ELSEVIER
www.elsevier.com/locate/worlddev

World Development Vol. xx, pp. xxx–xxx, 2016
0305-750X/© 2016 Elsevier Ltd. All rights reserved.

http://dx.doi.org/10.1016/j.worlddev.2016.05.006

Informal *versus* Formal: A Panel Data Analysis of Earnings Gaps in Madagascar

CHRISTOPHE J. NORDMAN [a], FALY RAKOTOMANANA [b] and FRANÇOIS ROUBAUD [a,*]

[a] *Institute of Research for Development (IRD), DIAL, France*
[b] *INSTAT, DIAL, Antananarivo, France*

Summary. — Little is known about the informal sector's income structure vis-à-vis the formal sector, despite its predominant economic weight in developing countries. While most of the papers on this topic are drawn from (emerging) Latin American, Asian or some African countries, Madagascar represents an interesting case. So far, very few studies in general, even less so in Sub-Saharan Africa, used panel data to provide evidence of the informal sector heterogeneity. Taking advantage of the *1-2-3 Surveys* in Madagascar, a four-wave panel dataset (2000–04), we assess the magnitude of various formal/informal sector earnings gaps. Is there an informal sector job earnings penalty? Do some informal sector jobs provide pecuniary premiums and which ones? Do possible gaps vary along the earnings distribution? Ignoring distributional issues is indeed a strong limitation, given the compound question of how informality affects earnings inequality. We address heterogeneity issues at three different levels: the worker, the employment status (wage employment *vs*. self-employment) and the earnings distribution. Standard earnings equations are estimated at the mean and at various conditional quantiles of the earnings distribution. The results suggest that the sign and magnitude of the formal–informal sector earnings gaps highly depend on the workers' employment status and on their relative position in the earnings distribution. In the case of a poor and fragile country like Madagascar, these findings provide new and robust empirical backups for the existence of a mix between the traditional exclusion *vs*. exit hypotheses of the informal sector.

Key words — informal sector, earnings gap, transition matrix, panel data, Madagascar

1. INTRODUCTION

Little is known about the informal sector's income structure vis-à-vis the formal sector, despite its predominant economic weight in developing countries. Some works have been carried out in this field using household surveys, but they only consider some emerging Latin American countries (Argentina, Brazil, Colombia and Mexico; Bargain & Kwenda, 2011, 2014; Gong, Van Soest, & Elizabeth, 2004; Perry *et al*., 2007) and more recently South Africa, Ghana and Tanzania for Africa (Bargain & Kwenda, 2011, 2014; Falco, Kerr, Rankin, Sandefur, & Teal, 2010) and Vietnam for Asia (Nguyen, Nordman, & Roubaud, 2013). It is then hazardous to generalize these results (sometimes diverging) to other parts of the developing world, in particular in very poor countries in Sub-Saharan Africa where the informal sector is the most widespread.

Empirical evidence shows that the existence of informality in poor countries can be understood by a mix of two traditional assumptions (Maloney, 1999, 2004; Perry *et al*., 2007): the exclusion and the exit hypotheses, following Hirschman's seminal work (Perry *et al*., 2007). The first hypothesis, also called the "dualist approach", considers a dual labor market model where the informal sector is viewed as a residual component of this market and is totally unrelated to the formal economy. It is a subsistence economy that only exists because the formal economy is incapable of providing enough jobs, and is condemned to disappear with the development process. Informal sector workers, suffering from poor labor conditions, are queuing for better jobs in the formal sector. The second assumption, also known as the "legalist approach", considers that the informal sector is made up of micro-entrepreneurs who prefer to operate informally to evade the economic regulations (De Soto, 1989); this conservative school of thought is in sharp contrast to the former in that the choice of informality is voluntary due to the exorbitant legalization costs associated with formal status and registration. Then, confirming Field's stylized assessment (1990), a few studies stress the huge heterogeneity among informal sector jobs, which combine two main components: a lower tier segment, where occupying an informal sector job is a constraint choice ("exclusion hypothesis"); an upper-tier segment, in which informal sector jobs are chosen for better earnings, and non-pecuniary benefits ("exit hypothesis"). Usually, the former segment is assimilated to the informal sector wage jobs, while the latter is associated with the self-employed jobs. Therefore, whether one segment is predominant over the other remains an empirical question, depending on local circumstances. To test these alternative views, one major strand of literature focuses on the estimation of earning gaps. Embedded in revealed preferences principle, and considering income as a proxy of individual utility, the approach assumes that if informal sector workers earn more than their formal counterparts all else being equal, one could presume that they have deliberately chosen the informal sector. This may not be true for all informal sector workers. Thus, the challenge is to identify segments of jobs or position in the income distribution where informal sector workers get a higher pay.

In this paper, this is the method we follow in the case of Madagascar. We take advantage of the rich *1-2-3 Surveys* dataset for Antananarivo, specifically designed to capture the informal sector, and in particular its four-wave panel data (2000–2001–2002–2004), to ask the following questions: Is there an informal sector job earnings penalty? Do some informal sector jobs provide pecuniary premiums and which ones? Do possible gaps vary along the earnings distribution?

* The authors thank three anonymous referees, participants at the CSAE Conference 2012 in Oxford (UK), at the 10th Midwest International Economic Development Conference in Madison 2013 (USA), and at the XXIXth Journées de l'Association Tiers-Monde 2013 in Créteil for helpful comments and suggestions on earlier drafts. Final revision accepted: May 4, 2016.

While most of the papers on this topic are drawn from (emerging) Latin American, Asian or some African countries, Madagascar represents an interesting case. To our knowledge, very few studies in general, even less so in Sub-Saharan Africa, and none in the case of Madagascar, used panel data to provide robust evidence of the informal sector heterogeneity.

Madagascar experienced an exceptional period of economic expansion during 1995–2001. Growth appeared to be associated with a decline in the share of the informal sector in urban employment (see Vaillant, Grimm, Lay, & Roubaud, 2014). But, in 2002, a major political crisis following presidential elections reversed this trend. This crisis had disastrous effects on the economy: exports and foreign direct investments fell sharply, GDP declined by about 13% and inflation was close to 16% in 2002 (Cling, Razafindrakoto, & Roubaud, 2005). The share of employment in the informal sector grew again, as workers were laid off from the private sector, in particular in the Export Processing Zones (EPZs). Despite the severity of the economic downturn, recovery was quick, with a GDP growth of about 10% in 2003 and around 5% in the two following years, the period covered by our panel dataset.[1] The country remains however today one of the poorest countries in the world.

Our empirical analysis consists of assessing the magnitude of different types of informal–formal earnings gaps using fixed effects OLS and quantile regressions. While many pieces of work rely on proxy variables to identify the informal sector, we use the official international definition of the informal sector elaborated by the ILO (1993), including all non-registered non-farm unincorporated enterprises (household businesses). Standard earnings equations are estimated at the mean and at various conditional quantiles of the earnings distribution. In particular, we estimate fixed effects quantile regressions to control for unobserved individual characteristics, focusing particularly on heterogeneity within both the formal and informal sectors employment categories. Our purpose is to address the important issue of heterogeneity at three levels: the worker level, taking into account individual unobserved characteristics; the job level, comparing wage workers with self-employed workers; and the earnings distribution. Ignoring distributional issues is indeed a strong limitation, given the compound question of how informality affects earnings inequality. A few studies still make use of quantile estimations to estimate informal–formal earnings gaps along the conditional earnings distribution (Bargain & Kwenda, 2011, 2014). While there is neither formalized theory nor any definitive consensus about why the formal–informal earnings gaps should vary along the income distribution (and, if so, in which direction), this assumption is nonetheless a key element of the debate exploring the exclusion *vs.* exit hypothesis (see Perry *et al.*, 2007, for an extensive discussion).

The remainder of this paper is organized as follows. Section 2 presents the context, the data and some descriptive elements of income dynamics in the recent period, while Section 3 focuses on the econometric approach to assess formal–informal earnings gaps. Empirical results are discussed in Section 4. Section 5 concludes.

2. CONTEXT, LABOR MARKET DYNAMICS AND DATA

(a) *Context*

After a long period of economic recession which started with the country's independence in 1960 and interrupted only by very short periods of growth, Madagascar experienced an exceptional period of economic expansion during 1997–2001. Several factors, both economic and political, drove this favorable development. Firstly, the political stability since the election of Didier Ratsiraka in 1996 and agreements with the Bretton Woods institutions to reduce debt created a favorable environment for investment. Secondly, the development of EPZs attracted foreign industry, in particular textile, which stimulated exports and employment. The rise of tourism also contributed to economic growth.

The presidential elections of December 2001 triggered a serious political crisis that lasted six months and had catastrophic economic effects (Razafindrakoto & Roubaud, 2002). The candidate Marc Ravalomanana challenged the first round results that he claimed were fraudulent. He maintained to have won the elections and refused the holding of a second round, against the incumbent president, Didier Ratsiraka. After huge demonstrations and general strikes, the conflict intensified as roadblocks around Antananarivo were set up by followers of Didier Ratsiraka in an attempt to paralyze the economy of the capital city. Finally, Marc Ravalomanana was proclaimed president in May, and Didier Ratsiraka left the country in July 2002.

The political crisis had disastrous effects on the economy: GDP collapsed by 12.7% and inflation was close to 16% in 2002 (Gubert & Robilliard, 2010). Exports and foreign direct investments fell sharply, unemployment rose by 71% between mid-2001 and the end of 2002 (Cling *et al.*, 2005). Despite the severity of the economic downturn, recovery was quick, with GDP growth of 9.8% in 2003 and around 5% in the two following years. However, unemployment doubled during 2001–05 and increased from 4.4% to 12% in the main urban areas. Income per capita in 2004 also remained under its pre-crisis level (Gubert & Robilliard, 2010).

These macroeconomic turbulences had a direct impact on the labor market dynamics and households living conditions. During 1997–2001, the growth process translated into a significant decline in the informal sector (Table 1). Accounting for 60% of employment in Madagascar's capital Antananarivo at the beginning of the period, its share decreased to 53% in 2001.[2] This drop occurred in a context of public administration and state enterprise downsizing, as part of the structural adjustment program. In terms of employment, this process mainly benefited the private formal sector. This structural change was mainly due to the rapid development of EPZ and at least to some extent to the expansion of formal domestic enterprises. The average annual growth rate of employment over the period was 27% in EPZ but only 3% in the informal sector. This led to a tripling of the share of EPZs in total employment during 1995–2001, from 3% to more than 10%, while the share of private formal sector jobs remained stable at 25% (Cling *et al.*, 2005).

The general strikes, roadblocks and the vacancy of power caused by the political crisis in the first half of 2002 reversed this trend. In only one year, the informal sector gained nearly 8 percentage points (Table 1), erasing all the progress in the formalization process observed during the previous four years, absorbing the laid-off workers from closing formal enterprises and the new entrants, deprived from any alternative source of jobs. While both dependent and independent informal sector employment increased, the growth in the number of informal entrepreneurs was much faster than the overall increase in the number of workers. This is a sign that informal sector employment growth is extensive rather than intensive, as it happens mainly through the creation of new firms rather than the expansion of employment in existing firms. Interestingly, in

Please cite this article in press as: Nordman, C. J. *et al.* Informal *versus* Formal: A Panel Data Analysis of Earnings Gaps in Madagascar, *World Development* (2016), http://dx.doi.org/10.1016/j.worlddev.2016.05.006