REVISITING INFORMAL EMPLOYMENT AND SEGMENTATION IN THE SOUTH AFRICAN LABOUR MARKET

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Abstract
This study revisits the definition of informal employment, and it investigates the puzzle of high open unemployment co-existing with relatively limited informal employment in South Africa. We estimate earnings equations using data from the September 2004 Labour Force Survey and present evidence of persistent earnings differentials not only between formal and informal employment, but also between types of informal employment. These persistent earnings differentials are suggestive of complex segmentation in the South African labour market and challenge the presentation of informal employment as an undifferentiated residual with no barriers to entry or mobility.
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1. INTRODUCTION

South Africa's labour market is distinctive, characterised by high rates of open unemployment and relatively limited informal employment. Other countries in Sub-Saharan Africa and economies with similar levels of per capita income in Latin America and Asia exhibit markedly different employment patterns. Specifically, other middle-income countries have higher rates of employment in the informal sector, measured by commonly used indicators, which help attenuate observed rates of open unemployment.[1] In these countries, underemployment replaces unemployment as the critical labour market challenge. This raises an important question: why is informal employment so low and open unemployment so high in South Africa?

This paper grapples with this question by revisiting patterns of labour market segmentation in South Africa. We define labour market segmentation as the existence of barriers to mobility within labour markets that prevent employed individuals from maximising the returns to their labour by switching to a more highly remunerated type of employment. We include a broader array of types of employment than typically is examined when considering questions of segmentation. In particular, informal employment is not conceptualised as a homogenous category. Rather, we explore the

[1] For example, Statistics South Africa (2006) estimates non-agricultural employment in the informal sector to have been 18.5% of total employment according to the September 2006 Labour Force Survey. The 2006 *Panorama Laboral*, published by the ILO Regional Office in Lima, estimates urban employment in the informal sector (excluding domestic workers) in 2005 to have been 35% of total employment in Costa Rica, 36.1% in Argentina, 38% in Mexico, 40.6% in Brazil, and 50.1% sin Paraguay.

possibility that informal labour markets are themselves segmented. Often, informal employment is treated as an undifferentiated residual with no barriers to entry – anyone willing to work at the prevailing rate of return is free to do so. However, one possible explanation for the low levels of informal activity in South Africa is that barriers to entry in informal labour markets are non-negligible.

Using data from the September 2004 Labour Force Survey, we look for evidence of segmentation across various categories of employment – between formal and informal employment, and within types of informal employment – in order to shed light on the employment puzzle in South Africa. The paper extends earlier work on segmented labour markets in South Africa (Hofmeyr, 2000), but it uses a definition of informal employment based on new international recommendations and specifically examines the possibility that barriers to mobility may exist within informal forms of employment.

Informal employment typically has been defined in terms of employment in the informal sector, with the informal sector being comprised of all informal enterprises. Informal enterprises are distinguished from formal enterprises by being unincorporated and by their registration status, size, or a lack of formal accounts (Hussmanns, 2004).[2] Therefore, employment in the informal sector represents an enterprise-based definition of informal employment. Official estimates of informal employment in South Africa, such as those published by Statistics South Africa, use an enterprise-based approach. Recently, an expanded definition of informal employment has been recommended by the 17th International Conference of Labour Statisticians (ICLS) which stresses employment in unprotected or unregulated jobs, not simply employment in informal enterprises (Hussmanns, 2004; Chen *et al.*, 2005). In practice, the recommendation of the 17th ICLS is often applied by defining informal employment outside the informal sector as employment that lacks a set of social protections and/or enforceable employment contracts.

In this paper, we consider an alternative definition of informal employment in South Africa that incorporates the recent recommendations of the 17th ICLS and extends the concept of informal employment beyond employment in informal enterprises. Specifically, we define informal employment in South Africa to include: (1) self-employment in informal enterprises and (2) employment in informal jobs. We use this definition to reveal some surprising trends in the levels and rates of change in informal employment, and to investigate econometrically the segmented nature of the South African labour market.

The paper is organised as follows. In the next section, we discuss the theoretical and empirical context for the research, in terms of dualist approaches to segmented labour markets and high rates of open unemployment in South Africa. We then consider different ways of identifying informal employment and we propose a broader measure than that traditionally adopted in South Africa, based both on enterprise and employment characteristics. We compare the different estimates of informal employment in South Africa, profiling working conditions and tracking recent changes in employment over time. Following this, we estimate earnings functions for workers across all employment types in order to discover if there is evidence suggestive of segmented labour

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[2] The 15th International Conference of Labour Statisticians developed recommendations for defining the informal *sector* which was based on enterprise characteristics and which could be used as a basis for incorporating informal production into the system of national accounts.

markets. Perfect labour mobility and the absence of barriers to entry for different types of employment should lead to equalisation of earnings after controlling for other factors, such as returns to human capital. Persistent conditional earnings differentials across different categories of employment are therefore consistent with a hypothesis of labour market segmentation. We conclude the paper with a summary of the results, a brief reflection on policy implications, and suggestions for further research.

2. CONTEXT

Labour markets in low- and middle-income countries are frequently described as dualistic. Dual labour markets are composed of two distinct sectors: a formal and an informal sector; a rural and an urban sector; or a "modern" and a "traditional" sector. The precise formulation of dual labour markets varies from application to application. Dual labour market theories have a rich history and have been used to shed light on a range of issues, including the persistence of informal employment, migration, open unemployment, economic growth, industrialisation, employment subsidies, and distributive outcomes (Lewis, 1954; Fei and Ranis, 1964; Todaro, 1969; Harris and Todaro, 1970; Stiglitz, 1974; Bourguignon, 1990; Fields, 2004).

Dualist theories of labour market segmentation frequently postulate that labour markets in the formal sector are characterised by wage rigidity in which wages remain above the market-clearing level – due to explicit regulatory interventions (*e.g.* minimum wage legislation), the market power of workers, or other imperfections in the formal wage labour market.[3] Labour market inflexibility creates a situation in which formal employment opportunities are rationed. Economically active individuals who are denied access to formal employment are able to work informally, in activities for which regulatory or distributive distortions are absent. In effect, labour markets clear in the informal or traditional sector in the sense that anyone who chooses can participate in these types of low-productivity or subsistence activities. That is, barriers to entry are absent in informal forms of employment.[4]

Dualist theories have been invoked to characterise the structure of South African employment. For example, Kingdon and Knight (2007:5) suggest that one way of describing the South African labour market is in terms of formal "insiders" and informal/ unemployed "outsiders" (see also UNDP 2003:160):

. . . formal sector employees can be regarded as "insiders", and residual workers, comprising those in the informal sector (which serves as a residual labour "sponge") and the unemployed, as "outsiders". South African insiders fall within the scope of the industrial relations regulations, including recognition of trade unions and collective bargaining, the right to strike, protection against dismissal, and minimum standards concerning hours of normal and overtime work, minimum wages and minimum leave provisions . . . The informal sector workers fall outside the labour regulation system.

However, typical dualist formulations present us with a puzzle in the South African labour market. If there are no barriers to entry into informal employment, why is open

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[3] For example, Stiglitz (1974) develops a model in which replacing workers is costly, thereby creating an incentive to keep wages above the market-clearing level in order to reduce turnover.
[4] Maloney (2004) also suggests that there are no barriers to entry into informal employment. Maloney's approach differs from dualist frameworks in that informal employment is freely chosen and not the result of employment rationing in formal labour markets.

Table 1. Unemployment in South Africa (weighted, 1000s), 2001-2004

	2001	2002	2003	2004
Unemployment (searching)	4,815	5,076	4,522	4,228
	(53)	(57)	(56)	(127)
Unemployment (searching + non-searching)	7,958	8,401	8,399	8,334
	(66)	(71)	(72)	(186)
Unemployment rate (searching)	29.76	30.67	28.09	26.40
	(0.29)	(0.30)	(0.31)	(0.58)
Unemployment rate (searching + non-searching)	41.18	42.26	42.05	41.42
	(0.29)	(0.30)	(0.30)	(0.58)

Notes: 1. Standard errors in parentheses. 2. Data are for individuals older than 15 years. 3. Data are weighted (using the new weights released by Statistics South Africa in 2006).
Source: Labour Force Surveys (LFS) 2001:2, 2002:2, 2003:2, 2004:2.

unemployment so high and employment in the informal sector so low? The unemployed theoretically could enter either informal wage- or self-employment. If demand-side constraints do not change, this should lower average earnings among informal workers, and reduce the rate of open unemployment. In this sense, informal employment acts as a residual sponge, "mopping up" a portion of the workers who would otherwise be unemployed. If this is often the case, why does informal employment absorb so few of the openly unemployed in South Africa?

Table 1 summarises the very high rates of open unemployment in South Africa, even when a "strict" definition of unemployment is used. There has been a modest fall in the number of searching unemployed from 2001, but this has been more than offset by an increase in the number of unemployed who are not actively looking for work. Given low labour absorption, it is possible that the decline in the number of searching unemployed is explained not only by a modest increase in employment, but also by the movement of the searching unemployed to non-searching unemployed, particularly if searching is not a costless activity.

One explanation for high open unemployment in South Africa could come from the labour supply side – the unemployed have reservation wages that exceed earnings in informal employment. When expected earnings fall below a particular threshold, often called the "reservation wage", individuals chose not to work. If expected earnings in informal employment fell below this level, job rationing in the formal sector would not lead to an increase in informal employment. Data on reservation wages are not sufficient to provide a conclusive evaluation of this possibility. Nevertheless, the empirical evidence that exists suggests it unlikely that "unrealistic expectations" adequately account for the levels and persistence of unemployment in the country.

Nattrass and Walker (2005), using regionally specific data, find that reported reservation wages of the unemployed were 15% lower on average than their predicted earnings. At the national level, questions about reservation wages were included only in two of the earliest household surveys.[5] Kingdon and Knight (2001) warn that caution must be exercised in interpreting the data collected. Using 1993 and 1994 household survey data, they find that at least half of the unemployed reported reservation wages in

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[5] These are the 1993 Project for Statistics on Living Standards and Development and the 1994 October Household Survey.

excess of their predicted wages; but they do not view the stated reservation wage as "a reliable criterion for judging willingness to work" (Kingdon and Knight, 2001:15). Rather, they suggest that other explanations "based on the reporting of expected rather than reservation wages and on lack of information" (2001:19) account for their results.

Although recent labour force surveys in South Africa have not asked about reservation wages directly, they have included questions asking why the unemployed are not working. Possible reasons provided include lacking "skills or qualifications for available jobs"; not being able to "find *any* work"; and not being able to "find *suitable* work (salary, location of work or conditions not satisfactory)" (emphasis in original, see *e.g.* Question 3.1 of the September 2004 Labour Force Survey, p. 11).[6] The overwhelming majority – about 80% in the September 2004 Labour Force Survey – report that they were not able to find *any* work. Only about 3% identify that they could not find "suitable" work.

In this paper, we explore another explanation for why informal employment in South Africa is not more prevalent. Instead of conceptualising informal employment as a residual form of employment with negligible barriers to entry, we look for evidence of limitations to labour mobility within the general category of informal employment, controlling for other determinants of earnings. This approach broadens the extent of labour market segmentation captured in dualist representations. Barriers to mobility may exist not only between formal and informal labour markets, but also into, and within, informal activities themselves.

3. DEFINING INFORMAL EMPLOYMENT

Informal employment has often been identified using an enterprise-based definition – informal employment is considered to consist solely of employment in informal enterprises. Several criteria are typically used to classify enterprises as formal or informal: does the enterprise maintain official accounts; is the enterprise registered with a government agency; or does the enterprise employ a small number of workers (typically less than five or less than ten)? However, the enterprise-based definition fails to capture adequately the number of individuals working in informal jobs – that is, in forms of employment that lack legal or social protections. Informal employment occurs outside of the informal sector when individuals are employed by households (*e.g.* domestic workers) or when individuals are employed in unprotected jobs in formal enterprises.

In South Africa, the Basic Conditions of Employment Act (BCEA) of 1997 provides a minimum standard of rights and protection for all those working at least 24 hours a month with a single employer (Department of Labour 1997). The BCEA entitles workers to paid leave, a written contract with employers and notice prior to dismissal. However, we only observe enforcement of the BCEA imperfectly in employment data collected in the nationally representative household surveys. Furthermore, although workers

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[6] Other questions include whether the unemployed have turned down any job offers, whether they know of any available work, for which they are qualified, but are not willing to do, and why not. Possible reasons for the latter question include "wages too low", "job not permanent" and "working conditions unsuitable". Less than 1% of the (broadly) unemployed in the unweighted sample (93 individuals) reported that they knew of available work which they were not willing to do; of these, 70 individuals provided reasons for their unwillingness, with 25 reporting "wages too low" as the reason.

Table 2. Sector of employment: alternative measures (unweighted numbers, % share), 2004

	Registration information Q4.17 a & d	Direct question Q4.18	Combining Q4.18 & Q4.17	Legal + employment benefits
	(1)	(2)	(3)	(4)
Formal employment	15,573	17, 535	17,622	15,623
	61.17%	68.87%	69.21%	61.65%
Informal employment	9,661	7,759*	7,673*	9,406
	37.94%	30.48%	30.14%	37.12%
Don't know/missing	226	166	165	314
	0.89%	0.65%	0.65%	1.13%

Note: Data are for individuals older than 15 years. * Includes all domestic workers.
Source: Labour Force Survey 2004:2.

employed in registered businesses are more likely than other workers to report having a written contract with their employer and receiving paid leave, the correspondence is far from perfect. In the September 2004 Labour Force Survey (LFS 2004:2), for example, almost 30% of the wage employed (working 24 hours or more a month) reported not having a contract with employers, and 37% reported not receiving paid leave. Among those employed in registered businesses, the measures were 20% and 30%, respectively.

In Table 2, we compare estimates of informal employment for South Africa derived using alternative definitions of informal employment with data from the LFS 2004:2. In research on South African labour markets, informal employment is most frequently defined using the enterprise-based approach, with formality determined by the registration status of enterprises. In some cases, domestic workers are included as informal workers; at other times they are treated separately. In the Labour Force Surveys, information on the registration status of enterprises is collected explicitly in question 4.17 parts a and d.[7] In the first data column of Table 2, we report the unweighted[8] measure of informal employment in the LFS 2004:2 derived using this information.

The Labour Force Surveys, however, also ask respondents *directly* if employment is formal or informal in the next question (4.18). This question seems commonly to be used by researchers in distinguishing formal from informal employment. Appended to question 4.18 is a definition of formal employment (the employer being "registered to perform the activity"). However, it is likely that responses to the direct question reflect the respondent's perceptions of whether the employment is formal or informal. This would explain significant differences in the size of the informal sector when measured using question 4.17, or question 4.18 (measure 2 in Table 2). About 14% of those classified with formal employment according to question 4.18 are also reported as working in a business that is not registered. Question 4.18 therefore produces a larger estimate of formal employment (69%), and a smaller estimate of informal employment, than is produced using questions 4.17a and 4.17d (61%).[9,10]

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[7] All the employed are asked whether the "the organisation/business/enterprise/branch where . . . works is a) a registered company or close corporation or . . . d) registered for VAT?"
[8] We use unweighted numbers here so that sample differences across the various definitions are easily identified.
[9] Note these figures include domestic workers in the estimate of informal employment.
[10] Not surprisingly perhaps, the degree of overlap between question 4.17a and d and question 4.18 is significantly lower for those in wage employment than in self-employment (*i.e.* would

Official statistics on informal and formal employment are based on question 4.18, which Statistics South Africa recognises in a recent release is a definition "guided by the self-perception of respondents" (Statistics South Africa 2006:10). However, many researchers analysing the national data sets may use a combination of information collected in questions 4.18 and 4.17. An example is reflected in the third measure in Table 2 where those "self-identified" as informally self-employed, but who also report their enterprise as registered, are re-coded as formal. Broadening the net to identify formal employment produces a slightly higher measure of formal employment and a lower measure of informal employment than question 4.18.

In the final column in Table 4, we use an alternative definition of informal employment, one that applies the recommendations of the 17th ICLS to the variables that are available in the Labour Force Survey – that is, we define informal employment in such a way to include both employment in informal enterprises and employment in informal jobs. We consider self-employment to be formal if the self-employed work in registered enterprises. Registration subjects formal self-employment to greater regulatory oversight, one example being stronger enforcement of tax collection. We consider wage employment to be formal if the worker has an employment contract or receives both paid leave and pension contributions. This definition perhaps most closely captures the distinction between formal as "protected" (or regulated), and informal, as "unprotected" (unregulated), employment. It also allows us to distinguish between formal and informal employment according to the characteristics of the employment relationship, rather than the occupation, industry, or the site of employment. For example, there is no need to pre-determine whether domestic workers are formal or informal – they are formal if they have an employment contract or receive paid leave and pension contributions.

The alternative definition of informality in employment produces a significantly larger measure of informal employment than that generated using question 4.18, because some 20% of the wage employed, who identified their employment as formal, also reported not having a contract or receiving benefits (paid leave and pension contributions). The alternative definition therefore suggests that informal employment accounted for a considerably bigger share of total employment than is typically measured in South Africa (37% rather than 30% in 2004).[11]

Do alternative definitions of informal employment have any implication for assessing employment trends in South Africa? Because of changes in survey design, a long-run comparison is not possible. Therefore, we restrict our attention to the short-run – specifically, we analyse the September LFSs, 2001-2004.[12] We compare the alternative measure based on the ICLS recommendations, with a measure typically used in South

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respondents know whether the employer has a registered business, particularly if reporting for others?) About 96% of the employed whose sector of employment is identified as formal but whose employer is reported as not being registered, are wage employees.

[11] It produces a measure of informal employment that is closest to the definition based on reported enterprise registration (measure 1 in Table 2). About 80% of employees whose employer was reported as registered were also reported with either an employment contract or with paid leave plus retirement benefits, accounting for the similarity between the two measures.

[12] The September 2000 LFS could be included in this analysis but we exclude it here for two reasons: (1) It is not strictly identical to the other September LFSs because it does not collect information on VAT registration (*i.e.* question 17 d) is excluded and only question 17a is included;

Table 3. Measuring sector of employment: typical and alternative measures (weighted, 1000's)

	2001		2002		2003		2004	
	Typical	Alternate	Typical	Alternate	Typical	Alternate	Typical	Alternate
Formal	7,973	6,307	8,195	6,807	8,335	7,416	8,500	7,592
	(62)	(60)	(63)	(61)	(65)	(63)	(219)	(210)
Informal*	3,234	4,789	3,192	4,499	3,184	4,004	3,300	4,059
	(40)	(47)	(46)	(52)	(46)	(50)	(87)	(104)
Domestic workers	872		852		899		876	
	(21)		(22)		(25)		(34)	

Notes: 1. Standard errors in parentheses. 2. Data are for individuals older than 15 years. 3. Data are weighted. 4. Numbers may not tally across definitions because of a differing number of unknowns for sector. * The typical measure includes domestic workers.
Source: Labour Force Surveys (LFS) 2001:2, 2002:2, 2003:2, 2004:2.

Table 4. Disaggregating employment trends (weighted 1000's), 2001-2004

	2001		2002		2003		2004	
	Employee	Self-employed	Employee	Self-employed	Employee	Self-employed	Employee	Self-employed
	Conventional definition							
Formal	7,370	602	7,591	604	7,717	618	7,834	616
	(61)	(23)	(62)	(22)	(63)	(24)	(201)	(45)
Informal*	1,737	1,496	1,608	1,584	1,679	1,505	1,668	1,602
	(31)	(29)	(32)	(36)	(35)	(33)	(55)	(55)
	Alternative definition							
Formal	5,753	553	6,251	554	6,817	574	7,033	559
	(58)	(22)	(60)	(21)	(62)	(22)	(193)	(43)
Informal	3,239	1,550	2,858	1,640	2,434	1,501	2,400	1,659
	(42)	(30)	(42)	(37)	(41)	(33)	(75)	(56)

Notes: 1. Standard errors in parentheses. 2. Data are for individuals older than 15 years. 3. Data are weighted. * Includes domestic workers.
Source: Labour Force Surveys (LFS) 2000:2, 2001:2, 2002:2, 2003:2, 2004:2.

Africa. We use a combination of question 4.18 and question 4.17 as representative of the latter (measure 3 in Table 2).

Table 3 summarises trends in formal and informal employment over this period. The data reported here show that, from 2001 to 2004, total employment increased by about half a million. According to the conventional definition, almost all this growth occurred in formal employment. Informal employment experienced only a small increase – accounting for less than 15% of the total employment growth – over the period. Measurements using the alternative definition reveal somewhat different trends. The overall increase in employment is still driven by the growth of formal employment, but, in this case, informal employment *contracted*. Both the absolute and relative size of informal employment declined over the period.

Table 4 gives us an idea of what lies behind the decline in informal employment measured using the alternative definition. According to the LFS data, there has been an increase in the number of wage employees who report working with employment contracts. In 2001, 52% of employees were reported as having a written contract with their employer; in 2004, this increased to 68%. In contrast, self-employment, both formal and informal, does not show a similar sustained trend. Despite year-to-year

and (2) relative to the other September LFSs, the 2000 survey appears to overestimate considerably the amount of informal employment – possibly due to miscounting of individuals in subsistence agriculture.

Table 5. Average hourly real earnings (2000 base year), 2001-2004

	2001		2002		2003		2004	
	Employee	**Self-employed**	**Employee**	**Self-employed**	**Employee**	**Self-employed**	**Employee**	**Self-employed**
Formal	18.80	38.72	18.43	47.70	17.53	57.63	17.86	43.09
	(0.34)	(2.24)	(0.65)	(11.25)	(0.28)	(11.35)	(0.49)	(2.88)
Informal	5.34	6.62	4.79	7.07	5.11	7.51	4.63	7.76
	(0.14)	(0.28)	(0.18)	(0.48)	(0.21)	(0.78)	(0.13)	(0.53)

Notes: 1. The regulatory definition distinguishes formal and informal employment. 2. Averages are conditioned on positive earnings being reported. 3. The data are weighted. 4. Standard errors in parentheses. 4. Earnings were deflated using the Consumer Price Index for 2000.
Source: Labour Force Surveys (LFS) 2000:2, 2001:2, 2002:2, 2003:2, 2004:2.

fluctuations in the estimates, self-employment appears to have remained at approximately the same level over this short interval.

These data, which show evidence of a formalisation of wage employment in recent years, seem surprising in light of research which suggests the growing casualisation of employment in South Africa (Muller and Esselaar, 2004; Devey *et al.*, 2006). However, we find also that the increase in the proportion of wage employees with written contracts has not been accompanied by an increase in the proportion with permanent employment. Although the share of casual employment did not change over the period, a growing percentage identified their employment as temporary or for a fixed period.[13,14]

Table 5 adds information about real earnings trends to this picture. Contrary to standard labour demand theory, real hourly earnings for informal wage earners – who are in jobs with fewer regulatory restrictions – have been falling along with employment. Real wages for formal employees have also been declining. This may indicate that the process of formalisation of wage employment may be occurring primarily among higher paid informal wage workers, thereby lowering average wage rates among both formal and informal employees. In contrast to these trends, real earnings among the informal self-employed have been rising. Those individuals in formal self-employment enjoy the highest rates of average remuneration of any employment category.

These trends provide additional insight into South Africa's peculiar employment situation. Despite persistently high rates of open unemployment, the net gain in employment opportunities has occurred in the more high cost, highly regulated segments of the labour market – partly due to the formalisation of informal wage employment. And despite weaker legal and social protections, informal employment has not expanded to reduce open unemployment. At the same time, real earnings from informal self-employment have increased on average, raising the question of why more individuals do not take advantage of these improved opportunities, particularly if barriers to entry are negligible. Constraints to labour mobility within labour markets may help explain the patterns of employment seen in South Africa. Therefore, we turn our attention to a more formal analysis of labour market segmentation.

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[13] In 2001, approximately 3.6% and 11.35% of wage employees reported their employment as either temporary or for a fixed period, respectively; in 2004, this has increased to 4.6% and 12.7%.
[14] Our alternative definition produces a better, or more consistent, match on the period of employment than the other definitions. For example, about 91% of those with formal employment defined using measure 4 report their employment as permanent, compared to 83% when formal employment is defined using measure 3 in Table 2.

4. EARNINGS DIFFERENTIALS AND LABOUR MARKET SEGMENTATION: ECONOMETRIC ESTIMATES

If we adopt the assumption, common in the segmentation literature, that individuals maximise the utility of the earnings they receive, hourly earnings should be equal across types of employment under conditions of complete labour mobility, controlling for individual characteristics that affect productivity, such as experience and education. In contrast, persistent earnings differentials are one indication of barriers to labour mobility, between the formal and informal economy, but also between types of informal employment. That is, the returns to labour will differ between workers of equal potential productivity within a segmented labour market (Magnac, 1991). In this section, we examine the determinants of earnings in the South African labour market and take persistent earning differentials between individuals with similar levels of human capital and work experience, among other controls, as suggestive of barriers to mobility.

We use the alternative definition of informal employment,[15] discussed at length above, to differentiate formal and informal employment within specific employment status categories. Table 6 summarises the distribution of employment, as well as average hourly

Table 6. Distribution of employment by sex and employment type, hourly earnings and hours worked, 2004 (alternative definition of informal employment)

	Distribution of employment		Average hourly earnings & weekly hours worked	
	N	%	Earnings	Hours
Formal				
Non-agricultural, private employee	8,778	34.49	16.49	45.91
			(21.70)	(10.95)
Non-agricultural, self-employed	830	3.26	41.13	51.85
			(51.80)	(17.42)
Agricultural, employee	1,586	6.23	6.30	49.04
			(9.38)	(10.67)
Agricultural, self-employed	240	0.94	61.80	51.2
			(132.22)	(17.17)
Public, employee	4,211	16.54	29.25	42.20
			(25.11)	(9.69)
Informal				
Non-agricultural, private, employee	4,435	17.42	5.43	43.64
			(6.75)	(17.20)
Non-agricultural, self-employed not own account	720	2.83	11.69	46.74
			(20.57)	(20.41)
Non-agricultural, self-employed own account	1,984	7.79	7.14	42.79
			(16.35)	(22.60)
Agricultural, employee	1,112	4.37	3.62	19.16
			(5.61)	(12.95)
Agricultural, self-employed	958	3.76	1.41	28.85
			(6.77)	(17.11)
Public, employee	254	1.00	8.09	40.69
			(10.66)	(15.26)
Don't know	345	1.36	2.65	43.03
			(8.29)	(22.68)
Total	25,453	100.00	14.73	44.38
			(25.37)	(15.12)

Notes: 1. Average earnings are conditioned on positive hours worked (and less than 140 hours a week) and on positive earnings reported. 2. The data are not weighted. 3. Standard deviations are in parentheses.
Source: Labour Force Survey 2004:2.

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[15] Our results, however, are not contingent on this definition.

earnings and hours worked, across these different categories in South Africa using data from the LFS 2004:2.

Formal and informal, non-agricultural, wage employment are the two most important categories of employment in South Africa, accounting for over half of total employment in 2004 (34% and 17% respectively). Average earnings are significantly higher in formal employment than in informal employment, consistent with segmentation along formal/informal lines. In addition, earnings differentials are apparent *within* the general categories of "formal" and "informal" employment.

These observed patterns in average earnings could be caused by measurable differences among individual workers and not by structural barriers to labour mobility. For example, it could be that individuals with limited human capital are concentrated in the lowest paid forms of employment and the patterns identified simply represent the returns to different endowments of skills and experience. Furthermore, other constraints outside of the labour market may limit mobility and produce employment patterns in which otherwise equivalent workers receive different earnings for an hour's work. For example, imperfections in credit markets can prevent individuals from undertaking investments that would raise the returns to their labour or from managing financial risks.

Inequality in earnings therefore is not sufficient to demonstrate labour market segmentation. What is needed is evidence of barriers to labour market mobility which prevent some individuals from taking advantage of employment opportunities available to others with similar characteristics (Günther and Launov, 2006).

A simple approach for examining earnings differentials is to estimate earnings functions for employed individuals and see if earnings differentials across defined labour market segments persist, controlling for individual and other characteristics that may influence the returns to labour. We estimate a standard Mincerian earnings equation, using Ordinary Least Squares (OLS), where the logarithm of hourly employment earnings is the dependent variable. Earnings derived from the LFS data have a number of short-comings which need to be acknowledged before earnings equations are estimated. In particular, the LFS does not impute earnings for the value of production for own-consumption. Therefore, many employed in subsistence agriculture report zero earnings. Furthermore, a significant number of respondents do not disclose their earnings.

In the LFS 2004:2, which we analyse here, about 5% of our sample report zero earnings for employment (although they worked 28 hours a week on average). A further 7% have no, or missing, earnings data. Almost all (98%) of those with zero earnings are in informal employment, and the majority (about 80%) in agricultural employment. In contrast, individuals who fail to disclose their income disproportionately work in formal employment (accounting for about 80% of those with missing earnings data).

Excluding very low income earners in informal employment and high income earners in formal employment is likely to produce biased regression coefficients in our estimations. Specifically, we would expect earnings differentials between formal and informal employment to be understated. To address this problem we impute earnings for the employed with zero or missing earnings data, using information from the sample of the employed for whom positive earnings are reported. In Table 7 we describe average earnings for those with nonzero earnings, and imputed average earnings for the samples with zero and missing earnings. The employed who report zero earnings are estimated to

Table 7. Average earnings, 2004

Sample	Average earnings (standard deviation)
Positive earnings reported	15.42 (25.74)
Zero earnings	4.13 (5.07)
Missing earnings	19.48 (14.44)

Source: LFS 2004:2.

earn well below the average for positive reported earnings, in contrast to those who do not disclose earnings information, who are higher-than-average income earners.

Table 8 summarises the OLS estimates of the coefficients of a pooled earnings function that incorporates fixed effects for the labour market segments. By adopting this approach, we make the strong assumption that a common earnings function exists across the different categories of employment – an assumption that we later relax. We report the results both for the sample with non-missing, positive earnings (regression (1)), and for the sample with imputed values for zero or missing earnings (regression (2)). Dummy variables are used to control for the same set of employment categories shown in Table 6 (formal non-agricultural wage employment is the omitted category).

The standard explanatory variables typically included in Mincerian equations – *e.g.* age, age squared, education, literacy – have coefficients with the expected signs and statistical significance. Returns to education beyond primary education are positive and increasing with the level of education. In the pooled regression, access to formal credit also has a significant positive relationship to earnings, suggesting that credit market imperfections would impact labour market outcomes. The estimations show further that women have significantly lower earnings than men, controlling for human capital and type of employment. This suggests that women are disadvantaged in all forms of market employment, not simply wage employment. Responsibility for non-market child care work does not appear to explain the negative gender effect. The presence of children under 7 years of age has an independent negative effect on earnings.

The signs of the estimated coefficients for the employment categories are consistent across the two different samples. As expected, increasing the sample size and imputing values for those with zero or missing earnings mostly strengthens the significance of our estimates, increasing the size of the coefficients for categories of formal employment and decreasing those for categories of informal employment.

In general, formal employment has significantly higher earnings than informal employment – a finding consistent with the predictions of dual labour market theories. The one exception to this pattern is formal agricultural wage employment. However, we are also interested in examining evidence of segmentation within categories of informal employment. Table 9 reports the F-test statistics for pair-wise comparisons of coefficient differences within categories of informal employment, based on the results of Regression 2 of Table 8. In almost all cases, the hypothesis of equality of coefficients can be rejected with at least 95% confidence. There are two exceptions: (1) private non-agricultural informal wage employees and public informal wage employees and (2) agricultural informal wage employees and agricultural informal self-employment.

The estimates and statistical tests presented in Tables 8 and 9 are based on a critical assumption: that the pooled regression model is an appropriate characterisation of the labour market in South Africa. Studies of segmented labour markets, however, typically have assumed that earnings functions differ across labour market segments (Dickens and

Table 8. Estimated earnings regressions, 2004

	(1)	(2)	(3)
Formal non-agricultural, self-employed	0.233*	0.386*	0.385*
	(0.065)	(0.051)	(0.049)
Formal agricultural, employee	−0.644*	−0.616*	−0.505*
	(0.031)	(0.033)	(0.033)
Formal agricultural, self-employed	0.051	0.352*	0.501*
	(0.165)	(0.121)	(0.125)
Formal public, employee	0.331*	0.270*	0.306*
	(0.025)	(0.021)	(0.021)
Informal non-agricultural, private, employee	−0.602*	−0.666*	−0.637*
	(0.025)	(0.025)	(0.023)
Informal non-agricultural, self-employed not o.a.	−0.350*	−0.423*	−0.406*
	(0.065)	(0.061)	(0.059)
Informal non-agricultural, self-employed o.a.	−0.783*	−0.870*	−0.830*
	(0.042)	(0.040)	(0.040)
Informal agricultural, employee	−0.940*	−0.966*	−0.853*
	(0.033)	(0.033)	(0.035)
Informal agricultural, self-employed	−1.123*	−1.032*	−0.917*
	(0.184)	(0.046)	(0.046)
Informal public, employee	−0.562*	−0.653*	−0.558*
	(0.068)	(0.057)	(0.057)
Age	0.042*	0.035*	0.034*
	(0.005)	(0.004)	(0.004)
(Age squared)/100	−0.384*	−0.284*	−0.280*
	(0.069)	(0.054)	(0.052)
Literate (read and write in at least one language)	0.177*	0.198*	0.175*
	(0.028)	(0.026)	(0.026)
Completed primary education (only)	0.034	0.034	0.027
	(0.034)	(0.032)	(0.032)
Incomplete secondary education	0.194*	0.234*	0.209*
	(0.025)	(0.023)	(0.023)
Completed secondary (matric) education	0.548*	0.702*	0.658*
	(0.030)	(0.030)	(0.029)
Post-secondary education	1.063*	1.244*	1.209*
	(0.037)	(0,.034)	(0.032)
Female	−0.286*	−0.269*	−0.265*
	(0.015)	(0.014)	(0.013)
Married	0.147*	0.229*	0.240*
	(0.018)	(0.017)	(0.016)
Children younger than 7 years in household	−0.029**	−0.046*	−0.037*
	(0.011)	(0.010)	(0.010)
Accessed formal credit	0.253*	0.396*	0.361*
	(0.029)	(0.026)	(0.026)
Accessed informal credit	−0.163*	−0.199*	−0.168*
	(0.024)	(0.023)	(0.022)
Living in a metropolitan area			0.275*
			(0.020)
R^2	0.58	0.58	0.60

Notes: 1. Standard errors in parentheses. 2. The omitted categories are for Africans with less than completed primary education working in formal sector, non-agricultural, private wage employment. 3. The estimation also includes variables for race (with Africans as the omitted category) although these are not reported in the table. Estimated coefficients for Whites, Indians and Coloureds are all positive and significant (and in declining order of magnitude). 4. The sample in (1) includes all the employed aged 15 years and older for whom positive earnings were reported, and in (2) and (3), it includes imputed values for those with zero or missing earnings data. 5. * significant at 1% level; ** significant at 10% level.

Table 9. Testing coefficient differences, informal employment only – Equation 2 (no metro specification), P-values in parentheses

	6. Private, non-agric, wage	7. Non-agric, self, not own-account	8. Non-agric, self, own-account	9. Agric, wage	10. Agric, self
7. Non-agric, self, not own-account	14.91 (<0.001)				
8. Non-agric, self, own-account	24.50 (<0.001)	41.07 (<0.001)			
9. Agric, wage	72.14 (<0.001)	65.15 (<0.001)	4.08 (0.043)		
10. Agric, self	58.34 (0.001)	67.03 (<0.001)	8.33 (0.004)	1.71 (0.191)	
11. Public, wage	0.04 (0.836)	8.16 (0.004)	10.80 (0.001)	24.52 (<0.001)	29.01 (<0.001)

Note: The sample includes imputed earnings for those with zero or missing earnings data.

Table 10. Predicted log hourly earnings across informal employment types, 2004

	6. Private, non-agric., wage employee	7. Non-agric., self, not own-account	8. Non-agric., self, own-account	9. Agric., wage employee	10. Agri., self	11. Public, wage employee
6. Private, non-agric., wage	**1.460** **(0.008)**	1.647* (0.011)	1.263 (0.010)	1.180 (0.014	1.038 (0.007)	1.406 (0.011)
7. Non-agric., self not own-account	1.643 (0.021)	**1.925** **(0.026)**	1.507 (0.026)	1.273 (0.042)	1.209 (0.016)	1.649 (0.030)
8. Non-agric., self, own-account	1.482* (0.011)	1.684* (0.016)	**1.297** **(0.014)**	1.160 (0.015)	1.087 (0.009)	1.444* (0.017)
9. Agric., wage	1.310* (0.012)	1.493* (0.018)	1.135* (0.016)	**0.983** **(0.012)**	0.968 (0.012)	1.142* (0.018)
10. Agric., self	1.380* (0.019)	1.454* (0.026)	1.214* (0.022)	0.977 (0.016)	**1.001** **(0.015)**	1.227* (0.027)
11. Public, wage	1.592 (0.032)	1.782 (0.039)	1.392 (0.036)	1.224 (0.043)	1.106 (0.023)	**1.643** **(0.047)**

Notes: 1. The data are weighted. 2. Standard errors are in parentheses. 3. The bold diagonal represents reported average earnings in each employment type. * Expected means are significantly larger at a 95% confidence level.
Source: LFS 2004:2.

Lang, 1985; Heckman and Hotz, 1986; Hofmeyr, 2000; Günther and Launov, 2006). We test whether a common earnings function finds support in our data using standard Chow test procedures. The resulting F statistics clearly show that the assumption cannot be upheld across all labour market segments (F = 523), or across informal employment specifically (F = 30). We therefore investigate whether evidence of persistent earnings differentials remains robust in an unrestricted model where individual earnings functions are allowed to differ across the segments.

We estimate separate earnings functions for the 11 categories of employment, including imputed values for zero or missing earnings observations. (The results for the categories of informal employment are presented in the Appendix.)[16] These separate earnings equations are then used to predict average expected earnings (expressed in natural logarithms) that would arise if individuals were to move from their current employment type to a different employment category. The predicted log hourly earnings for types of informal employment are summarised in Table 10. The rows of Table 10 represent the characteristics of currently employed individuals and the columns represent

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[16] The results of the separate earnings estimates for categories of formal employment are not presented here but are available on request.

Table 11. Predicted log hourly earnings in formal non-agricultural employment for individuals currently in informal employment, 2004

Informal employment	Formal employment		
	1. Private non-agric. wage employee	**2. Non-agric. self-employed**	**5. Public wage employee**
6. Private non-agric. wage employee	2.069*	2.584*	2.471*
	(0.011)	(0.013)	(0.009)
7. Non-agric., self, not own-account	2.331*	2.751*	2.653*
	(0.029)	(0.029)	(0.024)
8. Non-agric., self, own-account	2.135*	2.560*	2.499*
	(0.015)	(0.017)	(0.013)
9. Agric. wage employee	1.874*	2.324*	2.280*
	(0.016)	(0.023)	(0.013)
10. Agric. self	2.004*	2.380*	2.337*
	(0.025)	(0.030)	(0.022)
11. Public wage employee	2.281*	2.694*	2.627*
	(0.045)	(0.047)	(0.035)

Notes: 1. The data are weighted. 2. Standard errors are in parentheses. * The expected means are significantly higher than current average earnings at a 95% confidence level.
Source: LFS 2004:2.

the earnings function for the category in question. For example, the third row of Table 10 shows the predicted expected earnings of individuals, currently employed as informal non-agricultural own-account workers, in various types of informal employment. For this group of workers, average earnings would be lower if they moved into agricultural employment. However, this group of workers would raise their expected earnings if they could move into informal wage employment (public or private) or if they were able to remain self-employed, but move beyond own-account operations.

The results described in Table 10 confirm that there are persistent earnings differentials among categories of informal employment after controlling for observable characteristics and after relaxing the overly restrictive assumption of a common earnings function for the entire labour market. This evidence is consistent with the existence of barriers to mobility into and within informal types of employment. These barriers exist despite negligible rates of unionisation among those in informal employment and a relatively high degree of labour market flexibility. Among categories of informal non-agricultural employment, individuals who are self-employed, but not own-account workers, have the highest predicted average hourly earnings, controlling for individual characteristics. Informal wage employees, both public and private, come next in the earnings ranking, followed by self-employed, own-account workers.

Table 11 presents estimates of predicted earnings similar to those contained in Table 10, but focuses on the expected average earnings of informal workers if they were able to move into one of the three categories of non-agricultural formal employment. In all cases, predicted earnings are greater in formal employment than in informal employment. Therefore, the analysis also supports the traditional dualism argument – that earnings are higher in formal employment and barriers to mobility prevent workers from maximising the expected returns to their labour.

Studies of segmented labour markets often include a correction for sample selection bias in the earnings estimations (Dickens and Lang, 1985; Heckman and Hotz, 1986; Magnac, 1991). Such corrections require that the variables that explain selection into a particular employment type (*e.g.* informal employment) are independent of those variables used to explain earnings. An incorrectly specified selection model will not

improve the accuracy of the estimated earnings equations and can generate distorted estimates. The variables available to us from the Labour Force Survey to explain selection would also influence expected earnings. Therefore, we do not pursue this estimation strategy here.[17]

We recognise that our earnings estimates will be biased if there are unobservable elements which affect both the likelihood of an individual being in a particular segment of the labour market, and earnings. If there is negative selection into informal employment, for example, then we would expect our estimated coefficients for the informal employment variables to be biased downwards. This certainly warrants further investigation using panel data as these become available. However, we think it unlikely that unobserved effects will adequately account for earnings differentials identified here between the various types of informal employment.

5. DISCUSSION

We have shown that the definitions used to identify and measure informal employment have important implications for understanding labour market dynamics in South Africa. Using a definition that adopts and adapts the recommendations of the ICLS reveals that informal employment accounts for a larger share of total employment than is typically found. Moreover, this share has been declining in recent years, despite low levels of regulatory controls and falling real earnings. These findings are striking in the context of widespread open unemployment. Not only has informal employment failed to "mop up" surplus labour in South Africa, but its capacity to do so appears to have diminished from 2001 to 2004.

Labour market segmentation – throughout the entire labour market – helps to explain these surprising dynamics. Using data from the September 2004 Labour Force Survey, we found evidence which is consistent with complex segmentation in the South African labour market. As predicted by dualist theories, there are significant earnings differentials between formal and informal employment. But we also find significant earnings differentials between different types of informal employment. One explanation for these differentials is that they reflect barriers to entry and mobility, not only into the formal labour market, but also within the informal labour market. These barriers, in turn, may be important contributing factors explaining South Africa's high rates of open unemployment.

This study has focused on whether the quantitative evidence is consistent with the existence of complex segmented labour markets in South Africa. Certain factors – which may be considered to be located outside of the labour market – contribute to observed earnings differentials, such as the level of human capital and access to formal credit markets. However, other factors that limit mobility, perhaps more closely tied to the operation of the labour markets, cannot be observed directly from the LFS dataset. Other research studies using different methodologies help to fill in the picture.

For example, Chandra and Nganou (2001) analyse survey results among self-employed operators of small and micro enterprises in Johannesburg and find that the vast majority

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[17] Hofmeyr (2000) uses a selection model to examine patterns of labour market segmentation in South Africa. However, the exogenous variables chosen to explain selection (such as marital status) also impact earnings, a possible short-coming of that analysis.

entered self-employment from formal wage employment. Lack of personal savings or business experience may present barriers to entry into self-employment. Along similar lines, Cichello *et al.* (2006) find that crime, a lack of risk management tools, and insufficient start-up capital are barriers to self-employment in Khayelitsha township.

Another study of low-income neighbourhoods in the Cape Town metropolitan area revealed that working knowledge of English or Afrikaans improves access to employment opportunities and labour market information (Deumert and Mabandla, 2006). Similarly, studies outside of South Africa have found that social capital and networks are important in determining access to opportunities within the informal economy (Hart, 1973; Collier and Garg, 1999; Barr and Oduro, 2000). Although this literature is suggestive, clearly more research into the determinants of labour market segmentation is needed to flesh out the findings highlighted here.

Our research takes into account measurable differences in individual characteristics which may influence earnings. However, the cross-sectional analysis of the Labour Force Survey does not adequately address the possibility that unobserved individual attributes are influencing the results. Panel data which contain information on the same individuals over time are needed to examine the impact of unobserved effects. This is a limitation of the current study and an area for future research. Nevertheless, the results we present in this paper represent an important first step in exploring these issues.

We recognise that there are explanations, apart from labour market segmentation, which could produce the outcomes we document in this paper. Perhaps most significant is the possibility that there are non-pecuniary benefits to certain types of employment that compensate for wage differentials. That is, the non-monetary aspects of a job could make up for lower earnings. In the context of this paper, a complete absence of segmentation would imply that the non-pecuniary benefits of informal forms of employment are enough to compensate for the significantly higher earnings associated with formal employment. This is doubtful. Nevertheless, we do not currently have adequate controls for the non-pecuniary aspects of different forms of employment to rule out the possibility that compensating differentials may influence our results.

Our research does suggest that barriers to labour mobility and patterns of segmentation are potentially critical issues to be incorporated into the formulation of employment policy in South Africa. If employment and labour market outcomes are to play a role in reducing income inequality and poverty, then barriers which prevent individuals from taking advantage of economic opportunities as they emerge must be identified and their adverse effects minimised. Without such efforts, policies that are successful in increasing gainful employment may fail to enhance equity and improve the welfare of economically disadvantaged communities.

APPENDIX

Table 12. Estimated earnings regressions by category of informal employment

	6. Private, non-agricultural, wage	7. Non-agricultural, self, not own account	8. Non-agricultural, self, own account	9. Agricultural, wage	10. Agricultural, self	11. Public, wage
Age	0.016*	0.084*	0.022	0.036*	0.031*	0.071*
	(0.009)	(0.028)	(0.019)	(0.011)	(0.008)	(0.023)
(Age squared)/100	−0.090	−0.887*	−0.129	−0.401*	−0.271*	−0.677*
	(0.114)	(0.332)	(0.222)	(0.145)	(0.079)	(0.255)
Literate	0.244*	0.103	0.191	0.158*	0.118*	0.258
	(0.052)	(0.220)	(0.102)	(0.057)	(0.049)	(0.187)
Completed primary education (only)	0.057	0.296	−0.176	0.137*	−0.054	0.488*
	(0.058)	(0.206)	(0.137)	(0.070)	(0.085)	(0.189)
Incomplete secondary education	0.187*	0.437*	0.200*	0.078	0.250*	0.496*
	(0.043)	(0.188)	(0.089)	(0.062)	(0.044)	(0.139)
Completed secondary education (only)	0.463*	0.835*	0.631*	0.601*	0.205	0.740*
	(0.057)	(0.202)	(0.108)	(0.150)	(0.295)	(0.154)
Post-secondary education	1.018*	1.115*	1.014*	0.026	0.407	1.816*
	(0.157)	(0.262)	(0.190)	(0.377)	(0.410)	(0.176)
Female	−0.241*	−0.557*	−0.432*	−0.001	−0.279*	−0.268*
	(0.031)	(0.107)	(0.069)	(0.048)	(0.046)	(0.103)
Married	0.164*	0.318*	0.203*	0.008	0.243*	0.082
	(0.038)	(0.118)	(0.072)	(0.033)	(0.058)	(0.116)
Children < 7 years in household	−0.081*	−0.025	−0.028	0.007	−0.021	−0.026
	(0.021)	(0.068)	(0.037)	(0.063)	(0.023)	(0.055)
Accessed formal credit	0.491*	−0.035	0.617*	2.075*	0.367	0.623*
	(0.127)	(0.190)	(0.205)	(0.481)	(0.334)	(0.214)
Accessed informal credit	−0.091*	−0.310*	−0.260*	−0.224*	−0.274*	0.072
	(0.040)	(0.143)	(0.082)	(0.063)	(0.087)	(0.109)
R^2	0.16	0.20	0.14	0.19	0.26	0.43

Notes: 1. The data are weighted. 2. Standard errors are in parentheses. 3. The sample in includes all the employed aged 15 years and older. Earnings values have been imputed for those with zero or missing earnings data. * The expected means are significantly higher than current average earnings at a 95% confidence level.
Source: LFS 2004:2.

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