happens among informal self-employed individuals. The likelihood of reporting that the flexibility in hours is the reason why they work independently increases with income, and turns out to be a very relevant dimension for people in the highest income quintile. For example, 18% of informal self-employed workers in the highest income quintile indicated this was the reason compared with 11.2% of informal self-employed in the lowest income quintile.

The relevance of the life cycle effect seems to be more relevant for the poorest than for the richest (although this relationship is not monotonic). Note that 26% of formal self-employed workers in the lowest income quintile indicate they work independently due to their age while 16% among the richest do. Something very similar happens among informal self-employed workers. Finally, individuals in the highest income quintile are more likely to report they work independently because they prefer to own their business and because they like the idea of not having a boss than poorer self-employed workers.

2. Motivations of employers

Finally, in Table 12 we show how the motivations for independent work vary by selected socio-demographic characteristics of employers. Most male formal employers indicate they work independently because this is associated with higher pay (38.7%). This fraction is significantly higher than in the case of female formal employers (24%). Women (formal) are more likely than men to report reasons like flexibility in hours (23.5% vs. 12%), more stability/better future (22% vs. 13.3%), better prospects (22.8% vs. 18.5%), and the wish to own her own firm (23% vs. 17%) for working as employers rather than employees.

The ordering of motivations for independent work for male informal employers and female informal employers is very similar, except for the fact that women are significantly more likely than men to indicate that more flexible hours is an important reason (18.6% of women vs. 11.3% of men). Most men and women working as informal employers indicate the reason is this was the only job they cound find (24% and 23.6% respectively). For men, the second most important reason is the availability of higher pay (23.7%) followed by his age (19.2%). And for women, their age is the second most important reason for working independently (19.3%) followed by more flexibility in hours and higher pay (18.6%).

Formal employers between the ages of 25 and 44 are more likely to indicate they work independently because of the availability of higher pay than older workers (40% vs. 32.7%) and less likely to report that it is due to their age (3.7% vs. 16.7%). In addition, the former group is more likely to indicate that the reason is they could not find another job than the latter group (11.9% vs. 6.1%).

Among informal employers, the youngest –between the ages of 15 and 18– are very likely to indicate that they work independently because of the availability of higher pay (56%) and because they are used to working independently (43%). For workers older than 19, not being able to find another job becomes a more relevant reason. For example, 24% of individuals between the ages of 19 and 24 and 24.6% of workers 25 to 44 years of age report this is the reason why they work as employers. Age is the most important factor for informal employ-

Table 12.   Motivations of employers by socio-demographic characteristics (% by column).

Motivation	Formal Men	Formal Women	Informal Men	Informal Women	Formal <15 yrs	Formal 15-18	Formal 19-24	Formal 25-44	Formal >45	Informal <15 yrs	Informal 15-18	Informal 19-24	Informal 25-44	Informal >45	Formal Urban	Formal Rural	Informal Urban	Informal Rural
Was fired and has not found another job	2,3	-	2,1	1,6	-	-	-	0,6	2,9	-	-	-	2,0	2,1	1,4	14,8	2,7	0,6
Only job he/she could get	10,2	3,1	24,0	23,8	-	-	-	11,9	6,1	1,2	24,1	25,9	24,6	23,5	9,1	-	20,2	31,0
Higher pay	38,7	24,0	23,7	18,8	-	56,4	100,0	39,9	32,7	-	-	20,1	27,0	18,8	36,5	13,0	26,0	15,9
More flexible hours	11,9	23,5	11,3	18,6	-	-	100,0	14,1	13,0	-	-	0,5	16,6	10,2	14,3	10,6	15,6	8,3
Due to his/her age	11,2	7,8	19,2	19,3	-	-	-	3,7	16,7	-	-	-	7,3	29,2	10,1	23,9	16,7	24,1
More stability or better future	13,3	21,9	6,4	8,0	-	-	-	14,8	15,4	-	8,4	-	8,2	5,7	15,4	-	7,2	5,9
Better prospects	18,5	22,8	10,2	12,8	-	32,5	-	21,0	18,1	-	15,4	13,9	16,9	8,2	19,6	11,0	12,9	6,9
Wishes to own his/herown firm	17,3	23,1	14,0	11,3	-	-	-	19,5	17,6	-	7,9	-	-	11,1	18,1	27,8	15,1	10,2
Less responsibility	0,4	3,0	2,3	3,7	-	-	-	1,8	0,2	-	4,7	-	2,7	2,5	1,0	0,0	3,2	1,6
Does not like having a boss	15,5	15,0	14,9	10,2	-	24,1	100,0	14,0	15,5	-	20,2	-	15,1	12,4	15,5	13,3	14,9	11,6
Family tradition	5,4	4,6	13,1	9,9	-	-	-	2,3	8,0	-	3,8	-	10,9	13,8	5,0	14,4	6,5	23,4
Inherited the business	0,9	4,9	4,4	5,2	-	-	-	0,4	2,9	-	18,6	-	3,0	5,3	1,3	13,5	2,2	9,1
Is used to working independently	15,9	11,1	4,4	5,2	-	43,6	-	14,3	15,9	-	9,9	-	19,7	21,9	15,2	9,4	17,6	26,6
Other reasons	3,9	6,1	22,4	15,3	-	-	-	4,5	4,3	-	0,6	-	6,1	6,2	3,8	22,9	6,0	6,0

Motivation	Formal None	Formal Primary	Formal Secondary	Formal College	Informal None	Informal Primary	Informal Secondary	Informal College	Formal Quintile 1	Formal 2	Formal 3	Formal 4	Formal 5	Informal Quintile 1	Informal 2	Informal 3	Informal 4	Informal 5
Was fired and has not found another job	-	5,1	2,6	1,1	0,4	1,2	2,6	3,7	0,5	0,0	8,7	0,7	1,7	1,2	0,5	4,0	1,9	2,0
Only job he/she could get	-	18,8	9,6	7,1	44,3	28,9	21,2	13,7	3,4	5,3	5,0	7,4	10,1	42,2	29,9	33,6	23,7	13,5
Higher pay	-	26,7	33,8	37,9	16,1	18,3	28,7	25,8	27,6	50,8	12,1	39,3	37,3	12,1	12,6	15,4	24,7	29,5
More flexible hours	-	14,8	6,7	17,2	9,4	10,2	14,4	21,2	8,3	43,0	12,5	19,2	12,8	10,7	6,7	8,3	13,9	16,5
Due to his/her age	-	18,7	14,6	7,6	31,5	23,8	15,2	13,8	0,6	18,4	7,9	6,2	10,7	24,9	26,3	19,4	15,6	17,3
More stability or better future	-	3,9	10,2	18,5	2,7	3,3	9,9	11,0	4,3	9,4	16,4	2,9	17,7	4,1	7,7	4,1	5,2	9,0
Better prospects	-	7,4	18,1	21,6	1,9	9,7	12,7	15,1	7,5	0,0	35,6	9,0	21,8	6,4	5,9	8,7	12,1	13,6
Wishes to own his/her own firm	-	15,2	16,6	19,6	4,2	9,9	16,3	21,2	37,0	9,4	13,0	8,8	17,8	12,3	13,8	7,2	13,0	15,8
Less responsibility	-	-	1,5	0,8	3,9	2,6	2,4	3,4	4,8	0,0	0,9	0,0	0,6	2,1	1,4	2,8	3,4	2,7
Does not like having a boss	-	24,0	13,5	15,0	12,3	12,9	15,4	14,4	17,5	32,3	14,5	25,5	13,3	10,1	15,8	11,2	16,7	14,0
Family tradition	-	16,4	7,1	3,0	19,0	16,8	9,1	6,6	9,8	0,0	0,7	8,5	5,0	17,5	16,8	16,6	8,9	9,7
Inherited the business	-	0,0	1,0	2,3	6,3	5,9	3,9	2,9	1,4	0,0	15,6	6,2	0,0	5,4	4,8	7,7	6,7	2,4
Is used to working independently	-	14,8	21,3	12,4	20,0	27,0	17,5	13,7	25,5	15,1	23,7	7,8	13,7	26,0	19,9	18,0	22,4	19,2
Other reasons	-	11,7	4,4	3,3	6,6	7,6	4,6	5,6	3,1	4,6	7,1	17,0	3,1	4,6	6,2	8,1	5,6	6,0

Total by column does not add up to 100 since individuals may give up to two answers.

Source: National Household Survey August to December (2006). Author's calculations.

ers older than 45, and significantly more so than in the case of formal employers (29% vs. 16%). In addition, the availability of higher pay becomes less relevant for the oldest compared to the youngest (18.8% vs. 27% of informal employers between the ages of 25 and 44).

Urban employers are significantly more likely than rural employers to report they work independently due to the availability of higher pay (for example, 36.5% vs. 13% among formal employers). In rural areas, other reasons seem to be more important, such as, not being able to find another job and not finding a job after being fired, age, and other unreported reasons. More flexible hours seems to be more relevant among urban employers than rural ones.

The importance of the availability of a higher pay as a reason to work independently increases with education, although this relationship is not monotonic among informal employers. For example, 26.7% of formal employers with primary education indicate this is the reason why they are employers rather than employees while 38% of college graduates do. The relevance of not being able to find another job decreases with education for both, formal and informal employers. The life cycle seems to be more important for the less educated than the more educated. And more flexibility of hours seems to be more important for college graduates than for other workers.

Among informal employers, the likelihood of indicating that the availability of higher pay is the reason why they work independently increases with income. On the other hand, the probability of reporting that the reason is they could not find another job decreases monotonically with income. For example, 42% of informal employers in the lowest income quintile do while only about 13.5% in the highest income quintile do. Also the relevance of age seems to be higher for the poorest than for the richest, and more flexible hours seems to matter more for the highest quintile than for the lowest although this relationship is not monotonic.

In the case of formal employers, things are less clear. For example, formal employers in the second income quintile are more likely than everybody else to report the reason they work independently is the availability of higher pay (51% vs. 27.6% in the lowest quintile and 37% in the highest quintile). In this case, the richest workers are more

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likely to report that they could not find another job than the poorest (contrary to what happens in the informal sector). In particular, 3.4% of formal employers in the lowest income quintile vs. 10% of formal employers in the highest income quintile. The third income quintile seems to behave quite differently from the others. Most formal employers in this group indicate they work independently because of the possibility of better prospects (35%), followed by the fact they are used to working independently (23.7%) and more stability and better future (16.4%).

C. Preference for independent work

In addition to the motivation questions previously discussed, the survey also includes questions that investigate the preferences of independent workers for formal jobs as employees. In particular, it inquires whether independent workers would accept a job as employees and under what conditions. In Table 13 we present the percentage of individuals in each labor force category (e.g., the fraction of formal self-employed workers) that would take a job as employees if it offered benefits and lower wage (than the current occupation) or the same wage as in the current occupation. It is important to note that the survey first asks whether the independent worker would take a job as employee if it offered benefits but a wage lower than his current earnings, and then inquires about the possibility of accepting the job if it offered the same wage but only to those who replied they would not accept it for a lower wage.

Table 13. Preference for independent work (national).

Motivation	% by column					
	Independent workers	Formal self-employed	Informal self-employed	Formal employer	Informal employer	Other independent
Would accept a job as employee with benefits for lower wage	26,0	28,7	27,1	11,5	16,7	28,3
Would accept a job as employee with benefits for same wage	37,1	41,4	39,1	12,5	22,6	44,7

The first number in the first panel indicates that 26% of all independent workers would accept a job as employees with benefits even at a lower wage. In addition, 37% of all independent workers who would

not switch to a formal job if it offers a lower wage, would accept it if it offers the same wage as his/her current occupation (i.e., an additional 27% of all independent workers). This means that around 53% of total independent workers would actually accept a formal job, half of these would accept it even if it offers a lower wage and half of these would accept it if it offers the same wage. Interestingly, still 47% of independent workers would not want to work as employees even if, in addition to the same earnings they currently make, they could get benefits. This implies that a significant fraction of independent workers seem to report an actual preference for independent work regardless of conditions.

Among self-employed workers, these fractions do not vary significantly depending on whether they are formal or informal. For example, 27% of informal self-employed workers would accept a job with benefits at a lower wage, and 28.7% of formal self-employed workers would. Among employers, there is a difference between formal and informal ones. However, these fractions are lower than in the case of self-employed workers. In particular, 16.7% of informal employers would accept a job with benefits for a lower wage while only 11.5% of formal employers would. In addition, 22.6% of informal employers who would not switch for a lower wage, would do it for a wage that is equal to their current one. These results indicate that even among informal workers, a huge fraction of independent workers would not accept a job with benefits even if it guarantees a salary at least as good as their current earnings. This suggests that it is not necessarily the case that most of these workers are in this labor force category (independent covered and uncovered workers) but would rather be in another one (in particular, covered employees). It seems a significant fraction of workers either voluntarily choose to be in a given category or do not report they would actually like to be in a different one.

In Table 14 we show how the responses for preference for independent work correlate with selected socio-demographic characteristics. We do this by implementing a logistic regression of the probability that an independent worker would accept a formal job[29] on a set of explana-

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[29]   For the logistic regression, we define the dependent variable to be 1 for all independent workers that report they would accept a job as employees for a lower wage plus benefits and all independent workers that report they would accept the job for the same wage plus benefits, 0 otherwise.

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tory variables. In the first column we include only socio-demographic characteristics of workers as explanatory variables. In the second column we add characteristics of the firm.

Table 14.   Determinants of the probability that an independent worker would accept a formal job.

(Marginal effects - evaluated at means)

Dep. Var-> Pr(accept job as employee with benefits at less or equal wage = 1)	(1)		(2)	
I[Male]	0,0542 (0,0052)	***	0,0414 (0,0057)	***
I[Age 15 - 18]	0,2319 (0,0278)	***	0,2245 (0,0284)	***
I[Age 19 - 24]	0,2843 (0,0247)	***	0,2699 (0,0257)	***
I[Age 25 - 44]	0,3095 (0,0323)	***	0,2956 (0,0337)	***
I[Age 45 +]	0,2067 (0,0348)	***	0,1985 (0,0351)	***
I[Head]	-0,0467 (0,0191)	**	-0,0398 (0,0193)	**
I[Spouse]	-0,0920 (0,0200)	***	-0,0846 (0,0202)	***
I[Child]	-0,0173 (0,0198)		-0,0188 (0,0199)	
I[Grandchild]	-0,0131 (0,0310)		-0,0158 (0,0312)	
I[Other Relative]	-0,0512 (0,0210)	**	-0,0493 (0,0212)	**
I[Urban]	0,0792 (0,0084)	***	0,0413 (0,0105)	***
I[Primary Education]	0,0435 (0,0097)	***	0,0411 (0,0097)	***
I[Secondary Educaction]	0,0568 (0,0099)	***	0,0532 (0,0100)	***
I[College]	0,0208 (0,0114)	*	0,0022 (0,0116)	
I[Indigenous]	0,0785 (0,0147)	***	0,0748 (0,0148)	***
I[Afro-colombian]	0,0795 (0,0082)	***	0,0736 (0,0083)	***
I[Quintile 1]	0,0994 (0,0074)	***	0,1018 (0,0075)	***
I[Quintile 2]	0,1144 (0,0071)	***	0,1166 (0,0072)	***
I[Quintile 3]	0,1059 (0,0065)	***	0,1060 (0,0066)	***

Table 14.   Determinants of the probability that an independent worker would accept a formal job (continued).

I[Quintile 4]	0,0673	***	0,0665	***
	(0,0064)		(0,0064)	
I[Self-Employed]	-0,0230		0,0102	
	(0,0273)		(0,0283)	
I[Employer]	-0,2192	***	-0,1729	***
	(0,0266)		(0,0284)	
I[Informal]	-0,0106		0,0529	***
	(0,0105)		(0,0114)	
I[2 - 5 workers firm]			-0,0040	
			(0,0058)	
I[6 - 10 workers firm]			0,0158	
			(0,0151)	
I[11 - 19 workers firm]			0,0412	*
			(0,0224)	
I[20 - 30 workers firm]			0,0994	***
			(0,0242)	
I[31 or more workers firm]			0,1454	***
			(0,0130)	
I[Agriculture]			-0,0660	
			(0,0534)	
I[Manufacturing]			-0,0509	
			(0,0528)	
I[Private Services]			0,0137	
			(0,0519)	
I[Public Services]			0,1958	***
			(0,0472)	
I[Transportacion/Communication]			0,0411	
			(0,0514)	
I[Construction]			0,1235	***
			(0,0478)	
I[Retail]			-0,0608	
			(0,0523)	
Sample	Independent		Independent	
Max Likelihood Function	-35.553		-35.131,74	
Number of obs.	53.535		53.535	
Pseudo-R2	0,0354		0,0468	

Self Employed / Employers / Other

The results indicate that male independent workers are significantly more likely than women to indicate they would accept a formal job for lower salary or the same salary plus benefits. In particular, men are 4 percentage points more likely to respond they would actually accept the formal job than female independent workers. As documented before, it seems that, in fact, women are more likely to be informal workers

by choice as these occupations are associated with more flexibility (in terms of hours) and are more compatible with family responsibilities. Older independent workers are more likely to report they would accept a formal job than the youngest (younger than 15 years of age). This effect increases with age except in the case of workers older than 45. For example, independent workers between the ages of 19 and 24 are 27 percentage points more likely to indicate they would accept a formal job than the youngest, and workers between the ages of 25 and 44 are about 30 percentage points more likely to report they would accept the job. On the other hand, workers with more than 45 years of age are only 20 percentage points more likely than the youngest to report they would take the formal job.

Independent workers who are head of the household, spouse of the head of the household or other relatives of the head are significantly less likely than non-relatives in the household to indicate they would accept a formal job. For example, independent workers who are heads of household are 4 percentage points less likely than non-relatives to indicate they would accept a formal job if one was offered to them. In addition, independent workers in urban areas are significantly more likely to report they would accept a formal job than in rural areas. In particular, urban independent workers are about 4 percentage points more likely to report they would accept the job than rural independent workers. Independent workers with primary education and secondary education are significantly more likely than uneducated independent workers to report they would accept a formal job (even if it offered a lower wage). For example, independent workers with secondary education are 5 percentage points more likely than uneducated ones to have answered yes to the question. However, college educated workers are as likely as uneducated workers to report they would accept the formal job.

Independent workers who belong to an ethnic minority are significantly more likely to report they would accept a formal job than whites and mestizos. The effect is quantitatively similar for both, indigenous and afro-colombian independent workers. In particular, both are about 7 percentage points more likely than whites and mestizos to report they would actually accept the formal job. In addition, independent workers in the lowest tail of the income distribution are more likely to report

they would accept the job than independent workers in the top quintile of the income distribution. For example, independent workers who belong to households in the lowest income quintile are 10 percentage points more likely to report they would accept a formal job than independent workers in the top quintile.

Interestingly, employers are significantly less likely than unpaid and other independent workers to report they would accept a formal job if one was offered to them. In particular, employers are about 17 percentage points less likely to report they would take the formal job. On the other hand, self-employed workers are not significantly more or less likely than unpaid and other independent workers to report they would accept the formal job. Recall that employers are also the workers with highest levels of job satisfaction (see Table 8).

Independent workers affiliated to big firms (more than 20 workers) are significantly more likely to report they would accept a formal job if one was offered to them than individuals who work on their own. For example, independent workers affiliated to firms with more than 30 workers are 14 percentage points more likely to indicate they would accept the formal job than individuals who work on their own. In the case of independent workers affiliated to firms with 11 to 19 workers the probability is only marginally higher. However, the probability that an independent worker indicates she would accept a formal job is not significantly different between workers in small firms (less than 10 workers) and individuals who work on their own. Finally, only independent workers in the public services sector and the construction sector are significantly more likely to indicate they would accept the formal job than independent workers in all "other" sectors.

IV. Conclusions

In this paper we have studied the extent and nature of informality in Colombia by using a new source of data. In particular, we use a new chapter on informality in the *Encuesta Continua de Hogares* (ECH) from August 2006 to December 2006, which includes questions deepening the information on coverage of social protection benefits, labor market trajectories, and motivation for sector of employment.

The availability of these new data allows us to measure informality in several ways and understand the differences and implications of using various definitions.

We show that using social security contributions as a measure of formality is sensible for various reasons. Basically, it adheres to the basic concept of informality as employment that goes unreported and is not covered by the regulatory framework, it clearly identifies vulnerable workers, it is highly correlated with several other widely used definitions of informality and, as we show, is a good indicator that the individual has the entire package of benefits associated with formal employment.

Around 26% of the national work force, or about 4 million 5 hundred thousand workers, pay contributions to both, pension and health. This would imply a national informal sector of around 74%. The fraction of formal employment in 13 main metropolitan areas is 37.8%, in urban areas it is 31.2% and in rural areas it is around 10%, which implies an informal sector of 62% in the 13 main metropolitan areas, 69% in urban areas and 90% in rural areas. The traditional measure of informality based upon firm size[30] used by the National Department of Statistics (DANE) implies a national informal sector of about 67.5%. We should note that informality rates typically made public or presented in recent research refer to calculations based upon the National Household Survey usually for the seven main cities instead of the national total. As we have reported, measures of formal employment in rural areas are significantly lower than in urban areas. For example, while 38% of workers in the main 13 metropolitan areas make contributions to both, health and pension, only about 10% do so in rural areas. Note that this would imply an informal sector of about 62% in the 13 main metropolitan cities (very much in line with informality rates usually published based upon the official definition used by DANE). However, when we refer to national totals, this rate is significantly higher due, in particular, to the inclusion of the rural sector.

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[30] The group of employees and employers working in firms with less than 10 workers, unpaid family workers, domestic household workers, and self-employed individuals who are not professionals or technicians.

We then use this definition of informality to study the nature of this phenomenon in Colombia. In particular, we characterize informal workers in various dimensions that include socio-demographic characteristics, characteristics of the firm and job satisfaction measures. The results reported in the descriptive statistics as well as the logistic regressions[31] indicate that young workers, females, other relatives (like grandchildren) and non-relatives residing in the household, rural workers, uneducated individuals, ethnic minorities and the poorest are more likely to be informal workers. For example, men are around one percentage point less likely to be informal workers than women, workers between the ages of 25 and 44 years of age are 2.3 percentage points more likely to be informal than those older than 45, while younger workers between the ages of 15 and 18 are almost 13 percentage points more likely to be informal than the oldest, workers with college education are 27 percentage points less likely to be informal with respect to uneducated workers and indigenous workers are 5.4 percentage points more likely to be informal than white/mestizo workers while afro-colombian workers are about 2.2 percentage points more likely to be informal.

As expected, individuals working in small firms are also more likely to be informal, as are workers in the agriculture and construction sectors. In addition, we find substantial differences between the urban and rural areas. Gender is not statistically significant in explaining the probability of informality in rural areas. More generally, the marginal effects of most observed characteristics are smaller in rural areas than in urban areas. Tertiary education has a very big effect on the probability of being an informal worker both in urban and rural areas. College educated workers are 32 percentage points less likely to be informal than uneducated workers in urban areas and 40 percentage points less likely in rural areas. However, the effects of primary and secondary education on the probaiblity of being an informal worker are very small in rural areas compared with urban areas. For example, workers with primary education are 10 percentage points less likely than uneducated workers to be informal in urban areas while this effect is only about 0.3 percentage points in rural areas. That means that in

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[31]   This exercise allows us to uncover the partial effect of each observed characteristic of workers and firms on informality is as well as the relative importance of the different characteristics in determining the probability of working in the informal labor market.

rural areas, only college educated workers are significantly less likely to be informal while primary and secondary education only marginally decreases the probability of informality. Finally, even poverty is less important in explaining the probability of informality in rural areas than in urban areas.

Although these preliminary results suggest more vulnerable individuals are more likely to be informal workers, some additional evidence hints to two interesting facts. First, part of informal employment seems to be in fact the result of lack of better opportunities while part of it seems to be due to individual choices of workers. Second, some preliminary evidence indicates that informal jobs are not necessarily of lower quality than formal jobs.

First, we provide evidence that about 50% of independent workers (covered or not) would not accept a formal job with benefits either at a lower wage or at the same wage as their current occupation. This is interesting, in the sense that although a significant fraction of independent workers would rather work as formal employees with benefits (even if that implies a lower wage) about half of independent workers would actually not. This evidence suggests that informality might be in a large number of cases a personal choice and not always the result of lack of better opportunities.

More generally, male, older and urban independent workers are significantly more likely to report they would accept a formal job even at a lower wage. Interestingly, the head of the household is significantly less likely to report he/she would take the formal job than other non-relatives residing in the household. Independent workers with primary education and secondary education are significantly more likely than uneducated independent workers to report they would accept a formal job. However, college educated workers are as likely as uneducated workers to report they would accept the formal job, which, again, hints to independent work as being a choice rather than a result of lack of better alternatives *in some cases*.

In addition, a significant fraction of independent workers indicate they do not work as employees because working independently implies a higher wage. Admittedly, this is less likely among informal inde-

pendent workers. Also, a significant fraction of workers, especially women, indicate they work independently (and mostly among informal independent workers) due to the flexibility in hours. However, most independent workers indicate they work independently because this was the only job they could find.

In sum, although part of informality appears to be due to voluntary choices of workers that seek higher earnings, more flexibility in hours and/or more compatibility with other responsabilities such as the family and school, the bulk of it is still associated with the lack of opportunities. The lack of sufficient formal jobs in the economy might be due to a variety of reasons, including the business cycle, the presence of distorsions in the regulatory framework, high labor costs, and the difficulty of authorities to enforce the regulation, among other things. The levels of informality in Colombia fluctuate very moderately across the business cycle. This means that creating formal jobs is costly regardless of whether the economy is experiencing a boom or a bust. Several authors have presented evidence that non-wage labor costs[32], which are significantly higher in Colombia than in some comparable economies in the world and in Latin America, are associated with less dynamic formal labor markets[33].

Second, some of the results presented in the paper indicate that informal jobs are not necessarily of lower quality than formal jobs and/or that some informal workers do not perceive their occupation as being of lower quality in relevant dimensions. For example, even though the distribution of labor earnings of informal workers is skewed to the left with respect to the distribution of earnings of formal workers, an important fraction of informal workers have high labor earnings especially compared with formal employees. For example, a significant fraction of employers (including informal ones) have earnings above five minimum wages per month. In particular, about 25% of informal employers earn more than 5 minimum wages while only about 7% of formal employees do. In addition, the likelihood of having high

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[32] In Colombia an employer has to pay 52% of the basic salary in non-wage labor costs. These costs are approximately 38% in Costa Rica, 30% in Chile, 36% in Ecuador, 40% in Peru and are only comparable in countries like Brazil (with 50%) and Argentina (47%).

[33] See, for example, Bernal y Cárdenas (2003), Kugler (2003), Heckman and Pagés (2003), Echeverry and Santa María (2004) and Mondragón et al (2009).

monthly labor earnings (e.g., more than 5 minimum wages) is higher among self-employed workers -both formal and informal- than among formal employees (18.4% and 10.8% vs. 7%). In addition, about 46% of all individuals that earn more than five minimum wages per month are actually informal self-employed workers, while only about 20% are formal employees.

An important fraction of informal workers work for large firms and an equally important number of formal workers work for small firms. In particular, around 24% of informal employees work in firms with more than 10 workers and nearly 17% of formal employees are actually affiliated to firms with 10 workers or less. This result is interesting in the sense that it suggests that although there is a high correlation between making contributions to social security and working in small firms, it is not necessarily the case that all informal workers work in small firms and vice versa, thus using the size of the firm to measure informality might be inaccurate. In addition, if employment in small firms is usually associated with less human capital investment opportunities, fewer promotion possibilities, and sometimes worse working conditions, then this result also suggests that not all informal employment is worse in these dimensions as some informal employment takes place in large firms.

Finally, some additional data about the level of satisfaction of workers with their occupation reveals interesting information about the differences between formal and informal jobs. Although informal workers seem to be more generally dissatisfied with their jobs than formal workers, the reasons why this is the case are less related to earnings and/or inherent characteristics of jobs (such as hours, perception of under-utilization of own capacities, level of requirements, etc.) and more so with the notion of instability and the fact that informal occupations are more likely to be temporary than formal ones[34].

In particular, the likelihood of wanting to leave a job due to low wages is not significantly different between formal and informal workers. For example, while 97% of informal employees who want to change jobs report that would like to change jobs in order to increase their

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[34] Although most workers (both formal and informal) who report they would like to change jobs indicate they do because they need higher income.

income, about 95% of formal employees do. This difference is higher in the case of self-employed workers and employers, but still low compared to other reported reasons for wanting to change jobs such as feeling under-utilized (51% of informal employees vs. 62% of formal employees and 46% of informal self-employed workers vs. 64% of formal self-employed workers), work less hours or the fact that the job is too demanding. However, the differences are quite significant when the reason for wanting to leave refers to the fact that the current job is temporary. For example, 46% of informal employees and 24% of formal employees indicate this is the reason why they want to change jobs.

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Appendix

Appendix 1.   Correlation matrix – definitions of informality (semester total, urban only).

	inf_1	inf_2	inf_3	inf_4	inf_5	inf_6	inf_7	inf_8	inf_9	inf_10	inf_11	inf_13	inf_14	inf_15	inf_16	inf_17	inf_19	inf_21	inf_24	inf_25	inf_26	inf_27
inf_1	1,00																					
inf_2	0,83	1,00																				
inf_3	0,98	0,85	1,00																			
inf_4	0,79	0,75	0,79	1,00																		
inf_5	0,85	0,72	0,85	0,94	1,00																	
inf_6	0,79	0,77	0,81	0,98	0,94	1,00																
inf_7	0,84	0,73	0,86	0,93	0,99	0,95	1,00															
inf_8	0,57	0,52	0,58	0,53	0,55	0,55	0,54	1,00														
inf_9	0,81	0,74	0,83	0,74	0,76	0,75	0,77	0,60	1,00													
inf_10	0,50	0,45	0,51	0,44	0,45	0,44	0,45	0,31	0,55	1,00												
inf_11	0,67	0,62	0,68	0,59	0,61	0,60	0,61	0,47	0,75	0,64	1,00											
inf_13	0,79	0,69	0,81	0,81	0,87	0,93	0,89	0,59	0,82	0,49	0,66	1,00										
inf_14	0,56	0,49	0,58	0,62	0,66	0,64	0,67	0,84	0,58	0,29	0,43	0,72	1,00									
inf_15	0,75	0,66	0,77	0,83	0,89	0,85	0,90	0,55	0,86	0,64	0,51	0,72	0,96	1,00								
inf_16	0,46	0,40	0,47	0,58	0,55	0,55	0,52	0,29	0,49	0,68	0,54	0,83	0,59	0,35	1,00							
inf_17	0,63	0,55	0,65	0,70	0,75	0,72	0,72	0,44	0,68	0,65	0,57	0,79	0,81	0,53	0,58	1,00						
inf_19	0,82	0,76	0,83	0,83	0,75	0,75	0,75	0,69	0,90	0,65	0,51	0,81	0,81	0,58	0,79	0,65	1,00					
inf_21	0,71	0,65	0,73	0,73	0,66	0,68	0,69	0,57	0,77	0,65	0,51	0,72	0,72	0,54	0,78	0,48	0,78	1,00				
inf_24	-0,07	0,04	-0,09	-0,07	-0,10	-0,08	-0,10	-0,06	-0,12	-0,12	-0,07	-0,08	-0,12	-0,08	-0,12	-0,08	-0,10	-0,08	1,00			
inf_25	-0,03	0,08	-0,05	-0,04	-0,07	-0,05	-0,08	-0,02	-0,08	-0,08	-0,05	-0,05	-0,09	-0,06	-0,10	-0,06	-0,08	-0,04	0,94	1,00		
inf_26	0,80	0,76	0,81	0,72	0,73	0,72	0,73	0,56	0,84	0,84	0,48	0,66	0,72	0,52	0,72	0,43	0,58	0,82	0,69	-0,07	1,00	
inf_27	0,84	0,78	0,85	0,75	0,76	0,76	0,76	0,58	0,87	0,87	0,51	0,68	0,76	0,55	0,76	0,45	0,62	0,84	0,72	-0,13	0,93	1,00

Definitions described in Table 1.

Appendix 2.   Correlation matrix - definitions of informality (semester total, rural only).

	inf_1	inf_2	inf_3	inf_4	inf_5	inf_6	inf_7	inf_8	inf_9	inf_10	inf_11	inf_13	inf_14	inf_15	inf_16	inf_17	inf_19	inf_21	inf_24	inf_25	inf_26	inf_27
inf_1	1,00																					
inf_2	0,80	1,00																				
inf_3	0,96	0,84	1,00																			
inf_4	0,67	0,65	0,68	1,00																		
inf_5	0,74	0,62	0,75	0,91	1,00																	
inf_6	0,68	0,68	0,71	0,96	0,92	1,00																
inf_7	0,73	0,63	0,76	0,90	0,99	0,93	1,00															
inf_8	0,39	0,35	0,40	0,36	0,39	0,38	0,40	1,00														
inf_9	0,74	0,69	0,76	0,59	0,60	0,60	0,60	0,38	1,00													
inf_10	0,39	0,40	0,40	0,31	0,32	0,33	0,33	0,19	0,44	1,00												
inf_11	0,63	0,61	0,63	0,52	0,55	0,53	0,55	0,33	0,64	0,60	1,00											
inf_13	0,67	0,58	0,70	0,83	0,91	0,86	0,92	0,43	0,65	0,36	0,59	1,00										
inf_14	0,36	0,31	0,37	0,44	0,48	0,46	0,49	0,82	0,35	0,14	0,29	0,53	1,00									
inf_15	0,62	0,54	0,64	0,76	0,83	0,79	0,85	0,40	0,72	0,34	0,53	0,92	0,49	1,00								
inf_16	0,37	0,32	0,38	0,45	0,49	0,47	0,50	0,17	0,37	0,67	0,41	0,54	0,21	0,52	1,00							
inf_17	0,58	0,51	0,61	0,72	0,79	0,75	0,80	0,35	0,56	0,40	0,69	0,87	0,43	0,78	0,60	1,00						
inf_19	0,75	0,73	0,77	0,59	0,61	0,60	0,60	0,43	0,84	0,54	0,83	0,66	0,35	0,60	0,36	0,57	1,00					
inf_21	0,66	0,62	0,67	0,53	0,56	0,54	0,56	0,37	0,69	0,42	0,57	0,57	0,34	0,56	0,33	0,50	0,69	1,00				
inf_24	0,02	0,05	0,00	0,00	-0,02	-0,01	-0,02	-0,03	0,01	0,01	0,02	-0,02	-0,03	-0,02	-0,01	-0,02	0,04	0,02	1,00			
inf_25	0,04	0,08	0,03	0,02	0,00	0,01	0,00	-0,02	0,03	0,03	0,04	0,00	-0,03	-0,01	0,00	0,00	0,07	0,04	0,94	1,00		
inf_26	0,63	0,63	0,64	0,50	0,50	0,50	0,50	0,30	0,70	0,33	0,49	0,48	0,27	0,50	0,27	0,41	0,64	0,53	0,09	0,12	1,00	
inf_27	0,75	0,72	0,76	0,60	0,61	0,61	0,61	0,39	0,80	0,38	0,56	0,60	0,36	0,62	0,34	0,50	0,72	0,61	-0,02	0,01	0,76	1,00

Definitions described in Table 1

Appendix 3. Correlation matrix - definitions of informality and vulnerability (national).

	inf_1	inf_2	inf_3	inf_4	inf_5	inf_6	inf_7	inf_9	inf_11	inf_13	inf_15	inf_17	inf_19	inf_21	inf_24	inf_25	inf_26	inf_27	vul
inf_1	1,00																		
inf_2	0,77	1,00																	
inf_3	0,96	0,81	1,00																
inf_4	0,71	0,65	0,71	1,00															
inf_5	0,81	0,65	0,80	0,90	1,00														
inf_6	0,73	0,71	0,77	0,94	0,92	1,00													
inf_7	0,79	0,67	0,82	0,88	0,98	0,94	1,00												
inf_9	0,76	0,65	0,76	0,65	0,69	0,66	0,68	1,00											
inf_11	0,62	0,54	0,62	0,51	0,54	0,52	0,54	0,70	1,00										
inf_13	0,74	0,62	0,77	0,82	0,91	0,88	0,93	0,74	0,59	1,00									
inf_15	0,70	0,59	0,73	0,78	0,86	0,83	0,88	0,80	0,57	0,95	1,00								
inf_17	0,60	0,51	0,62	0,67	0,74	0,71	0,76	0,61	0,76	0,81	0,78	1,00							
inf_19	0,76	0,66	0,75	0,64	0,67	0,65	0,66	0,86	0,77	0,72	0,69	0,59	1,00						
inf_21	0,64	0,55	0,65	0,57	0,61	0,59	0,61	0,70	0,65	0,65	0,63	0,58	0,71	1,00					
inf_24	-0,60	-0,55	-0,59	-0,52	-0,52	-0,51	-0,51	-0,56	-0,46	-0,51	-0,49	-0,42	-0,56	-0,47	1,00				
inf_25	-0,56	-0,52	-0,55	-0,49	-0,48	-0,47	-0,47	-0,53	-0,44	-0,47	-0,45	-0,38	-0,56	-0,45	0,80	1,00			
inf_26	0,69	0,61	0,68	0,60	0,61	0,59	0,60	0,78	0,57	0,61	0,62	0,49	0,73	0,58	-0,58	-0,58	1,00		
inf_27	0,76	0,66	0,75	0,66	0,67	0,65	0,66	0,82	0,61	0,67	0,68	0,54	0,77	0,63	-0,63	-0,60	0,88	1,00	
Vulnerability	-0,52	-0,54	-0,52	-0,46	-0,44	-0,45	-0,44	-0,48	-0,40	-0,42	-0,40	-0,34	-0,49	-0,41	0,46	0,46	-0,46	-0,51	1,00

Definitions described in Table 1.
Vulnerability = 1 if an individual's labor earnings are lower than the minimum wage, 0 otherwise.