Defining and Measuring Informal Employment in South Africa:
A Review of Recent Approaches

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# A review of recent approaches

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ABSTRACT

There is limited consensus on how to define informal employment in South Africa, but the three general approaches in the South African and international literature to capture informal employment are the enterprise, employment relationship, and worker characteristics approaches. This paper reviews Statistics South Africa's methodologies to measure informal employment before and after the introduction of the Quarterly Labour Force Survey (QLFS), and other recently proposed approaches, before investigating the congruence, if any, between five measures of informality in 2009. It is found that 94.7% of the self-employed are informal according to at least one definition, but only 62.6% according to all five. In addition, these two proportions are only 67.7% and 6.9% respectively in the case of informal employees. Econometric analysis is conducted to further investigate the differences in these measures.

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# 1.    INTRODUCTION

Since Hart (1973) first introduced the concept 'informal sector' in the early 1970s, there has been considerable debate about what exactly the term informal economy[2] refers to, as well as the appropriate way to measure informal employment. However, defining the informal employment, and its ensuing measurement, has been problematic, both domestically and internationally. In addition, since every country has unique features and circumstances, a universally accepted definition of informal employment is hard to come by.

Traditionally, informal employment in a developing country is seen as a possible alternative when formal employment opportunities are limited (Fields, 1975; Mazumdar, 1976; Bernabè, 2002). It is also a survivalist strategy for people with deficient human capital, the retrenched from the formal economy due to economic downturn or structural adjustment, people who voluntarily leave the formal jobs to be engaged in informal work for flexibility of balancing home and income-raising responsibilities, and entrepreneurs who prefer to operate informally so as not to be subject to the same set of regulations and taxation as formal enterprises[3] (Kershoff, 1996; Anderson, 1998; Palmade and Anayiotos, 2005; Perry et al., 2007). Furthermore, informal employment allows the labour market to clear more easily, since the informal sector is less subject to certain labour market rigidities (Kingdon and Knight, 2004 & 2007).

In contrast, it is argued (Mazumdar, 1976; Blunch et al., 2001; Henley et al., 2009) that due to inferior earnings, fringe benefits and job security as well as a significant extent of under-employment, the size of informal employment provides an indicator of the scale of poor working conditions. Hence, two important policy concerns are to reduce the size of informality and to widen the base of direct taxation. Further policy concerns relate to the extent to which open unemployment is a precise indicator of labour market performance, if unemployment is actually partly hidden in the informal economy.

In South Africa, until 2007, the enterprise approach as proposed in the 15th International Conference of Labour Statisticians (ICLS)[4] of the International Labour Organization (ILO) in 1993 was adopted by Statistics South Africa (Stats SA) to define informal employment as workers in informal sector or enterprises in the 1995-1999 October Household Surveys (OHSs)[5] and 2000-2007 Labour Force Surveys (LFSs). Given the slow employment creation in the formal economy, it is typically expected that South Africa should have a relatively large size of informal

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[2] The informal sector is increasingly being referred to as the informal economy so as to get away from the idea that informality is confined to a specific sector of economic activity but rather cuts across many sectors. In addition, the informal economy emphasizes the existence of a continuum from the informal to the formal ends of the economy and hence the interdependence between the two sides (Flodman Becker, 2004:8).

[3] This is also known as the legalists' view on the informal economy. [3] Over the years, the diverging views on the informal economy are categorized into three main schools of thought: the dualist school, the structuralist school and the legalist school. Dualists view the informal units and activities have few (if any) linkages to the formal economy but, rather, operate as a distinct separate sector of the economy. In contrast, structuralists see the formal and informal economies as intrinsically linked, with the latter comprising small firms and unregistered workers, subordinated to large capitalist firms. In addition, legalists claim that the informal economy comprises micro-entrepreneurs who prefer to operate informally so as to avoid the costs associated with registration (Bacchetta et al., 2009: 40 & Chen, 2007: 7).

[4] In the 15th ICLS in 1993, informal employment was defined as comprising 'all jobs in informal sector enterprises, or all persons who, during a given reference period, were employed in at least one informal sector enterprise, irrespective of their status in employment and whether it was their main or secondary job", with informal sector enterprises meaning private unincorporated enterprises, i.e., enterprises that are "not constituted as separate legal entities independently of their owners, and for which no complete accounts are available that would permit a financial separation of the production activities of the enterprise from the other activities of its owner(s)' (Hussmanns, 2005:3). Furthermore, it was suggested that the employment size in the informal sector enterprises should be defined as those with less than five employees.

[5] The formal/informal sector status of the employed could only be defined in the case of self-employed in OHS 1995-1996 (Essop & Yu, 2008a: 7-8).

employment. However, South Africa is an international outlier with regard to the size of this employment against other comparable countries (Kingdon and Knight, 2004; Essop and Yu, 2008a), that is, South Africa is characterised by high unemployment but low informal employment.

Various reasons have been advanced for the relatively low informal employment in South Africa: There are barriers of entry to the informal economy, such as crime, lack of access to finance, infrastructure, training, as well as insufficient government support to promote microenterprises and the informal sector (Rogerson, 2004; Kingdon and Knight, 2004 & 2007); informal employment is under-captured due to the imperfect questionnaire design and indicators used in the Stats SA 1995-2007 enterprise-based methodology (Devey et al., 2003, Muller, 2003; Essop and Yu, 2008a); and this approach hides a significant degree of informality in the formal economy, as some formal jobs are characterised by conditions that are typical of informal work (Devey et al., 2006; Essop and Yu, 2008a). With regard to the last reason, alternative approaches to define informal employment are suggested (e.g., Devey et al, 2006; Heintz and Posel, 2008; Essop and Yu, 2008b), by taking the nature of employment relationship into consideration, as proposed in the 17th ICLS[6] in 2003. In other words, according to this view, informal employment should also include people employed outside the informal sector who display informal characteristics, most notably the lack of social and legal protection in employment (Hussmanns, 2005).

With the introduction of the Quarterly Labour Force Survey (QLFS) since 2008, Stats SA defined informal employment in two ways, namely employment in the informal sector, and informal employment which includes both informal sector workers and informal employment outside the informal sector. Thus, the following questions arise: Which Stats SA methodology measures informal employment more properly? Would the recently proposed alternative methodologies as mentioned above still be applicable in the QLFS, and would they result in a much larger estimate of informal employment? Would different workers be identified as informal in each methodology? Furthermore, recent international studies (e.g., Gasparini & Tornarolli, 2007; Henley et al., 2009) recommend that worker characteristics such as educational attainment, earnings and occupation should be considered when distinguishing informal workers. This leads to two further questions: Could such a worker approach to define informal employment be applied to South Africa, and what is the estimated size of the informal employment if it is possible to do so?

The remainder of the paper is structured as follows: Section 2 reviews the official and recently proposed alternative methodologies to define informal employment in South Africa. In Section 3, the degree of coincidence of different measures of informal employment is examined, before econometric techniques are used in Section 4 to investigate the commonalities and differences in the way in which these measures of informality are associated with the demographic, education, employment and household characteristics of the workers. Section 5 provides conclusions. In the subsequent analysis, those employed whose broad industry category is either agriculture/hunting/forestry/fishing or private households are excluded. In addition, only the working-age population (15-65 years) are included.

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[6] In the 17th ICLS, it was proposed that informal employment should be defined as the total number of informal jobs, whether carried out in formal sector enterprises, informal sector enterprises, or households (Hussmanns, 2005:4-6). In addition, it was proposed that employees holding formal jobs in informal sector enterprises should be excluded from informal employment.

## 2. DEFINING INFORMAL EMPLOYMENT

Until 2007, Stats SA adopted the enterprise approach to define informal employment as only those working in the informal sector, as shown in Figure 1. The direct, self-perception question on the formal/informal sector status was the only criterion used to distinguish informal workers, for both the self-employed and employees (Essop and Yu, 2008a: 7). However, it is argued (Muller, 2003: 6-9; Stats SA, 2006: 10; Heintz and Posel, 2008: 30-32) that respondents' answer to this question might not give reliable estimates, and other indicators should be considered to define informal employment more precisely. Hence, alternative definitions of informal employment have been proposed by various researchers, most notably Heintz and Posel (2008), Devey et al. (2006), and Essop and Yu (2008b).

Figure 1: Stats SA's methodology to derive different categories of formal and informal sector workers, 1995 – 2007
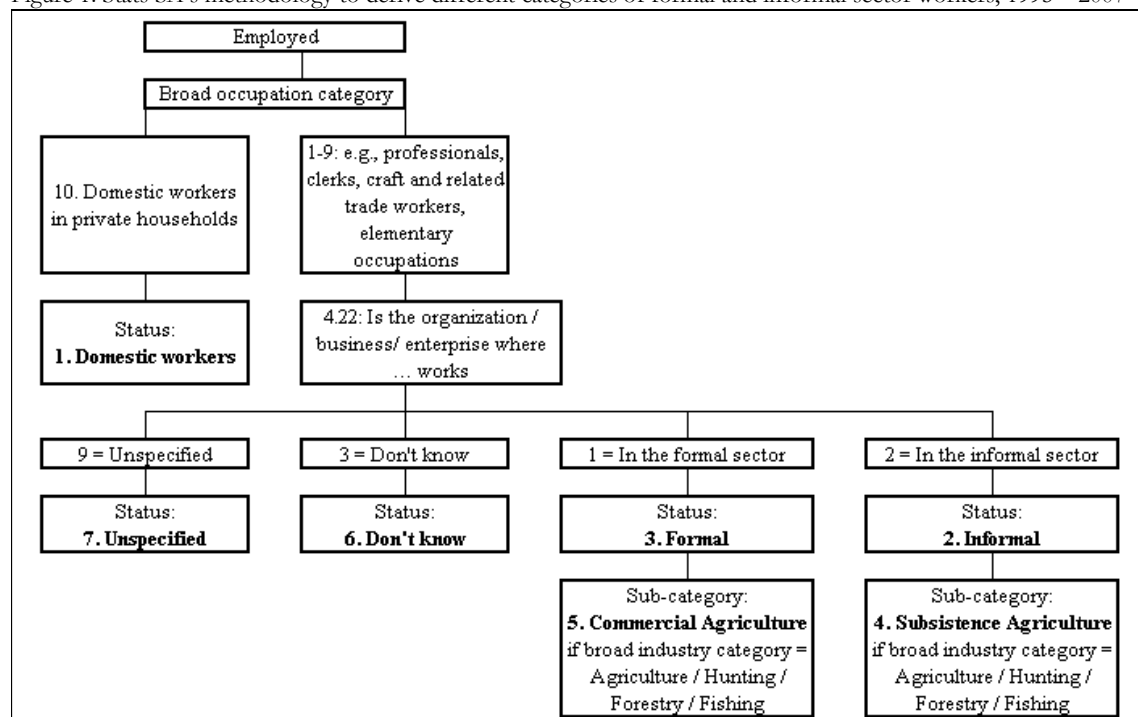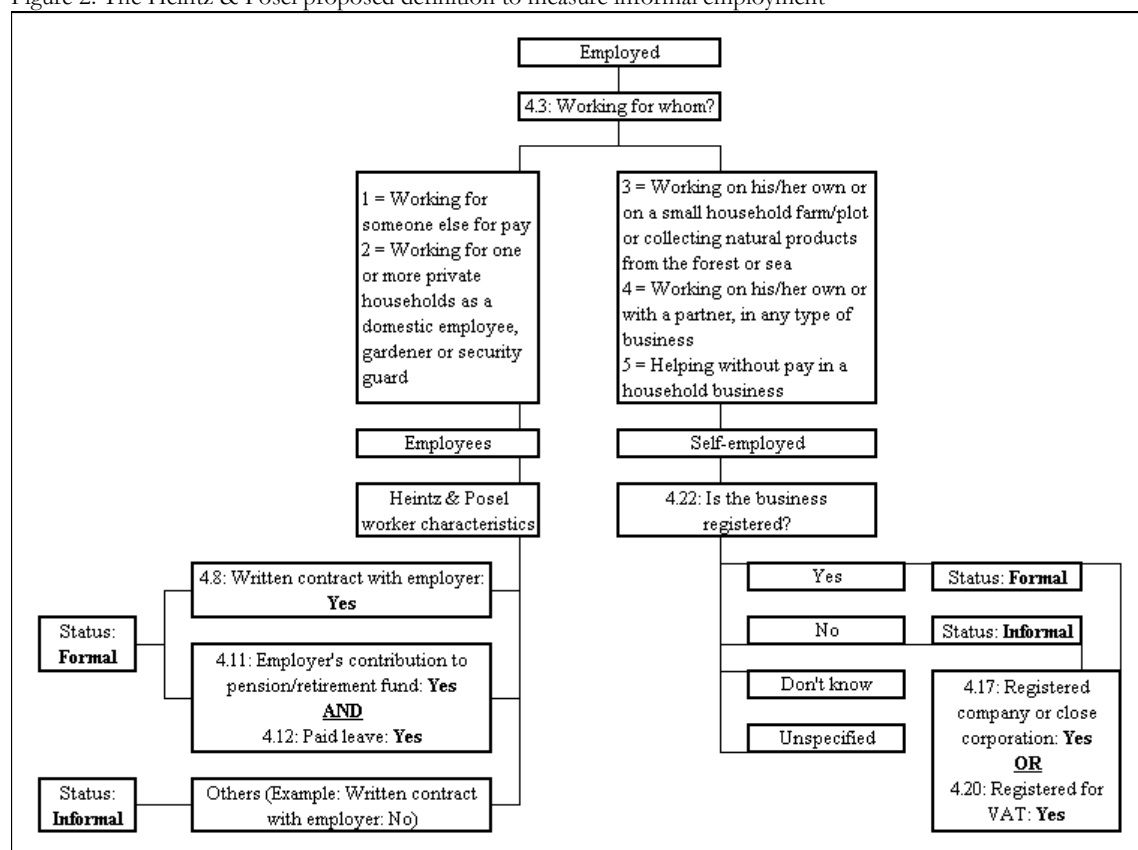


Note: The question number refers to the LFS 2007 September questionnaire.
Note: The option "I don't know" only became available since LFS 2000 March.

Heintz and Posel (2008: 32) suggest that those self-employed who self-identify as informal sector workers but also report that the enterprise is registered for VAT or as a company / close corporation be re-coded as formal sector workers. On the other hand, employees are defined as formal if they have a written employment contract or receive both paid leave and pension contributions, regardless of whether they work in a formal or informal enterprise, since these characteristics are entitlements of workers according to the Basic Conditions of Employment Act (BCEA) of 1997. This methodology, which is summarised in Figure 2, suggests that the enterprise approach should still be applied to distinguish informal self-employed, but that the characteristics of employment relationship with regard to social and legal protection be considered when defining informal employees. Alternatively, it could be said that there is an intersectoral margin between formal and informal firms in the case of self-employed, but an intersectoral margin of formal and informal workers operating through the labour market when looking at the employees (Maloney, 2006).

Figure 2: The Heintz & Posel proposed definition to measure informal employment



Note: The question number refers to the LFS 2007 September questionnaire.

Devey et al. (2006: 314-316, 321) argue that the distinction between formal and informal sectors seems to imply a clear line dividing the two, but that they are really integrally linked. Furthermore, while the enterprise approach exposes differences in characteristics of formal and informal workers, the categories are by no means mutually exclusive, since workers could display both formal and informal characteristics. This implies that there is an intra-worker margin where workers are partly formal and partly informal. Hence, they propose a formal-informal index, which is developed from a set of 13 indicators (Table 1): Five indicators are enterprise-based[7], seven are related to the employment relationship[8] and the remaining indicator is related to the characteristic of the workers[9]. All indicators carry equal weight in the index. The most formal and the most informal workers would achieve a score of thirteen and zero respectively for the index. However, this methodology could only be applied to the employees. In addition, a few problems in applying this methodology were pointed out by Essop and Yu (2008b: 10-11), such as that related to the choice of an appropriate cut-off score to distinguish informal workers; whether indicators should carry equal weight; and the problem of including the number of employers as one of the indicators. Therefore, Essop and Yu (2008b: 15-16) proposed a revised Devey et al. index (Table 2), with the main change being the replacement of the question on number of employers by one on the flexibility in work hours .

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[7] The indicators include the number of regular workers in enterprise, works for a registered company or close corporation, enterprise is registered to pay VAT, location of work, and the number of employers.
[8] The indicators include permanence of work, written contract, employer contributes to pension or retirement fund, paid leave, employer makes UIF deductions, employer makes medical aid or health insurance payments, and who pays wage.
[9] The indicator is membership of trade union.

Table 1: The indicators used to derive the Devey et al. formal-informal index for the employees

| Question number | Index = 1 | Index = 0 |
|---|---|---|
| 4.4: Number of employers | (1): One employer<br>(2): More than one employer | ??? |
| 4.6: Permanence of work | (1): Permanent | (2): Fixed period contract<br>(3): Temporary<br>(4): Casual<br>(5): Seasonal |
| 4.8: Written contract with employer | (1): Yes | (2): No |
| 4.10: Who pays wage | (1): Employer<br>(2): Labour broker<br>(3): Contractor or agency | (4): Other |
| 4.11: Employer contributes to pension or retirement fund | (1): Yes | (2): No |
| 4.12: Paid leave | (1): Yes | (2): No |
| 4.13: Trade union membership | (1): Yes | (2): No |
| 4.16 Number of regular workers in enterprise | (6): 50 or more | (1): 1<br>(2): 2 – 4<br>(3): 5 – 9<br>(4): 10 – 19<br>(5): 20 – 49 |
| 4.17: Working for a registered company or close corporation | (1): Yes | (2): No |
| 4.18: Employer makes UIF deductions | (1): Yes | (2): No |
| 4.19: Employer makes medical aid or health insurance payments | (1): Yes, for himself/herself only<br>(2): Yes, for himself/herself and his/her dependents<br>(3): Yes, but he/she is not using it | (4): No, because he/she is covered by someone else's medical aid<br>(5): No medical aid benefits |
| 4.20: Enterprise is registered to pay VAT | (1): Yes | (2): No |
| 4.23: Location of work | (3): Inside a formal business premises<br>(4): At a service outlet | (1): In the owner's home<br>(2): In someone else's home<br>(5): At a market<br>(6): On a footpath or street<br>(7): No fixed location<br>(8): Other |

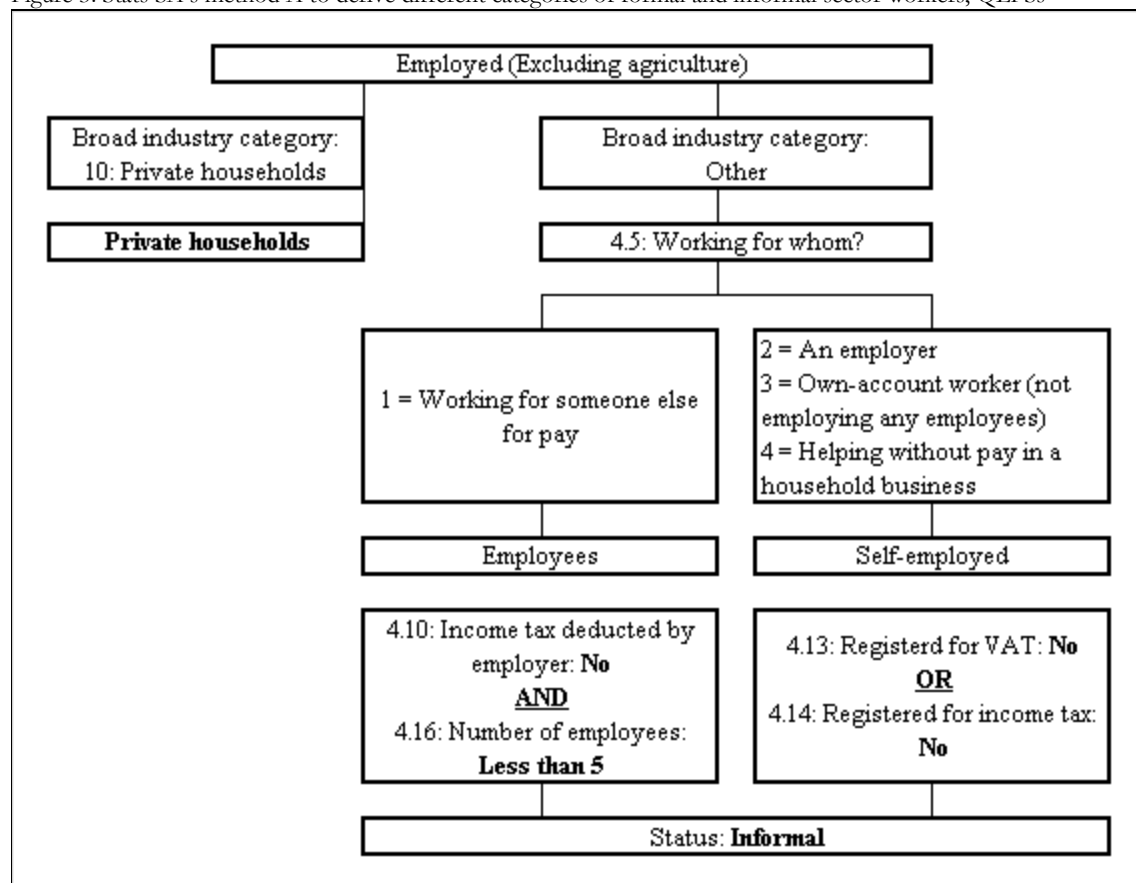Note: The question number refers to the LFS 2007 September questionnaire.

Table 2: The indicators used to derive the Essop & Yu formal-informal index for the employees

| Question number | Index = 1 | Index = 0 |
|---|---|---|
| 4.6: Permanence of work | (1): Permanent | (2): Fixed period contract<br>(3): Temporary<br>(4): Casual<br>(5): Seasonal<br>(6): Don't know<br>(9): Unspecified |
| 4.8: Written contract with employer | (1): Yes | (2): No<br>(3): Don't know<br>(9): Unspecified |
| 4.10: Who pays wage | (1): Employer<br>(2): Labour broker<br>(3): Contractor or agency | (4): Other<br>(5): Don't know<br>(9): Unspecified |
| 4.11: Employer contributes to pension or retirement fund | (1): Yes | (2): No<br>(3): Don't know<br>(9): Unspecified |
| 4.12: Paid leave | (1): Yes | (2): No<br>(3): Don't know<br>(9): Unspecified |
| 4.13: Trade union membership | (1): Yes | (2): No<br>(3): Don't know<br>(9): Unspecified |
| 4.16 Number of regular workers in enterprise | (6): 50 or more | (1): 1<br>(2): 2 – 4<br>(3): 5 – 9<br>(4): 10 – 19<br>(5): 20 – 49<br>(7): Don't know<br>(9): Unspecified |
| 4.17: Working for a registered company or close corporation | (1): Yes | (2): No<br>(3) Don't know<br>(9) Unspecified |
| 4.18: Employer makes UIF deductions | (1): Yes | (2): No<br>(3): Don't know<br>(9): Unspecified |
| 4.19: Employer makes medical aid or health insurance payments | (1): Yes, for himself/herself only<br>(2): Yes, for himself/herself and his/her dependents<br>(3): Yes, but he/she is not using it | (4): No, because he/she is covered by someone else's medical aid<br>(5): No medical aid benefits<br>(6): Don't know<br>(9): Unspecified |
| 4.20: Enterprise is registered to pay VAT | (1): Yes | (2): No<br>(3): Don't know<br>(9): Unspecified |
| 4.23: Location of work | (3): Inside a formal business premises<br>(4): At a service outlet | (1): In the owner's home<br>(2): In someone else's home<br>(5): At a market<br>(6): On a footpath or street<br>(7): No fixed location<br>(8): Other<br>(9): Unspecified |
| 4.26: Flexibility in work hours | (3): Work hours fixed by employer | (1): Can decide fully for himself<br>(2): Can decide, but within a limited range<br>(4): Don't know<br>(9): Unspecified |

Note: The question number refers to the LFS 2007 September questionnaire.

With the inception of the QLFS in 2008, Stats SA adopted two new methodologies to define informal employment (Stats SA, 2008: 17-18)[10]. In the first methodology (Method A), informal employment once again stands for those working in the informal sector. However, the direct, self-identification question, although still asked in the QLFS, is no longer considered when distinguishing informal sector workers. Instead, employees are defined as informal if income tax (PAYE/SITE) is not deducted from their salary/wage and the number of employees at the place of work is fewer than five, while the self-employed are defined as informal if they are not registered for either income tax or VAT[11]. Method A is summarized in Figure 3.

Figure 3: Stats SA's method A to derive different categories of formal and informal sector workers, QLFSs
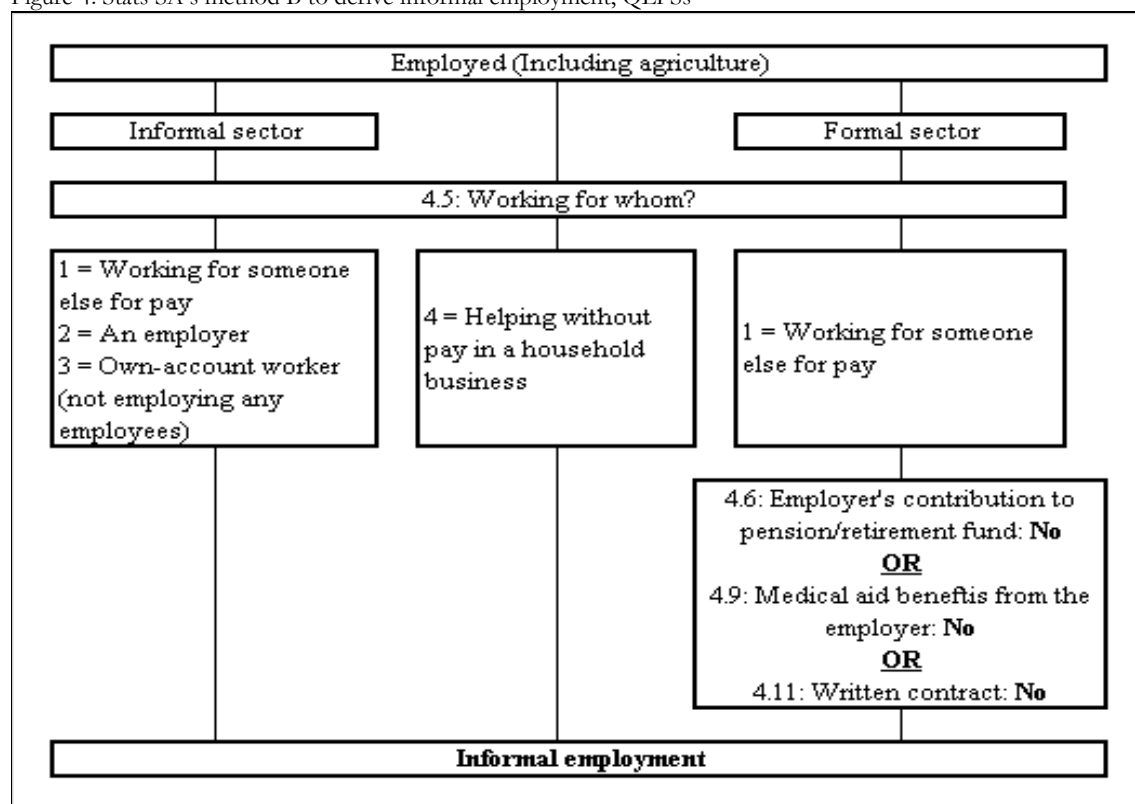


Note: The question number refers to the QLFS 2008 first quarter questionnaire.

In the second approach (Method B), as presented in Figure 4, informal employment comprises those working in the informal sector as well as those displaying informal characteristics working in the formal sector, i.e., the suggestions of both the 15th and 17th ICLS are considered. Informal sector workers as defined in method A are still considered as informal workers, while all the remaining people who are unpaid in household business but are not defined as informal sector workers are also defined as informal. Finally, employees classified as formal in method A are re-coded as informal if they are not entitled to medical aid or pension funds, or do not have a written contract with the employer.

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[10] Stats SA only release the informal employment figures using the first method in all the QLFS statistical reports.
[11] When the Stats SA 1995-2007 methodology is applied to the QLFS data, informal employment of the working-age population (15-65 years) is lower by between 100 000 and 200 000 in each survey, compared with the employment size derived by Stats SA method A.

Figure 4: Stats SA's method B to derive informal employment, QLFSs



Note: The question number refers to the QLFS 2008 first quarter questionnaire.

The former and current Stats SA approaches as well as the Heintz and Posel methodology discussed above clearly indicate that the definition of informal self-employed still stresses enterprise characteristics, despite the fact that the indicators used differ across methodologies. Similar indicators (i.e., company or close corporation registration, VAT registration, income tax registration) are also adopted in recent international studies to distinguish the informal self-employed (e.g., Anderson, 1998; ILO, 2004; Naik, 2009).

With regard to the employees, the employment relationship characteristics (as in the Heintz and Posel methodology) or a combination of enterprise and employment relationship characteristics (as in the two formal-informal index approaches) are considered when identifying the informal employees in the South African studies. A similar approach is adopted in international studies, with the frequently used employment relationship criteria to capture informal employees being permanence of work, written contract, employer's contributions to pension or retirement fund, paid leave and employer's medical aid payments (e.g., Portes et al., 1986; Anderson, 1998; ILO, 2004; Gasparini & Tornarolli, 2007; ECA, 2008; Henley et al., 2009; Naik, 2009)[12]. In contrast, the most commonly used enterprise characteristics are enterprise registration status, work location, and firm size (e.g., Bekkers & Stoffers, 1995; Bernabè, 2002; Gasparini & Tornarolli, 2007; ECA, 2008; Henley et el., 2009; Naik, 2009). With regard to the firm size criterion, a measure of fewer than five regular workers or employees is defined as 'small' before the employees are classified as informal in all the studies, except in Bekkers & Stoffers (1995) (fewer than 10 employees), and Devey et al. (2006) as well Essop and Yu (2008b) (fewer than 50 regular workers).

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[12] Payer of wages and work hours flexibility, the indicators used in the Devey et al. and Essop and Yu approaches respectively, are not considered as indicators to distinguish informal employees in other recent local and international studies. This implies that not all thirteen indicators are necessary in these formal/informal index approaches.

The enterprise and employment relationship indicators used in the approaches discussed so far are, in general, the popular economic criteria adopted to define informal employment in less developed countries (Gërxhani, 2003: 272-274). However, some recent international studies propose that the third type of characteristics should be considered when defining informal employment, namely worker characteristics. First, the study by Gasparini and Tornarolli (2007: 2-4) on the Latin American and Caribbean countries argues that informal workers are engaged in unskilled, low-productivity jobs in small-scale and often family-based activities with low income. Hence, under the so-called productive approach, the self-employed are defined as informal if they are unskilled workers, which stands for all individuals without a tertiary education qualification. Moreover, employees are distinguished as informal if they are salaried workers (i.e., earning non-zero income) in a small private firm with fewer than five employees, or if they are zero-income workers[13].

In contrast, the study by Henley et al. (2008: 996) on the Brazilian economy adopts the formal sector activity approach[14] to define employees as formal workers if they are employed in an establishment of at least five employees, while the self-employed are classified as formal if their occupation are 'creative and technical' or 'administrative' (so as to capture professional activities[15]). The rest are considered as informal workers. Thus, this approach is similar to the productive definition of the Gasparini and Tornarolli approach, as the enterprise characteristic (firm size) is considered when defining informal employees, while worker characteristics are the criteria used in the case of self-employed.

The worker characteristics adopted in the two approaches discussed above – earnings, education, and occupation – are also the criteria taken into consideration to identify informal employees by the United Nations Region Employment for Latin America (PREALC) (Tokman, 1982), and Anderson (1998) in the study on the Mongolian economy. Lastly, the public/private sector work status of the employees is another worker characteristic considered to define informal workers in the study by ECA (2008) on the Namibian and Tanzanian economies, as all public sector workers are excluded from informal employment.

## 3.     INFORMALITY IN SOUTH AFRICA UNDER DIFFERENT APPROACHES

To assess the possible size of informal employment in South Africa, with particular focus on what happened in the QLFSs, the following five measures will be investigated: (1) Stats SA method A, (2) Stats SA method B, (3) Heintz and Posel approach, (4) Gasparini and Tornarolli productive approach, and (5) Henley et al. formal sector activity approach. The last three approaches require revisions before they could be adopted in the QLFS due to the comparability issues between the LFSs and QLFSs (Yu, 2009). First, since the question on company/close corporation registration, one of the indicators used in the Heintz & Posel methodology, is no longer asked in the QLFSs, while the information on the respondents' answer on the direct, self-identification question is no longer available from QLFS 2009Q3[16], it was rather decided to revise the Heintz and Posel approach as follows (See Figure 5): Stats SA method A was adopted to

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[13] Gasparini and Tornarolli (2007: 4) also adopts the second approach – the legalistic or social protection approach – to distinguish informal workers as those without the right to a pension linked to employment when retired. This approach clearly takes the employment relationship characteristic into consideration.

[14] Henley et al. (2008: 996) also adopts two other approaches to define informal employment, namely the contract status approach and social security status approach. It is obvious that these two approaches focus on the employment relationship to distinguish informal workers.

[15] Hart (1970, 1973), in his study on informal activities in Ghana, adopts this approach to define informal workers as the sum of the self-employed, family workers and domestic servants. This professional status criterion was not popular for a while before being used again in the early 1990s (e.g., Charmes, 1990).

[16] Although this question is asked in all QLFSs, the results are not included since QLFS 2009Q3 when Stats SA released the data. Stats SA did not explain the reason for this exclusion in the metadata document of the data.

capture the self-employed in the informal sector, while the same three indicators as discussed in Section 2 were used to distinguish the informal employees.

Figure 5: The revised Heintz & Posel proposed definition to measure informal employment
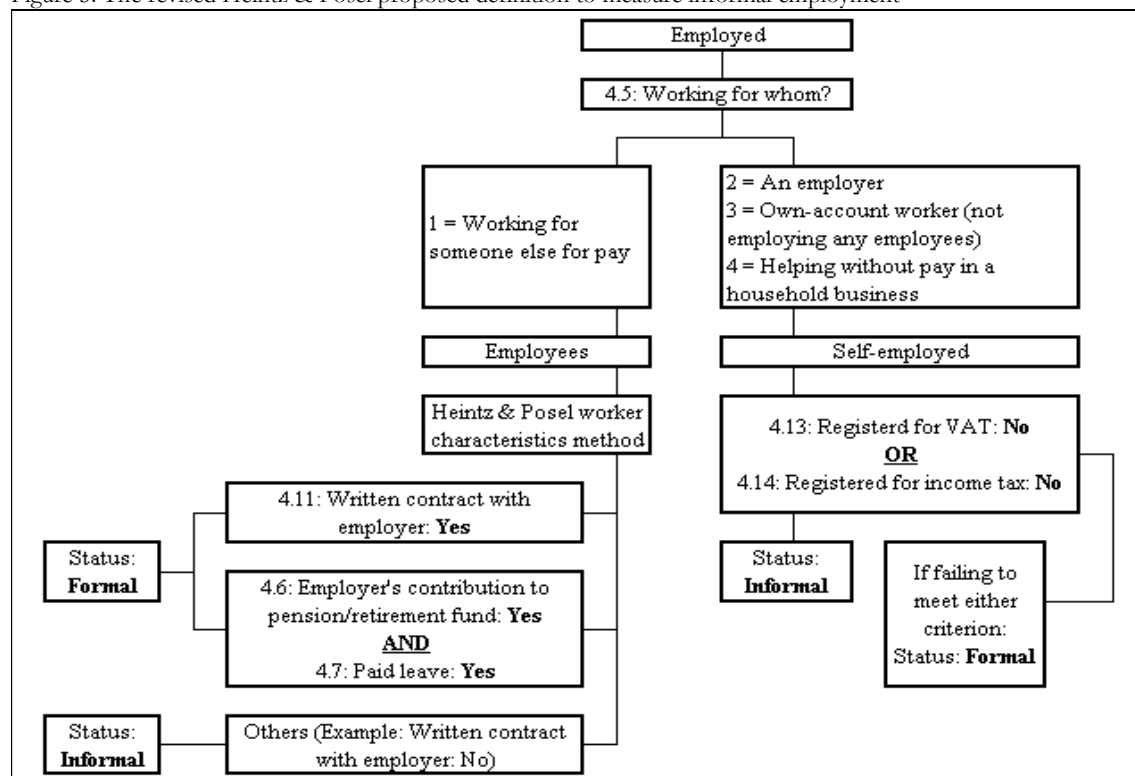


Note: The question number refers to the QLFS 2008 first quarter questionnaire.

Secondly, the main concern of the productive definition recommended by Gasparini and Tornarolli is that the question on earnings from the main job is not asked since the introduction of the QLFS. It is also difficult to adopt Henley et al.'s activity approach unchanged to the South African data, since occupational classifications between Brazil and South Africa differ. Hence, the following revised Gasparini & Tornarolli productive approach will be adopted: The self-employed are still defined as informal workers if they do not have a bachelor degree, while employees are classified as informal workers if they work in a firm with fewer than five employees. Finally, in the Henley et al. activity approach, the same methodology is adopted to distinguish the informal employees, i.e., employed in an establishment of at least five employees[17], while informal self-employed are defined as those with semi-skilled or unskilled occupations.

Apart from analyzing the informal employment numbers and trends from these five approaches, the correspondence between these measures will be looked at, i.e., whether the different methodologies capture the same groups of informal workers. Finally, as seven indicators used in the Devey et al. as well as Essop and Yu formal-informal index approaches are still asked in the QLFS, a principal components analysis (PCA) approach will be adopted to derive a mini Devey et al. formal/informal index (See Table 3)[18]. This index is then used to divide the employees into quintiles, before the informal employment derived from the five approaches as mentioned above is analyzed by quintile, so as to explore in greater detail if there are underlying differences between these definitions.

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[17] This implies that both the revised Gasparini and Tornarolli productive approach and the revised Henley et al. approach distinguish informal employees in the same way.

[18] It is decided to name this index as 'mini Devey et al. index' partly because only seven but not 13 indicators are involved in its derivation, but also to distinguish this index clearly from the revised Devey et al. index derived by Essop and Yu (2008b).

Table 3: The indicators used to derive the mini Devey et al. formal-informal sector index for the employees

| Question number | Index = 1 | Index = 0 |
|---|---|---|
| 4.6: Employer contributes to pension or retirement fund | (1): Yes | (2): No<br>(3): Don't know |
| 4.7: Paid leave | (1): Yes | (2): No<br>(3): Don't know |
| 4.8: Employer makes UIF deductions | (1): Yes | (2): No<br>(3): Don't know |
| 4.9: Medical aid benefits | (1): Yes | (2): No<br>(3): Don't know |
| 4.11: Written contract with employer | (1): A written contract | (2): A verbal agreement |
| 4.12: Permanence of work | (2): Permanent nature | (1): Limited duration<br>(3): Unspecified duration |
| 4.16: Number of employees | (7): 50 or more | (1): 0<br>(2): 1<br>(3): 2-4<br>(4): 5-9<br>(5): 10-19<br>(6): 20-49<br>(8): Don't know |

Note: The question number refers to the QLFS 2008 first quarter questionnaire.

Tables 4 and 5 summarise the indicators used to define informal employment in each approach.

Table 4: Indicators used to define informal employment in each approach, LFSs

| | Stats SA (95-07) | Heintz & Posel | Devey *et al.* | Essop & Yu | Gasparini & Tornarolli | Henley et al. |
|---|---|---|---|---|---|---|
| **Self-employed** | | | | | | |
| Formal/Informal sector direct question | ✓ | ✓ | | | | |
| Company/CC registration | | ✓ | | | | |
| VAT registration | | ✓ | | | | |
| Income tax registration | | | | | | |
| Educational attainment | | | | | ✓ | |
| Occupation | | | | | | ✓ |
| *# of indicators used* | *1* | *3* | *N/A* | *N/A* | *1* | *1* |
| **Employees** | | | | | | |
| Formal/Informal sector direct question | ✓ | | | | | |
| Pension fund | | ✓ | ✓ | ✓ | | |
| Paid leave | | ✓ | ✓ | ✓ | | |
| UIF | | | ✓ | ✓ | | |
| Medical aid | | | ✓ | ✓ | | |
| Income tax | | | | | | |
| Written contract | | ✓ | ✓ | ✓ | | |
| Job permanence | | | ✓ | ✓ | | |
| Firm size | | | ✓ | ✓ | ✓ | ✓ |
| Payer of wages | | | ✓ | ✓ | | |
| Trade union membership | | | ✓ | ✓ | | |
| Location of work | | | ✓ | ✓ | | |
| Number of employers | | | ✓ | | | |
| Work hours flexibility | | | | ✓ | | |
| Company/CC registration | | | ✓ | ✓ | | |
| VAT registration | | | ✓ | ✓ | | |
| Income tax registration | | | | | | |
| Earnings from main job | | | | | ✓ | |
| *# of indicators used* | *1* | *3* | *13* | *13* | *2* | *1* |

Table 5: Indicators used to define informal employment in each approach, QLFSs

| | Stats SA method A | Stats SA method B | Revised Heintz & Posel | Revised Gasparini & Tornarolli | Revised Henley *et al.* | Mini Devey *et al.* |
|---|---|---|---|---|---|---|
| **Self-employed** | | | | | | |
| Company/CC registration | | | | | | |
| VAT registration | ✓ | ✓ | ✓ | | | |
| Income tax registration | ✓ | ✓ | ✓ | | | |
| Educational attainment | | | | ✓ | | |
| Occupation | | | | | ✓ | |
| *# of indicators used* | *2* | *2* | *2* | *1* | *1* | *N/A* |
| **Employees** | | | | | | |
| Pension fund | | ✓ | ✓ | | | ✓ |
| Paid leave | | | ✓ | | | ✓ |
| UIF | | | | | | ✓ |
| Medical aid | | ✓ | | | | ✓ |
| Written contract | | ✓ | ✓ | | | ✓ |
| Job permanence | | | | | | ✓ |
| Firm size | ✓ | ✓ | | ✓ | ✓ | ✓ |
| Income tax registration | ✓ | ✓ | | | | |
| *# of indicators used* | *2* | *5* | *3* | *1* | *1* | *7* |

First, Table 6 presents the number as well as the proportions of self-employed classified as informal under each measure. The number of informal self-employed and the rates of informality fluctuates at the 1.3-1.5 million and 68%-72% ranges respectively in all approaches, except the revised Gasparini and Tornarolli approach, which results in a higher rate of informality (approximately 90% during the period under study). Next, Table 7 shows the same statistics on the employees. Stats SA method B results in the highest estimate of the rate of informality at about two-thirds (more than 6 million) of all employees during the period under investigation. This is followed by the revised Heintz and Posel approach, which estimates that about 15% of employees (between 1.2 and 1.5 million during the period) are informal. The rate of informality is the lowest in Stats SA method A.

Table 6: Informal employment in the self-employed (weighted, 1000s), QLFS 2008Q1 – QLFS 2009Q4

| | Stats SA method A | Stats SA method B | Revised Heintz & Posel | Revised Gasparini & Tornarolli | Revised Henley *et el.* |
|---|---|---|---|---|---|
| | Number of informal self-employed | | | | |
| 2008 Q1 | 1443 | 1479 | 1443 | 1861 | 1426 |
| 2008 Q2 | 1512 | 1547 | 1512 | 1914 | 1445 |
| 2008 Q3 | 1406 | 1448 | 1406 | 1852 | 1382 |
| 2008 Q4 | 1500 | 1534 | 1500 | 1921 | 1452 |
| 2009 Q1 | 1455 | 1497 | 1455 | 1884 | 1424 |
| 2009 Q2 | 1441 | 1477 | 1441 | 1844 | 1373 |
| 2009 Q3 | 1296 | 1335 | 1296 | 1666 | 1200 |
| 2009 Q4 | 1402 | 1434 | 1402 | 1774 | 1304 |
| | As % of all self-employed | | | | |
| 2008 Q1 | 71.2% | 72.9% | 71.2% | 91.8% | 70.3% |
| 2008 Q2 | 72.9% | 74.6% | 72.9% | 92.3% | 69.7% |
| 2008 Q3 | 69.1% | 71.2% | 69.1% | 91.0% | 67.9% |
| 2008 Q4 | 71.2% | 72.8% | 71.2% | 91.1% | 68.9% |
| 2009 Q1 | 70.1% | 72.1% | 70.1% | 90.7% | 68.6% |
| 2009 Q2 | 72.1% | 73.9% | 72.1% | 92.2% | 68.7% |
| 2009 Q3 | 71.0% | 73.1% | 71.0% | 91.3% | 65.7% |
| 2009 Q4 | 72.7% | 74.4% | 72.7% | 92.0% | 67.6% |

Table 7: Informal employment in the employees (weighted, 1000s), QLFS 2008Q1 – QLFS 2009Q4

| | Stats SA method A | Stats SA method B | Revised Heintz & Posel | Revised Gasparini & Tornarolli | Revised Henley *et el.* |
|---|---|---|---|---|---|
| | Number of informal self-employed | | | | |
| 2008 Q1 | 852 | 6633 | 1646 | 1229 | 1229 |
| 2008 Q2 | 786 | 6647 | 1581 | 1167 | 1167 |
| 2008 Q3 | 707 | 6479 | 1442 | 1082 | 1082 |
| 2008 Q4 | 709 | 6454 | 1423 | 1008 | 1008 |
| 2009 Q1 | 675 | 6264 | 1286 | 979 | 979 |
| 2009 Q2 | 664 | 6218 | 1238 | 975 | 975 |
| 2009 Q3 | 680 | 6068 | 1243 | 997 | 997 |
| 2009 Q4 | 660 | 6084 | 1250 | 935 | 935 |
| | As % of all self-employed | | | | |
| 2008 Q1 | 8.8% | 68.8% | 17.1% | 12.8% | 12.8% |
| 2008 Q2 | 8.1% | 68.5% | 16.3% | 12.0% | 12.0% |
| 2008 Q3 | 7.4% | 67.5% | 15.0% | 11.3% | 11.3% |
| 2008 Q4 | 7.3% | 66.6% | 14.7% | 10.4% | 10.4% |
| 2009 Q1 | 7.1% | 65.7% | 13.5% | 10.3% | 10.3% |
| 2009 Q2 | 7.0% | 65.6% | 13.1% | 10.3% | 10.3% |
| 2009 Q3 | 7.4% | 65.6% | 13.4% | 10.8% | 10.8% |
| 2009 Q4 | 7.1% | 65.4% | 13.4% | 10.0% | 10.0% |

Figure 6 analyzes the QLFS 2009Q4 informal employment in more detail by showing the percentage shares of self-employed and employees respectively, and the results suggest that a majority of the informal workers are self-employed in all approaches, except in Stats SA method B, in which slightly more than 80% of the informal workers are employees. This contradicts the general findings in the South African studies (Devey et al., 2003, Essop and Yu, 2008a) that the self-employed comprise a bigger share of informal employment.

Figure 6: Proportions of self-employed and employees in informal employment, QLFS 2009Q4
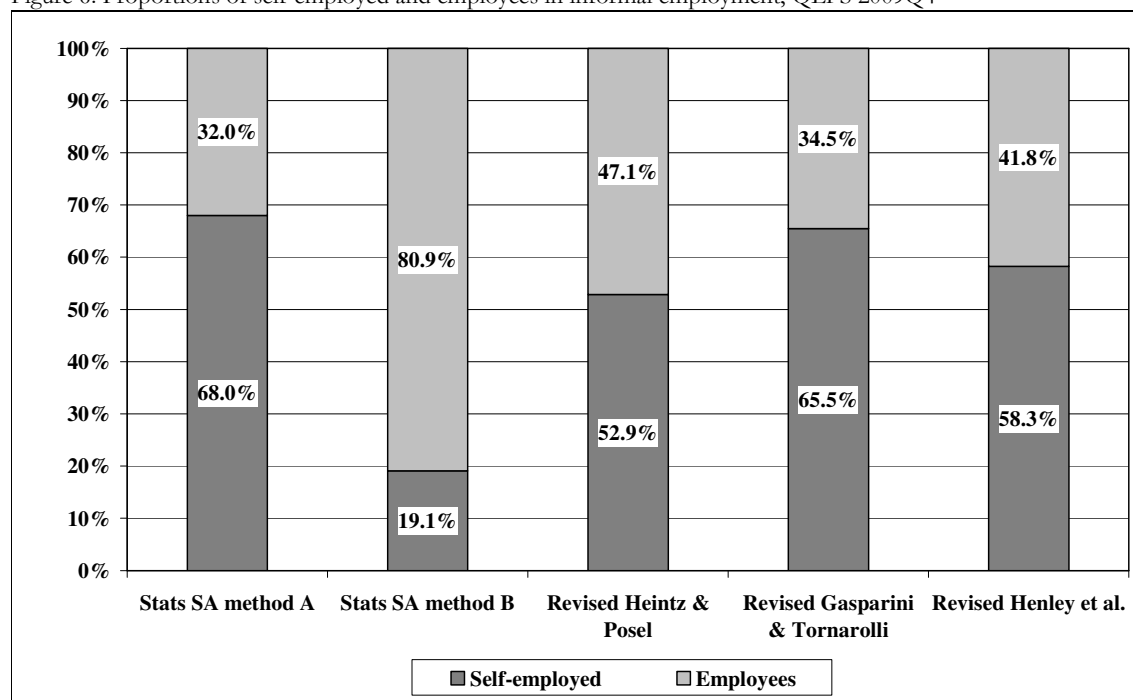
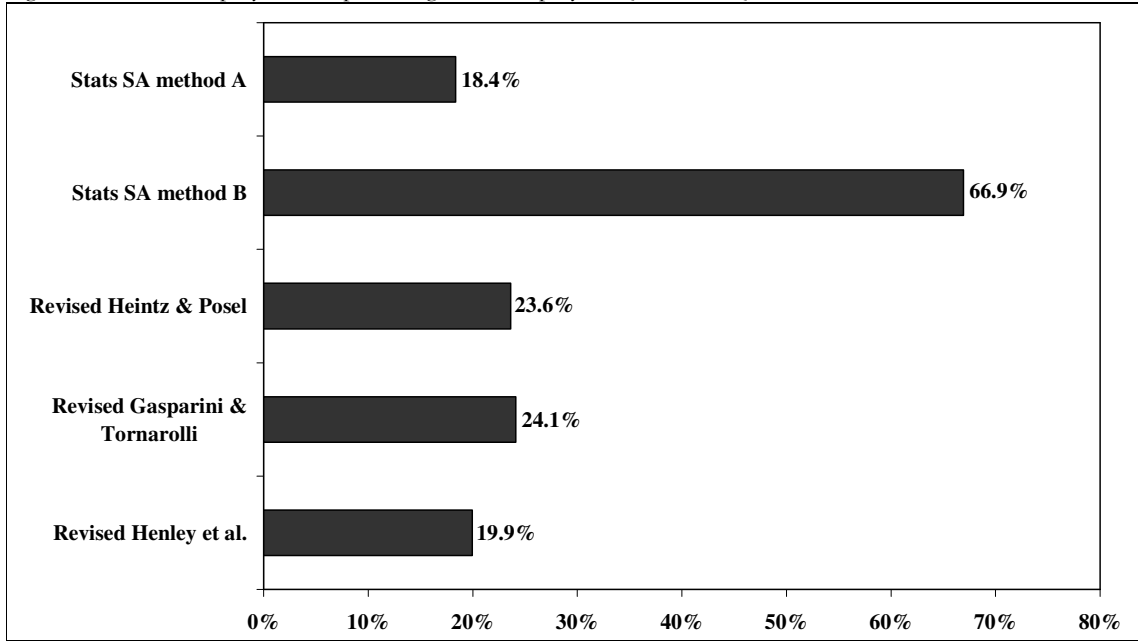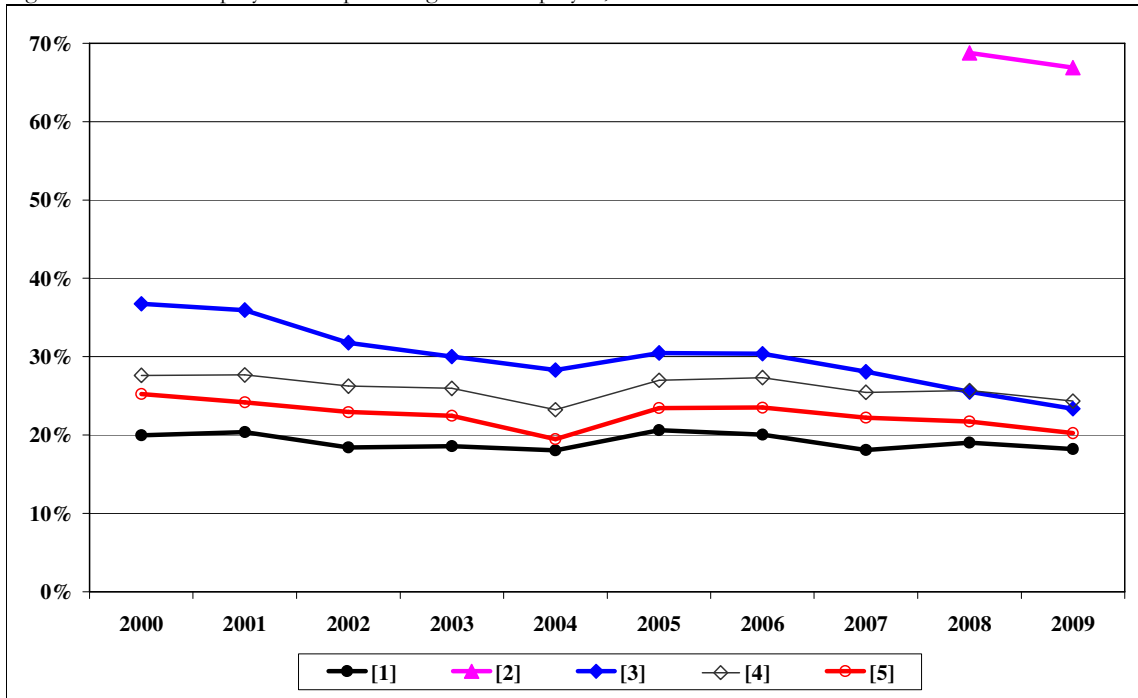Figure 7: Informal employment as percentage of all employed, QLFS 2009Q4



Figure 8: Informal employment as percentage of all employed, 2000 – 2009



[1]: Stats SA 1995-2007 methodology in 2000-2007, and method A in 2008-2009
[2]: Stats SA method B in 2008-2009
[3]: Heintz and Posel approach in 2000-2007, and revised Heintz and Posel approach in 2008-2009
[4]: Gasparini and Tornarolli approach in 2000-2007, and revised Gasparini and Tornarolli approach in 2008-2009
[5]: Henley et al. approach in 2000-2007, and revised Henley et al. approach in 2008-2009

Informal employment as percentage of all employed in QLFS 2009Q4 is presented in Figure 7. It can be seen that this proportion is the lowest if Stats SA method A is adopted (18.4%), followed by the revised Henley et al. approach (19.4%). The revised Heintz and Posel as well as the revised Gasparini and Tornarolli approaches result in somewhat more, approximately a quarter, of employed being defined as informal. This proportion is the highest for the Stats SA method B,

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which implies that two out of three employed are informal workers (66.9%). If the latter approach is adopted, would South Africa still be classified as an international outlier with high unemployment but low informal employment?[19] Figure 8 provides more detail by presenting what has been happening since 2000. The enterprise-based approaches as adopted in Stats SA's 1995-2007 methodology as well as method A result in the lowest rates of informality in all years.

Finally, as mentioned in Section 1, unemployment could be hidden in the informal economy to some extent, and hence Figure 9 shows the percentage of the labour force who are classified as either strictly unemployed or informal workers in QLFS 2009Q4. As expected, this proportion is the highest if Stats SA method B is adopted, since a very high number of employees are identified as informal. This suggests that the problem lies either in the extremely slow employment creation in the formal economy, or that this methodology might be too broad a measure to capture informal employees.

Figure 9: Percentage of labour force defined as unemployed or informal workers, QLFS 2009Q4
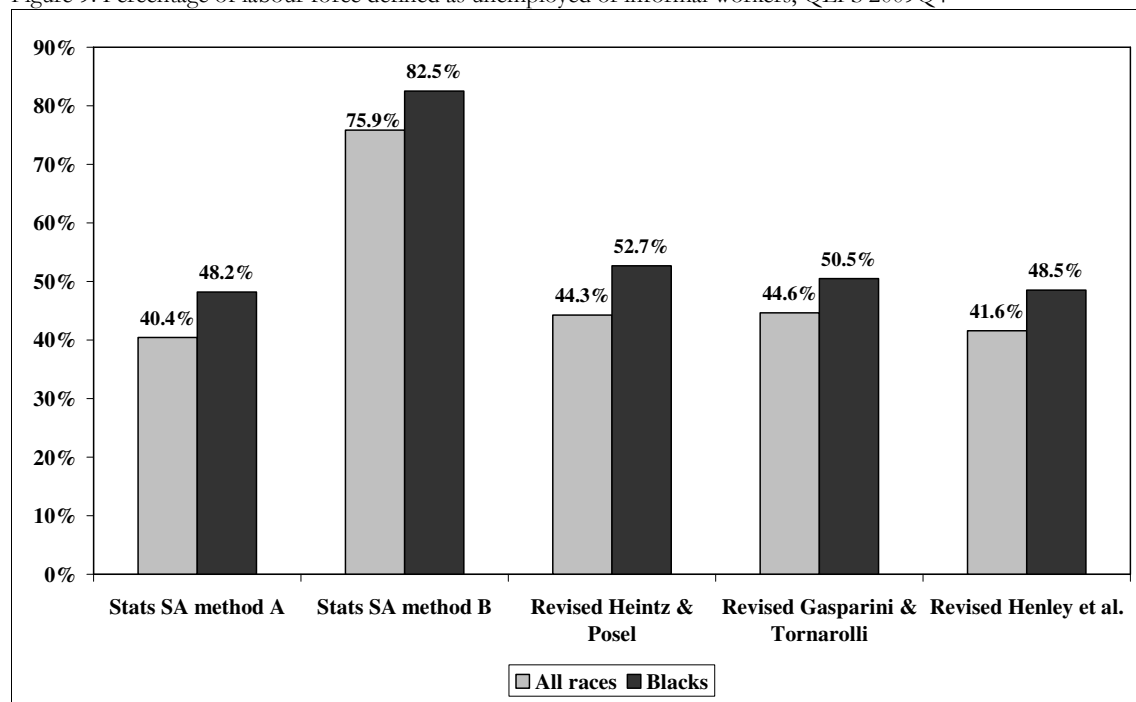


Although the descriptive statistics discussed above show that the rates of informality are similar in some approaches, this does not imply that the same workers are classified as informal by all approaches. For this reason, Table 8 presents three matrices, which shows the proportion of informal workers as defined by one approach that are also defined as informal in another approach, in the case of self-employed, employees and all employed respectively, in QLFS 2009Q4. For example, the value 0.84 in the second row of the first matrix means that 84% of the informal self-employed as classified under the Stats SA method B are also defined as informal self-employed in the revised Henley et al. approach.

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[19] The United Nations, in collaboration with other international institutions, will conduct a study on the measurements of the informal sector and informal employment by country in late 2010, applying a consistent methodology across all countries. Only when these data are released could one make a more proper judgment on whether South Africa is indeed an international outlier.

Table 8: Proportion of informal workers defined by one approach classified as informal in another approach, QLFS 2009Q4

| Informal self-employed | | [1] | [2] | [3] | [4] | [5] |
|---|---|---|---|---|---|---|
| | [1] | 1.00 | 1.00 | 1.00 | 0.97 | 0.83 |
| | [2] | 0.97 | 1.00 | 0.97 | 0.97 | 0.84 |
| | [3] | 1.00 | 1.00 | 1.00 | 0.97 | 0.83 |
| | [4] | 0.77 | 0.78 | 0.77 | 1.00 | 0.72 |
| | [5] | 0.90 | 0.92 | 0.90 | 0.98 | 1.00 |
| Informal employees | | [1] | [2] | [3] | [4] | [5] |
| | [1] | 1.00 | 1.00 | 0.66 | 1.00 | 1.00 |
| | [2] | 0.11 | 1.00 | 0.21 | 0.14 | 0.14 |
| | [3] | 0.35 | 1.00 | 1.00 | 0.36 | 0.36 |
| | [4] | 0.71 | 0.90 | 0.48 | 1.00 | 1.00 |
| | [5] | 0.71 | 0.90 | 0.48 | 1.00 | 1.00 |
| Informal workers (self-employed + employees) | | [1] | [2] | [3] | [4] | [5] |
| | [1] | 1.00 | 1.00 | 0.89 | 0.98 | 0.89 |
| | [2] | 0.27 | 1.00 | 0.35 | 0.30 | 0.27 |
| | [3] | 0.69 | 1.00 | 1.00 | 0.68 | 0.61 |
| | [4] | 0.75 | 0.82 | 0.67 | 1.00 | 0.82 |
| | [5] | 0.82 | 0.91 | 0.72 | 0.99 | 1.00 |

[1]: Stats SA method A
[2]: Stats SA method B
[3]: Revised Heintz and Posel approach
[4]: Revised Gasparini and Tornarolli approach
[5]: Revised Henley et al. approach

The first matrix of the table shows that all these approaches capture a very similar group of informal self-employed, except for the revised Gasparini and Tornarolli methodology, as only about three out of four informal self-employed as defined by this approach are also classified as informal in each of the other four methods. On the other hand, the second matrix clearly shows that a very low proportion of informal employees as defined by the Stats SA method B are also classified as informal in the other approaches. Besides, all employees classified as informal in the revised Heintz and Posel approach are also defined as informal workers in Stats SA method B, but this proportion is only about 0.35 when compared with the other three approaches. This suggests that Stats SA method B and the revised Heintz and Posel methodology might have captured different groups of informal employees.

Figures 10 and 11 illustrate the coincidence of the various definitions of informal employment further. First, Figure 10 shows that 94.7% of the self-employed are defined as informal in at least one of the five measures under study in QLFS 2009Q4. Looking at these informal self-employed in greater detail, slightly below two-thirds of them are defined as informal under all five approaches, while over 20% are distinguished as informal by between two and four approaches. However, about 15% are defined as informal only under the revised Gasparini and Tornarolli approach. The results again imply that this approach might have captured a different group of informal self-employed. With regard to employees, 67.7% of them are defined as informal in at least one measure under study, as shown in Figure 11. However, only 6.9% of these informal employees are so defined in all five approaches. In addition, about two-thirds are distinguished as informal only under the Stats SA 2008b methodology.

Figure 10: Coincidence of various definitions of informal self-employment, QLFS 2009Q4
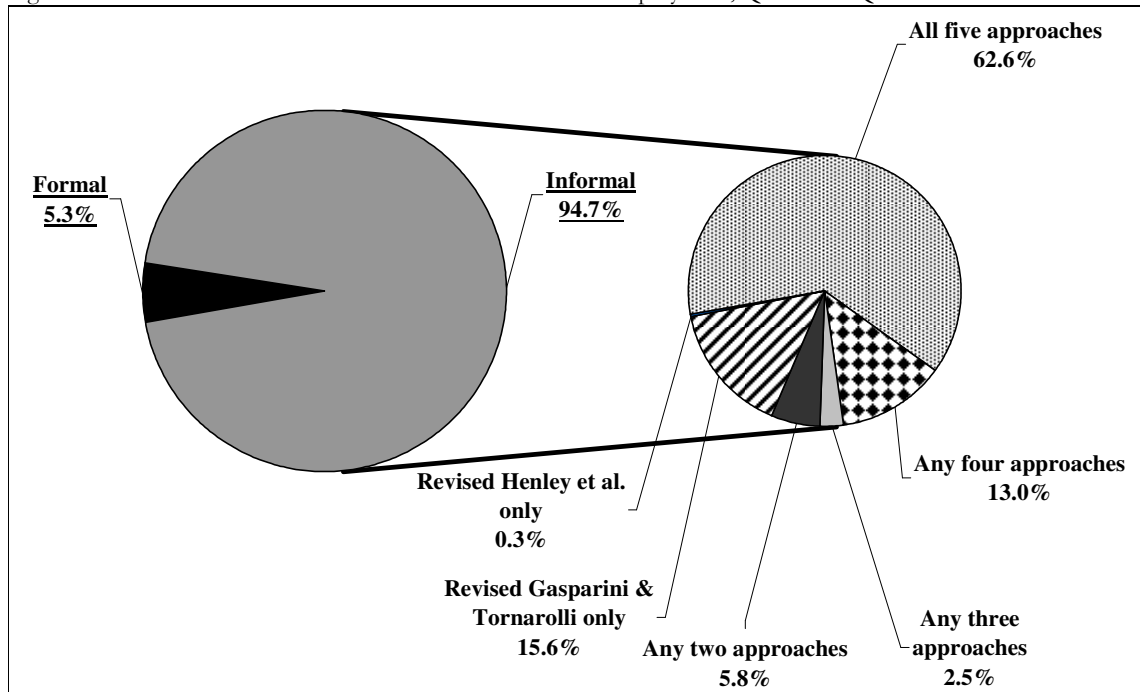


**All five approaches**
**62.6%**

**Formal**
**5.3%**

**Informal**
**94.7%**

**Revised Henley et al.**
**only**
**0.3%**

**Any four approaches**
**13.0%**

**Revised Gasparini &**
**Tornarolli only**
**15.6%**

**Any two approaches**
**5.8%**

**Any three**
**approaches**
**2.5%**

Figure 11: Coincidence of various definitions of informal employees, QLFS 2009Q4



**Any two approaches**
**16.5%**

**Stats SA method B**
**only**
**67.1%**

**Formal**
**32.3%**

**Informal**
**67.7%**

**Any three**
**approaches**
**3.8%**

**Revised Henley**
**et al. only**
**1.8%**

**Any four approaches**
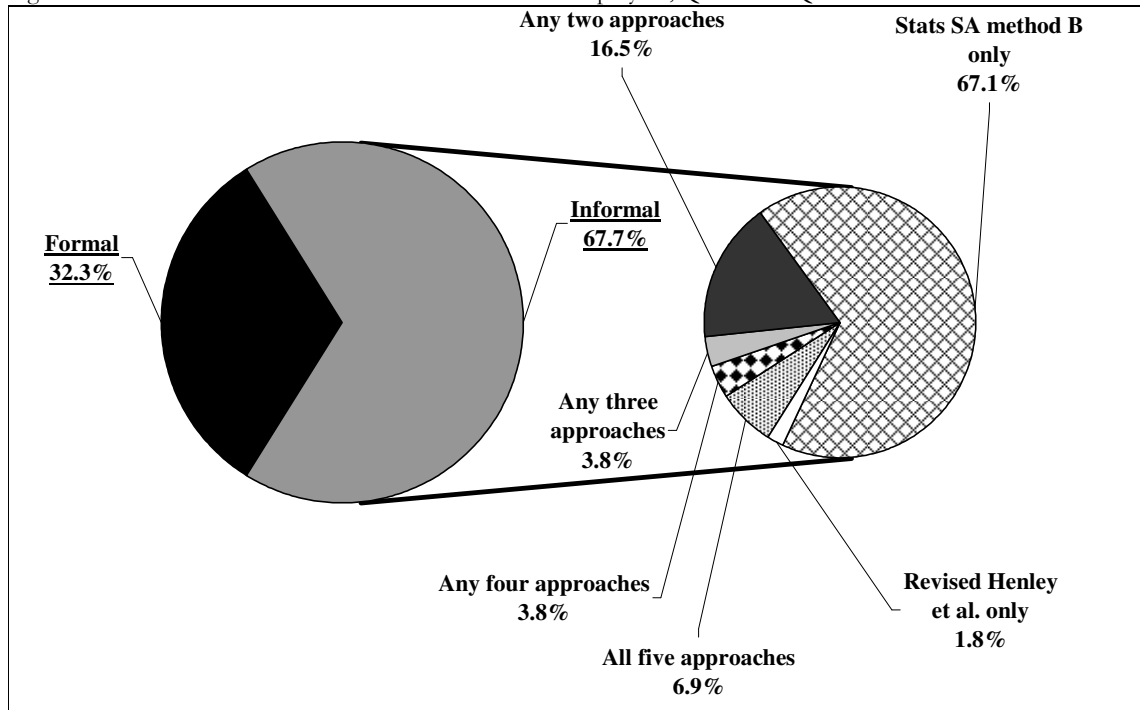**3.8%**

**All five approaches**
**6.9%**

Table 9 aims to confirm the findings discussed above by looking at the racial, gender and educational attainment characteristics of the informal workers under each approach, and the results once again suggest that the self-employed captured as informal by the revised Gasparini and Tornarolli methodology are different, as the black and female shares are 10 and 5 percentage points lower respectively, and these informal workers are more educated on average by 0.5 year. With regard to the employees, although a very high proportion of them are classified as informal only in the Stats SA method B, in general, these informal workers have similar characteristics as

defined as informal employees by the revised Gasparini and Tornarolli as well as the revised Henley et al. approaches. However, the black share is clearly higher, and the mean years of educational attainment are lower for informal employees defined by either the Stats SA method A or the revised Heintz and Posel approach.

Table 9: Descriptive analysis by informal employment definition – gender, race and education, QLFS 2009Q4

|  |  | Black share | Female share | Mean years of education |
|---|---|---|---|---|
| Self-employed | Stats SA method A | 86.9% | 48.3% | 8.76 |
|  | Stats SA method B | 86.0% | 48.9% | 8.83 |
|  | Revised Heintz & Posel | 86.9% | 48.3% | 8.76 |
|  | Revised Gasparini & Tornarolli | 75.3% | 43.5% | 9.30 |
|  | Revised Henley et al. | 85.6% | 49.3% | 8.75 |
| Employees | Stats SA method A | 81.1% | 38.4% | 9.48 |
|  | Stats SA method B | 71.2% | 40.8% | 10.31 |
|  | Revised Heintz & Posel | 82.9% | 30.3% | 9.27 |
|  | Revised Gasparini & Tornarolli | 71.9% | 42.0% | 10.01 |
|  | Revised Henley et al. | 71.9% | 42.0% | 10.01 |

As mentioned in Section 2, a lot of workers could display both formal and informal characteristics, but all the approaches discussed so far seem to suggest a clear dividing line between formal and informal workers, except the two formal-informal index approaches. Therefore, to conclude this section, seven of the 13 indicators that are can still be contained from the questions in the QLFS[20] are used to derive the mini Devey et al. index using the principal components analysis (PCA), with each indicator carrying different weight[21]. All employees are then divided into five equal groups (i.e., quintiles) of this index, before the distribution of informal employees as defined by each of the five approaches is investigated.

Table 10: Proportion of employees defined as informal by quintile of the mini Devey et al. index, QLFS 2009Q4

|  | Stats SA method A | Stats SA method B | Revised Heintz & Posel | Revised Gasparini & Tornarolli | Revised Henley et el. |
|---|---|---|---|---|---|
|  | Number of informal self-employed | | | | |
| Quintile 1 | 77.7% | 32.2% | 95.2% | 58.0% | 58.0% |
| Quintile 2 | 14.4% | 26.0% | 4.7% | 15.0% | 15.0% |
| Quintile 3 | 7.5% | 31.9% | 0.0% | 16.9% | 16.9% |
| Quintile 4 | 0.5% | 9.9% | 0.0% | 10.1% | 10.1% |
| Quintile 5 | 0.0% | 0.0% | 0.0% | 0.0% | 0.0% |
|  | 100.0% | 100.0% | 100.0% | 100.0% | 100.0% |

The results are presented in Table 10. More than 95% of the informal employees distinguished by the revised Heintz and Posel approach are in quintile 1, the quintile displaying the strongest informal characteristics, and all informal employees are in the first two quintiles. A somewhat similar pattern is observed for the Stats SA method A, as slightly above three quarters of employees defined as informal by this approach are in quintile 1. In contrast, approximately 30% of the informal employees as distinguished by Stats SA method B are in each of the first three quintiles. Such a low proportion of informal employees being in the first (poorest) quintile

[20] The indicators are: Number of employees in the enterprise, permanence of work, written contract, employer contributes to pension or retirement fund, paid leave, employer makes UIF deductions, and employer makes medical aid or health insurance payments.

[21] This technique attaches the most weight to the indicators that are most unequally distributed, i.e., the greater the standard deviation of an indicator, the greater its weight. The range of indicators is analyzed to extract those linear combinations of the variables that capture the most common information. Each linear combination or principal component is uncorrelated with the others, in order to capture a different dimension in the data. The first principal component explains the most variation in the data, with successive components explaining additional but less variation. In this paper, only the first principal component is used for the construction of the index.

suggests that this method might capture informality too broadly, since some of these informal workers might not display strong informal characteristics.

## 4. MULTIVARIATE ANALYSIS OF FACTORS ASSOCIATED WITH INFORMALITY

The preceding analysis is limited in that it takes into account only one or two demographic variables when describing the characteristics of informal workers. However, many variables act together to determine whether the employed is identified as informal, in each of the five approaches discussed above. For this reason, probit regressions were run so as to estimate the marginal effects of different potential influences on the likelihood of informality under each approach in QLFS 2009Q4. The independent variables in the regressions include the demographic information (gender, race and age), educational attainment, geographical situation (province), broad industry category of the employed, as well as the number of children, elderly and self-employed in the household. The results are presented in Tables 11 and 12 for the self-employed and employees respectively.

Table 11: Probit estimates of the likelihood of the self-employed being informal, QLFS 2009Q4

|  | Stats SA method A | Stats SA method B | Revised Heintz & Posel | Revised Gasparini & Tornarolli | Revised Henley et el. |
|---|---|---|---|---|---|
| Gender |  |  |  |  |  |
| Female | 0.103 | 0.126 | 0.103 | 0.018 | 0.155 |
| Race (Reference group: White) |  |  |  |  |  |
| Black | 0.384 | 0.346 | 0.384 | 0.137 | 0.326 |
| Coloured | 0.120 | 0.100 | 0.120 | 0.024 | 0.188 |
| Indian | -0.019 | 0.011 | -0.019 | 0.019 | 0.039 |
| Age category (Reference group: 35-44 years) |  |  |  |  |  |
| 15-24 years | 0.073 | 0.156 | 0.073 | 0.011 | 0.202 |
| 25-34 years | 0.083 | 0.083 | 0.083 | 0.014 | 0.118 |
| 45-54 years | -0.017 | -0.017 | -0.017 | 0.012 | -0.019 |
| 55-65 years | -0.080 | -0.066 | -0.080 | 0.013 | -0.074 |
| Highest educational attainment (Reference group: No schooling) |  |  |  |  |  |
| Incomplete primary | -0.166 | -0.125 | -0.166 |  | -0.019 |
| Incomplete secondary | -0.299 | -0.271 | -0.299 |  | -0.058 |
| Matric | -0.527 | -0.473 | -0.527 |  | -0.259 |
| Matric + Certificate/Diploma | -0.658 | -0.614 | -0.658 |  | -0.367 |
| Degree | -0.734 | -0.724 | -0.734 |  | -0.538 |
| Other independent variables |  |  |  |  |  |
| Number of self-employed | -0.072 | -0.037 | -0.072 | -0.005 | -0.049 |
| Number of children | -0.008 | -0.005 | -0.008 | -0.001 | -0.015 |
| Number of elderly | 0.023 | 0.030 | 0.023 | 0.001 | 0.007 |
|  |  |  |  |  |  |
| Observed probability | 0.727 | 0.744 | 0.727 | 0.920 | 0.676 |
| Predicted probability (at x-bar) | 0.818 | 0.844 | 0.818 | 0.979 | 0.738 |
| Number of observations | 1 901 066 | 1 901 066 | 1 901 066 | 1 901 066 | 1 901 066 |
| Probability > Chi-squared | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 |
| Pseudo R-squared | 0.388 | 0.396 | 0.388 | 0.335 | 0.384 |

Note: Reported coefficients are the marginal effects (which in the case of binary variables are for a discrete change in the variable). In addition, all equations include broad industry controls and provincial controls. All independent variables on the table are significant at the 0.05 level.
Note: Due to the perfect collinearity between educational attainment and the likelihood of being informal (all self-employed without a bachelor degree are classified as informal), the educational attainment dummy variables are excluded in the probit estimates in the case of self-employed under the revised Gasparini & Tornarolli approach.
Note: Stats SA method A and revised Heintz and Posel approach define informal self-employed in the same way.

Looking at the self-employed, the results from Table 11 suggest that females and blacks are more likely to be classified as informal in all approaches, but the probability is the lowest in the revised Gasparini and Tornarolli methodology. This finding is consistent with what was observed in Table 5, i.e., the female and Black shares of informal self-employed as defined by this methodology are lower. In addition, the age dummies suggest that the probability of being identified as informal decreases in the older age categories, except in the revised Gasparini and Tornarolli methodology. Furthermore, as expected, a higher educational attainment results in a lower likelihood of informality. With regard to the influence of other explanatory variables, the self-employed are more likely to be informal if the number of elderly residing in the household increases, but the opposite happens if the number of children residing in the household increases. Finally, the self-employed are less likely to be defined as informal if there are already a lot of other self-employed members present in the household. To conclude, the results of Table 7 once again suggest that the revised Gasparini and Tornarolli approach, using worker characteristic – educational attainment – to distinguish the informal self-employed, might have captured a different group of workers.

Table 12: Probit estimates of the likelihood of the employees being informal, QLFS 2009Q4

|  | Stats SA method A | Stats SA method B | Revised Heintz & Posel | Revised Gasparini & Tornarolli | Revised Henley et el. |
|---|---|---|---|---|---|
| Gender | | | | | |
| Female | 0.005 | 0.058 | -0.014 | 0.013 | 0.013 |
| Race (Reference group: White) | | | | | |
| Black | 0.012 | 0.070 | 0.041 | 0.029 | 0.029 |
| Coloured | 0.006 | -0.075 | -0.001 | -0.037 | -0.037 |
| Indian | -0.015 | -0.051 | -0.034 | -0.038 | -0.038 |
| Age category (Reference group: 35-44 years) | | | | | |
| 15-24 years | 0.026 | 0.226 | 0.111 | 0.026 | 0.026 |
| 25-34 years | 0.015 | 0.118 | 0.041 | 0.015 | 0.015 |
| 45-54 years | -0.021 | -0.081 | -0.039 | -0.017 | -0.017 |
| 55-65 years | -0.009 | -0.111 | -0.047 | 0.007 | 0.007 |
| Highest educational attainment (Reference group: No schooling) | | | | | |
| Incomplete primary | 0.035 | -0.002 | 0.027 | 0.046 | 0.046 |
| Incomplete secondary | 0.007 | -0.104 | -0.027 | 0.010 | 0.010 |
| Matric | -0.029 | -0.328 | -0.103 | -0.037 | -0.037 |
| Matric + Certificate/Diploma | -0.044 | -0.526 | -0.096 | -0.065 | -0.065 |
| Degree | -0.051 | -0.557 | -0.095 | -0.072 | -0.072 |
| Other independent variables | | | | | |
| Number of self-employed | 0.017 | 0.025 | 0.057 | 0.016 | 0.016 |
| Number of children | -0.002 | 0.008 | -0.002 | -0.005 | -0.005 |
| Number of elderly | -0.001 | 0.018 | -0.002 | 0.003 | 0.003 |
|  | | | | | |
| Observed probability | 0.071 | 0.654 | 0.134 | 0.100 | 0.100 |
| Predicted probability (at x-bar) | 0.041 | 0.701 | 0.084 | 0.083 | 0.083 |
| Number of observations | 9 204 071 | 9 204 071 | 9 204 071 | 9 204 071 | 9 204 071 |
| Probability > Chi-squared | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 |
| Pseudo R-squared | 0.143 | 0.260 | 0.199 | 0.076 | 0.076 |

Note: Reported coefficients are the marginal effects (which in the case of binary variables are for a discrete change in the variable). In addition, all equations include broad industry controls and provincial controls. All independent variables on the table are significant at the 0.05 level.

Note: Revised Gasparini and Tornarolli and revised Henley et al. approaches define informal self-employed in the same way.

As far as the employees are concerned, the results from Table 12 show that, females are more likely to be defined as informal, except in the case of employees when the revised Heintz & Posel methodology is adopted. This might explain the much lower female share of informal employees from such an approach (30.3%, compared with about 40%-45% in the other approaches, as shown in Table 6). In addition, being Black is associated with a greater likelihood of being distinguished as informal under all approaches. In addition, younger age groups are more likely to be captured as informal employees in general. Furthermore, higher levels of educational attainment coincide with a lower likelihood of being informal, but this relationship only takes place in employees with at least Matric in Stats SA method A, revised Gasparini and Tornarolli and revised Henley et al. approaches, and for employees with at least incomplete secondary education in the case of the revised Heintz and Posel methodology. With regard to the influence of other independent variables on the probability of the employees being informal, the number of children and number of elderly in the households workers belong to have different impacts on this likelihood in different approaches, as the sign of the coefficients is positive in some regressions but negative in others. These two coefficients are both negative only if the Stats SA method A and revised Heintz and Posel approach are adopted. Finally, contrary to what was observed in the case of self-employed, employees are more likely to be captured as informal if the number of self-employed members in the household increases. However, this probability is the greatest in the revised Heintz and Posel approach (5.7%) compared with the other approaches (between 1.6% and 2.5%). Note that this positive relationship is also observed in Henley et al. (2009) when looking at the likelihood of employees being informal in the Brazilian economy.

## 5.    CONCLUSION

There is limited consensus on how to define informal employment in South Africa. This paper reviews Stats SA methodologies to measure informal employment before and after the introduction of the QLFS, as well as other recently proposed approaches, so as to investigate the congruence, if any, between the various measures of the rate of informality. Furthermore, econometric techniques are used to investigate commonalities and differences in the way in which the different measures of informality are associated with demographic, education, employment and household characteristics. The results suggest that estimates of informal employment are bigger if the revised Gasparini and Tornarolli and the Stats SA method B are adopted in the case of self-employed and employees respectively. Furthermore, the Gasparini & Tornarolli approach might have captured a slightly different group of informally self-employed, as the black share and female share are clearly lower, but the mean years of educational attainment are higher. Finally, the rate of informality becomes much greater with the application of Stats SA method B in the case of the employees. Does this mean that South Africa will no longer be regarded an international outlier regarding the size of the informal economy if such a broad definition of informal employment is adopted as in the Stats SA method B? Not answer can be given to this question, until such data are available by country.

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