Trends on the hours worked of the employed, 1997 – 2011

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ABSTRACT

This paper analyses trends in hours worked from South African household survey data for the period 1997 – 2011. The purpose of the paper is fourfold. First, the paper provides an overview on the trends in hours worked of formal sector employees, by various demographic and work characteristics. Second, the paper aims to establish how mean hours worked corresponded to the business cycle and third, the reliability of the Statistics South Africa hours worked data is assessed by comparing it with the data on hours working in the manufacturing sector by the Bureau of Economic Research (BER). Last, the newly derived hours worked variables are evaluated in terms of their usefulness as leading indicators, and how they can be used in productivity studies in the South African macroeconomic environment.

Keywords: Work hours, Business cycles, Formal sector employees, Manufacturing industry, South Africa
JEL codes: E32, J00

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1. Introduction

Hours worked is an important indicator for measuring consumer demand, output and productivity in the economy. During upswings and downswings, it often acts as a leading indicator, as hours worked is one of the first indicators to react to changing economic conditions. This is evidenced by the Stellenbosch University's Bureau of Economic Research (BER) hours worked indicator for the manufacturing sector. This indicator also forms part of the composite leading business cycle indicator published by the South African Reserve Bank (SARB). Previously hours worked data that was published by Statistics South Africa (Stats SA) formed part of the SARB's composite business cycle indicator. However, after discontinuation of this series Stats SA contain information on work hours in the 1995-1999 October Household Surveys (OHSs), 2000-2007 Labour Force Surveys (LFSs) and the Quarterly Labour Force Survey which was introduced in 2008[2].

In South Africa, as in many other countries, the current legislative trend is to reduce the length of the working week. In terms of legislation, the work week in South Africa was shortened from 46 hours to 45 hours in 1997 by means of the imposition of the Basic Conditions of Employment Act (BCEA) (Basic Conditions of Employment Act, 1997). The ultimate objective is to move towards a 40-hour work week. This paper aims to investigate changes, if any, that may have occurred in the number of hours worked by South African formal sector employees between 1997 and 2011 and to create a "hours worked" series that is comparable over time. The purpose of this series will be to enable the study of wider productivity measures, as well as to make it possible to follow 'hours worked' over the business cycle for a more accurate leading indicator in future.

The structure of the paper is as follows: Section 2 provides a literature review of past South African and international studies on the trends in hours worked variables. Section 3 investigates how the questions relating to hours worked were asked in the OHSs, LFSs and QLFSs. Section 4 analyses the trends in hours worked of formal sector employees, by various demographic (e.g., race, gender, province) and work (e.g., occupation, industry, union membership, public/private sector status) characteristics. The focus is to establish how mean hours worked corresponded to the business cycle. In Section 5, the reliability of the Stats SA hours worked data is assessed by comparing it with the data on hours worked in the manufacturing sector by the Bureau of Economic Research (BER). This is followed by Section 6, which investigates whether the hours worked variables are useful leading indicators, and how they can be used in productivity studies. Section 7 concludes the paper.

For the remainder of the paper, the OHSs will be referred to as OHS 1995, OHS 1996, etc., while the LFSs will be referred to as LFS 2000a (for the first round of LFS in 2000), LFS 2000b (second round in 2000), LFS 2001a, and so forth. The QLFSs will be referred to as QLFS 2008Q1 (for the first round of QLFS in 2008), QLFS 2008Q2 (second round in 2008), and so forth. All the data were weighted using the Census 2001 weights.

Finally, unless stated otherwise, only formal sector employees (excluding domestic workers and agricultural workers) whose usual weekly work hours at the time of the survey were between 1 hour[3] and 66 hours were included for the analyses. Based on the distribution of hours worked, it was decided to restrict the sample to the 95th percentile as to exclude outliers. Based on the BCEA the normal hours worked may not exceed 45 hours a week and 10 hours over time. However, these restrictions are not applicable to senior management as well as those who earned more than R89 455 per annum in 2000 and R115 572 in 2005. Based on the calculation of

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[2] OHSs and LFSs took place on an annual and bi-annual basis, respectively, while the current QLFS takes place on a quarterly basis.
[3] This is the official definition of employment by Statistics South Africa (Stats SA, 2010)

national accounts, all value added for all hours of work are included in the calculation. The aim was to not restrict the sample too much, but to include as many hours as reasonably possible. It was decided that a cut off at the 95th percentile resulted in a reasonable number of hours of 66, which includes a 'normal' 45 hour work week and 21 overtime hours. This will allow for 4 hours over time per day for a 5 day work week.

2.   Literature review

Hours worked has historically proven to be a strong leading indicator of economic activity because working hours is an aspect of labour input that can quickly be adapted to changing economic conditions (Layton and Moore, 1989: p385). As demand for production and output changes with the business cycle, it is easier and cheaper for employers to change working hours than to layoff, or hire employees, as changing hours require no long run commitment (Popkin, 1992: p 65 and Klein, 1990: p100).

According to Klein (2001) (BCI handbook) the average weekly hours work was one of the few variables which has consistently been included in the US business cycle leading indicator since 1938, confirming its strong and consistent leading ability. In South Africa, in 1994, overtime hours worked as a percentage of normal hours worked in manufacturing was included in the group of indicators comprising the leading business cycle indicator (Van der Walt and Pretorius, 1994). Unfortunately, the indictor had to be excluded in 2004, after the official statistical agency, Statistics South Africa, discontinued the publication of hours worked data (Venter and Pretorius (2004).

The rationale behind hours work as a leading indicator lies in labour demand theory, which show that firms will first adjust hours worked (in the short-term) and then only after being certain that the change in demand for output is permanent, will they employ or lay off workers (Glosser and Golden, 1997). It is therefore believed that the variation in hours worked is a reliable leading indicator of changes in coincident indicators. It seems however, that over time hours remain high in many industries, despite a long-term decline in actual hours and higher rates of unemployment being observed (also see Whitley and Wilson (1988)). Similar results were found by Martorana and Hirsch (2001). They concluded that work hours have continued to decline in Europe, but that they have increased dramatically in the US.

The challenge becomes one of measurement. How is time spent on producing goods and services measured accurately? Greenwood (2001) emphasised that hours worked is not a measure of how intensely or efficiently work is done but rather a measure of chronological time spent in work activities. Gali and Rabanal (2004) also found a strong positive co-movement between output and labour input measures and used data from the US to illustrate the relationship in terms of the business cycle.

The average work week in manufacturing is often used as a leading indicator, as it is easier to measure hours worked in this industry. Manufacturing hours is also a good leading indicator because it is assumed to adapt quickly to changing economic conditions, and thus it is expected to lead cyclical turning points in coincident indicators (Glosser and Golden, 1997 and Moore, 1983).

In contrast, DeLeeuw (1991) argue that hours worked may not be such a good indicator as employers can skip cutting or increasing work hours, and directly increase or decrease their labour force, yielding false signals. However, Moore (1983) warns that indicators such as hours worked should ideally not be evaluated as a leading indicator by itself, but should form part of a suite of indicators, that combine into a single leading index. This will lead to the small term

movements, and false signals to be eliminated, while the synchronised movements of hours worked with other leading indicators are magnified.

In the absence of data since 2004 in South Africa, there has been a growing need for an accurate hours worked indicator. This indicator can play an important part in the suit of indicators in the composite leading business cycle indicator, but will also be useful for productivity and labour costs measures.

Greenwood (2001) distinguishes between two main different sources of collecting hours worked data: establishment-based surveys[4] and household-based surveys[5]. Household-based surveys rely on information provided by individuals responding to a standard questionnaire. Greenwood (2001) can be consulted for an overview on the benefits of using household surveys. In terms of drawbacks, Greenwood (2001) suggests that respondent can make recall errors in that they may report normal hours of work, forgetting certain events that were unusual or temporary. Respondent can also make proxy response errors in that household members could be reporting on behalf of other members, providing inaccurate information. Furthermore, respondents may not know what is classified as work, and could report time spent on other activities that are not classified as work. Lastly, respondents may on purpose provide inaccurate information, especially if they are involved in illegal activities.

In South Africa, three prominent household surveys were undertaken by Statistics South Africa in which questions on hours worked were surveyed. The first was the October Household Survey (OHS) that covered the period from 1994 to 1999, although only on an annual basis. Next was the Bi-annual Labour Force Survey (LFS) that covered the period from 2000 to 2007. In a first attempt to create an indicator for hours worked, Oosthuizen and Goga (2007) investigated the changes in hours worked from 2000 to 2007 using the various LFSs. The authors however make use of the income variable as well as the Basic Conditions of Employment Act (BCEA) stipulations to restrict the sample. The sample includes all formal sector (including domestic workers) employed by one or more employers. Based on the BCEA they also restrict the sample to those who work more than 24 hours a month in their main job and who earned above R89 455 per year in 2000 and R115 572 in 2005. Based on their BCEA restrictions, those working between 45 and 55 hours a week are within the limit of the BCEA act. This includes a maximum of 45 normal hours and 10 overtime hours. The authors found that on average in 2000 the restricted sample worked around 47.6 hours per week (including overtime). The average for 2005 was 49.1 hours.

This paper builds on the work done by Oosthuizen and Goga (2007), although the paper aims to develop a proxy for output and productivity, and therefore hours are only adjusted for outliers by restricting the sample to the 95th percentile. Note that this is the only the second South African study that investigated trends in hours worked.

3.   Information on hours worked in stats sa surveys

This section examines how the information on hours worked were captured in the OHSs, LFSs and QLFSs. Table 1 summarizes how the hours worked questions were asked in each survey. In OHS 1993 – 1996, the respondents were not asked to declare the usual weekly work hours, but were only asked to report the hours worked in the last seven days. A drawback of the latter question is that it did not clearly indicate to the respondents if they should declare the work hours from the main job only, or rather total work hours from all activities (keep in mind that it

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[4] Quarterly Employment Statistics (QES) by Stats SA is a South African example.
[5] OHSs, LFSs and QLFSs are South African examples.

is possible that some employed could have more than one job at the time of the survey)[6]. Another drawback is that the respondents might be unsure if the answer on hours worked in the last seven days should include over-time work hours. The usual weekly hours worked question was asked since OHS 1997[7] and it was asked in the same way until OHS 1999. The question on the hours worked in the last seven days was still asked in the same way in 1997-1999 as in 1995-1996.

Since the OHS was replaced by LFS in 2000, the two work hours questions were asked differently. Both questions clearly indicated that the respondents must take over-time work hours into consideration in their answers. In addition, in both questions, the employed were required to clearly distinguish "(a): work hours from the main job/activity" from "(b): the work hours from other work activities". For the remainder of the paper, when analysing the LFS hours worked variables, they stand for the respondents answers on (a) only. One problem of the way the hours worked questions were asked was that, it is impossible to distinguish the over-time work hours from normal work hours. Only the combined total is known.

The LFS was replaced by QLFS since 2008. In the QLFS, once again, the respondents were asked to report both the usual weekly work hours and work hours in the last seven days. In addition, in the usual hours worked question, the respondents were required to report the work hours from the first job/business, the second job/business, and all other jobs/businesses. In contrast, in the question on the hours worked in the last seven days, the respondents were asked to report the work hours on each day of the week in each job/business. A shortcoming of the questions was that, the keywords 'first job/business' and 'second job/business' might not be completely clear to the respondents. Although these words seem to imply that the first job stands for the respondents' main job, there is no guarantee that all respondents would interpret in this way. Another drawback is that, as in what happened in the LFSs, it is impossible to distinguish over-time work hours from normal work hours. For the remainder of the paper, when QLFS hours worked variables are analysed, the variables stand for the respondents' hours worked in the first job/business only, and it is assumed that the first job/business means their main job/business.

To conclude, in all surveys under study, the hours worked variables could not help distinguishing the normal work hours from over-time work hours. Hence, later in the analyses, a proxy variable called 'difference' will be created, which stands for the difference between hours worked in the last seven days and usual weekly hours worked. If the answer of this difference variable is positive, it would imply that there is an increase of demand in the economy (i.e., an upswing in the business cycle) as the workers worked longer than usual in the last seven days at the time of the survey due to reasons like increase in consumer demand and hence production. If the opposite happens (i.e., the difference is negative), it implies that there is a decrease of demand in the economy (i.e., a downswing in the business cycle). These correlations with the business cycle may however happen with lead and lag time-intervals.

4.   Trends in usual weekly hours worked of formal sector employees

This section only considers the restricted sample from OHS 1997 to QLFS 2011Q4, i.e. formal sector employees, working 66 hours or less a week, including overtime. Domestic workers and agricultural workers are excluded. Furthermore, Table A.1 in the Appendix shows that only a negligible proportion of formal employees reported zero or unspecified usual hours worked, so

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[6] It was only since the inception of QLFS in 2008 that the questionnaire clearly asked the respondents if they had more than one job at the time of the survey, and these workers with more than one job as a percentage of all employed hovered around the 0,5-1,0% range in QLFS 2008-2010.

[7] Coincidentally, it was also since OHS 1997 that it became possible to distinguish formal sector workers from informal sector workers, in the case of employees.

the results of the forthcoming analyses should not be significantly different, even after excluding these responses

4.1 Changes in hours worked

Since 2004 there has been a steady increase in the proportion of formal sector employees who usually work 1- 40 hours a week from around 40 per cent to above 56 per cent. This could largely be due to more companies employing workers on a contractual, part-time, half-day basis. Around 76 per cent of formal sector employees work between 1 and 45 hours a week. Figure 1 shows that there is a clear upward trend in the proportion of formal employees working 40 hours or below (and also 45 hours or below) since 2008.

Figure 2 shows that until LFS 2007b, with the exception of LFS 2000a and LFS 2001a, the number of formal employees increased. However, between 2008 and 2010, formal employment declined in most of the survey rounds under study. The decline was most serious in percentage terms in QLFS 2009Q3 (a decrease of 3.0%).

One caveat of this paper is that data are not seasonally adjusted. However, when looking at the quarter-on-quarter growth rate of formal sector employment, a clear peak can be identified in the third quarter of 2007. This is in line with the start of the down cycle in December 2007, as dated by the SARB. There is a clear indication that although employment numbers only clearly declined from the fourth quarter of 2008, employment growth largely coincided with the coincident business cycle indicator.   The question however is now whether hours worked could provide some additional lead time on the employment growth variable.

Figure 3 shows what happened to the usual hours worked distribution in QLFS 2011Q4, and it can be seen that 45.7% and 19.9% of employees reported they usually work 40 hours and 45 hours per week respectively. Figure 4 shows the cumulative distributions of usual hours worked in selected surveys. It also shows an upward trend in the proportion of employees working 40 hours or below. Finally, Figure 5 shows that the usual hours worked showed a downward trend between QLFS 2007Q1 and QLFS 2009Q2, where after it stabilised somewhat. This downward trend could be attributed to the impact of the global recession.

Trends in hours worked would be investigated in greater detail by various demographic, education and work characteristics in Sections 4.2 and 4.3.

4.2 Demographic characteristics

4.2.1 Gender

Over the past few decades the role of females in the labour market has become more prominent, with more females joining the labour force (see Lee, McCann and Messenger, 2007). There is however a big difference between male and female labour market participation. In South Africa in 2011Q4 male labour force participation rate was 61,1 per cent (internationally 79,4 per cent in 2003) and 47,9 percent for females (internationally 53,9 per cent). In line with international findings (Lee, McCann and Messenger, 2007), South African males worked longer hours on average during the whole period under study, as shown in Figure 6.

The factors accounting for the longer mean male hours worked could be the follows:
• Female formal sector employees are more educated (half of male formal workers have at least Matric since 2008, whereas this proportion is nearly two-thirds for female formal workers), and hence are more likely to be involved in highly-paid occupations with shorter work hours.

- A higher proportion of female workers (about 35 per cent) are engaged in highly-skilled occupations (with shorter work hours), while this proportion is only about 25 per cent in the case of males.
- The proportion of female formal workers who are married (about 60 per cent in 2011) is higher than the proportion in the case of male formal workers (50 per cent in 2011). Female workers who are married might only work on a part-time or casual basis, which is characterised by shorter work hours.
- Males might also be more career driven, resulting in them working longer hours, compared to females.

4.2.2   Race

It is expected that there are differences in the average hours worked across the race categories, due to their different educational and occupational profiles, influenced by the apartheid system. Figure 7 shows that blacks work longer hours on average. This could be because a higher proportion of blacks are relatively less educated, and hence would be more involved in unskilled occupations involving longer working hours.

For instance, in QLFS 2011, the mean years of educational attainment of black formal sector employees is 'only' 10,7 (although increasing from just above 9 in OHS 1997), while the mean years of education for coloureds / Indians / whites are about 11 years / 12,2 years / 12,8 years respectively. Furthermore, it is found that in QLFS 2011, the proportion of blacks involved in unskilled occupations is 22 percent, but this proportion was 18 percent, 4 percent and only 1.5 percent for coloureds, Indians and whites respectively[8]. So these findings could explain why the relatively less educated and unskilled blacks worked longer hours on average.

4.2.3   Gender and race

Figure 8 presents the mean usual weekly hours of formal employees by gender and race, with Indians excluded. The results show that black males worked longer hours on average in all of the years, regardless of race, followed by white males. Looking at the females in each race, the blacks and coloureds clearly worked longer hours than whites. In addition, the mean hours worked of coloured females exceeded that of black females since 2010.

4.2.4   Age

The employed are divided into five age cohorts, and Figure 9 shows that employees in the 15-24, 25-34 and 35-44 years cohorts clearly worked longer hours on average in the QLFSs, however, the downward trend in mean work hours was more rapid in 2008-2011 in the two older age cohorts (45-54 years and 55-65 years). This trend however, was different in the late 1990's and early 2000's. Lee, McCann and Messenger (2007) found similar results during the 2000's, in that for five of the seven countries in their analysis, younger workers (under the age of 25) had somewhat shorter average weekly hours then those who were older. Hours worked then reached a plateau between the ages of 25 and 54, whereafter, as workers aged, average weekly work hours started to decline.

The obvious gap in mean work hours between the younger group and the 45-65 years group can be attributed to the fact that early retirement happened in the latter group, but they are re-employed, albeit working shorter hours, i.e., half-day, part-time position. (Example: 'retired' lecturers / professors at universities only working half-day upon re-employed on contract basis).

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[8] The proportions of workers involved in highly-skilled occupations (characterised by shorter work hours) in QLFS 2011Q4 are 20 percent for blacks, 30 percent for coloureds, 43 percent for Indians and 58 percent for whites.

Also, elderly people are more experienced and are more likely to be involved in those senior-ranked, highly-skilled occupations with shorter work hours (compared with the younger people who start at the bottom, with some of them involved in unskilled occupations, characterised by long work hours or out to still prove themselves in the competitive working world).

4.3   Other covariates

4.3.1   Province of residence

Table 2 presents the mean usual weekly work hours of formal employees by province, Those from North West, Mpumalanga and Limpopo worked the longest hours, while those from Western Cape and Eastern Cape worked the shortest hours, on average[9]. The results could be due to the fact that most of the highly-skilled workers (who worked shorter hours) are concentrated in the Western Cape, and the proportion of workers with non-permanent employment (characterised by part-time, shorter work hours) is higher in the Eastern Cape.

It can also be seen from Table 2 that there is a steady decline in hours worked across most provinces, and this could be indicative of an increase in the number of 'decent' jobs created, especially in the poorer provinces.

It is interesting that Gauteng, despite the province with the highest proportion of formal employees involved in highly-skilled occupations (30.6% in QLFS 2011Q4) and with at least Matric (61.7% in QLFS 2011Q4), was the province with the third lowest mean usual weekly hours worked in OHS 1997 but ended up as the province with the second highest mean usual weekly hours worked in QLFS 2011Q4. Also, Gauteng and Western Cape are the only two provinces experiencing an increase of the mean hours worked between OHS 1997 and QLFS 2011Q4. This could be due to the immigration of relatively less educated workers from other provinces who successfully sought semi-skilled and unskilled work characterized by longer work hours in these two provinces.

4.3.2   Highest educational attainment

From Figure 10 and Table 3, it can be seen that in the earlier surveys, the mean usual weekly hours worked of formal employees were the highest for those with low education. However, in recent surveys, there was drastic decline in average hours worked for those with no or only primary education.

This finding could substantiate that there were more decent jobs (characterised by better working conditions such as shorter work hours) created over this time period for those with very little education. Interestingly enough, the same trend is also observed for those employees who had a degree. However, it is also possible that, as the economy demands high-skilled and educated workers, the unskilled workers with low educational attainment are no longer in great demand, and if they are employed, some of them might only be employed on a part-time basis. Hence, this also explains why the mean usual hours worked of those in the "none" and "primary" categories are lower than the mean usual hours worked of those in the "secondary" and "Matric" categories in more recent surveys.

4.3.3   Trade union membership

Given the bargaining of unions, as well as the scope for reducing working hours via the bargaining councils, one would expect that union members may work shorter hours than non-union members. However, this finding was not observed in Figure 11. For instance, surprisingly,

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[9] If we put in the averages between 1997 and 2011, it shows that the poorer provinces work more hours on average.

formal employees who were trade union members at the time of the survey worked longer hours on average in some surveys (e.g., 1997-2001). In addition, the mean hours worked of members and non-members were very close since 2003 (except LFS 2005b). The latter finding could be due to cases where minimum wage agreements are extended to all workers in the whole industry (collective bargaining), regardless of their collective bargaining council or trade union membership status.

4.3.4 Public/Private sector

Figure 12 presents the mean hours worked of public and private sector employees respectively, and it can be seen that the gap between average hours worked in the two sectors has increased over time. A possible reason for this could be that there is less competition and greater job security in the public sector, and workers are often not rewarded for overtime work. While workers in the private sector often receive overtime pay and due to the stronger competition, often work longer hours to improve their output.

In addition, Figure 12 shows that private sector workers work on average around 44 hours a week, while those in the public sector work around 40 hours a week in recent surveys. For the latter group of workers, the mean hours worked are extremely stable since QLFS 2008Q2 at 40 hours.

4.3.5 Occupation

It is expected that those involved in more skill-intensive sectors work shorter hours, and the results from Table 4 confirms this, as employees from categories [E]: service workers and shop and market sales as well as [H]: plant and machinery operators and assemblers worked the longest hours, while those from the highly-skilled categories like [B]: professionals and [C]: technicians and associate professionals worked shorter hours, on average. The skilled agricultural and fishery workers (i.e., category [F]) worked the shortest hours on average amongst the nine groups of occupations, being the only group with mean hours worked below 40 (at 36.7 hours in QLFS 2011Q4). This could be due to the fact that some of these workers only work on a part-time basis, or are seasonal workers.

Figure 13 shows the mean work hours by skills level of occupation, and it is clear that since 2008, the mean work hours of unskilled employees showed the most rapid decline, while it is interesting that the mean work hours of highly-skilled employees are quite stable during the 2008-2010 slowdown period. In addition, the mean work hours of semi-skilled workers are the highest in all surveys under study, except OHS 1997.

Furthermore, the mean hours gap between unskilled and highly-skilled workers has almost diminished in the last two QLFSs of 2011. This is attributed almost entirely to the rapid decline of mean work hours of unskilled people in 2009-2011 (the mean work hours of highly-skilled workers are actually quite stable at about 41 hours). It could be that the rapid decline of mean work hours of unskilled workers can be linked to the recent economic slowdown. That is, due the slowdown, employers would as a first option first let go of unskilled workers or employ the unskilled workers on a casual, part-time, half-day basis, to reduce production cost.

4.3.6 Industry

Table 5 shows that employees from the categories [A]: mining and quarrying, [F]: wholesale and retail as well as [G]: financial, insurance and business services had the longest mean work hours, while those from [H]: community, social and personal services had the shortest mean work hours. Note that group [H] mostly consists of public sector employees. In addition, the mean

work hours in the primary and secondary industries clearly showed a downward trend between 1997 and 2011, but this did not take place when looking at the tertiary industries. Hours worked of manufacturing workers will be analysed in greater detail later.

4.3.7   Job length

Figure 14 shows that permanent workers had longer mean work hours in all surveys under study, despite the fact that there seems to be a consistent decline (especially between 2000 and 2007) in their mean hours worked. The relatively shorter average work hours of non-permanent workers is probably due to the fact that, they work part-time, half-day, or are casually employed.[10]

4.4   Summary

Section 4 investigated the mean usual weekly work hours of formal sector employees by demographic, educational attainment and work characteristics between 1997 and 2011, and it was found that black males, aged younger than 45 years, residing in Mpumalanga, North West or Limpopo, without post-Matric qualifications, who were permanently employed, and were involved in semi-skilled occupations as service workers, trade workers, plant and machinery operators and assemblers, as well as mining and quarrying in the primary industry or wholesale and retail in the tertiary industry were more likely to work longer hours on average.

5.   Comparability between OHS/LFS/QLFS manufacturing hours worked with BER manufacturing hours worked variables

In this section, the OHS/LFS/QLFS average manufacturing usual weekly work hours are analysed in detail. These data are then compared with the BER manufacturing hours worked indices. First, Figure 15 shows that the manufacturing industry's contribution to gross value added declined rapidly between 2008Q2 and 2009Q2, mainly as a result of the impact of the global recession.

Figure 16 shows that the proportion of formal manufacturing employees usually working 40 hours or below as well as 45 hours or below has a clear upward trend in general during the period under study. In addition, it can be seen from Figure 17 (and the third column of Table 5) that the usual weekly work hours decreased from 44,2 in OHS 1997 to 43,3 in QLFS 2011Q4, with a very rapid decline taking place between LFS 2005b and QLFS 2009Q2.

As mentioned in the introductory section, the BER releases an index on average hours worked of manufacturing workers. This index reflects trends and not actual measured amounts, as the respondents indicate "up", "same" or "down" when comparing a current activity with that of a corresponding quarter of a year ago. These responses are quantified by converting them into percentages and portraying them as net balances, i.e., the difference between percentages "up" and percentages "down". In this manner, the net balances vary from -100 to 100, where:
- -100 = the most negative response
- 0 = a situation of no change
- 100 = the most positive response

Thus, a net balance above 0 indicates that more respondents assessed an "up" than a "down", in other words an improvement from the situation during the corresponding quarter a year ago. A

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[10] The proportion of formal employees without permanent employment increased from 15,2 per cent in OHS 1999 to 25,7 per cent in QLFS 2011Q4. These non-permanent workers are more likely to work on a part-time, half-day basis, and hence this partly explains the downward trend in hours worked (See Figure 5), in addition to reasons like recent global recession and the move towards a 40-hour work week as a result of the imposition of the Basic Conditions of Employment Act.

net balance below 0 registers a majority of "down" responses, in other words deterioration from the situation during the corresponding quarter a year ago (Kershoff, 2000).

Figure 18 shows the BER index between 1995 and 2011, and a rapid downward trend is observed in 2007 and 2008.

Figure 19 implies that there is a very good correlation between the BER manufacturing work hours index and the OHS/LFS/QLFSs mean usual hours worked variable. Both show a similar downward trend in 2007-2008. It seems that the OHS/LFS/QLFSs mean usual hours worked variable, however, turned slightly earlier than the BER manufacturing work hours index at the start of the downturn, while the latter turned slightly earlier at the bottom of the cycle.

6.   Hours worked variables as leading business cycle indicators

This section investigates if hours worked variables are leading business cycle indicators. First, Figure 20 compares the quarter-to-quarter real GDP percentage change with the OHS / LFS / QLFS usual weekly hours worked, and it can be seen that the latter variable already showed a downward trend from LFS2007a, before the quarter-to-quarter real GDP showed a negative growth rate from QLFS2008Q3. Furthermore, Figure 2 from Section 4.1 shows that formal employment started declining at the end of 2008. To sum up, the decline in mean usual weekly hours worked preceded the decrease of real GDP growth and formal employment, and this implies that the hours worked variable could be a leading business cycle indicator.

Figure 21 compared the same two variables, but the focus is on the manufacturing industry, and it can be seen that the mean usual weekly work hours of manufacturing employees already started a downward trend in general from LFS2005a, before the quarter-to-quarter real gross value added of manufacturing industry showed a negative growth rate from QLFS 2008Q2 until QLFS 2009Q4. Also during LFS 2000a and LFS 2003b there was a drop in mean hours worked just before the manufacturing industry entered into recession from September 2002 until September 2003 (see Venter (2010)). This once again indicates that the hours worked series could be an accurate and good leading indicator, as the indicator turned long before manufacturing growth actually declined.

Figure 22 compares the work hours in the last seven days and mean usual weekly hours worked of formal employees. In 2008-2010 (downward phase of the business cycle), a higher proportion of formal employees have the difference variable being negative (i.e., last-7-days hours worked is smaller than usual weekly hours worked). This implies a weaker consumer demand, as the formal employees work shorter hours than usual. Note that this proportion is the highest in QLFS 2009Q2, and during the same period, economic recession was the most serious (quarter-to-quarter real GDP decreased by 2.6%, as shown by Figure 20 above).

Figure 23 shows what happened in the manufacturing industry. Similar findings are observed.

7.   Conclusion

This paper showed that the hours worked variable from household surveys can be informative as an indicator of economic activity and diversity. It was shown that it is possible to create a series from 1997 – 2011, combining questions from OHS, LFS and QLFS, even if there were some differences in the underlying surveys questions and methodology. The results also showed a strong correlation between the average hours worked and the latest downswing in the South African business cycle.

In terms of demographics, the results indicated that males worked longer hours on average than females. In terms of race the data showed that on average blacks worked longer hours, while the age profile indicated that younger workers worked longer hours on average. These findings were also in line with international studies, confirming our confidence in the QLFS hours worked data.

Another significant finding is that there is a large and increasing gap between average hours worked in the private and public sectors. In terms of skills, there seems to be a narrowing the gap in hours worked between semi-skilled and unskilled workers over the period under review. Further investigation into these causes may be warranted.

In an attempt to analyse the quality and reliability of the cyclicality of the hours worked variable from the household survey data, the hours worked in manufacturing from the household surveys was compared to an independent opinion survey on hours worked in the manufacturing sector. The results showed a strong correlation between the two series.

Lastly, the lead of eight quarters in the hours worked variable provides enough evidence to suggest that by using the hours worked variable form household survey data can be a useful leading indicator and could perhaps be of practical use in productivity measures. To further enhance the use of this indicator, econometric analyses, such as impulse response functions, might proof to be useful in future.

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Table 1: Hours worked questions asked in OHSs, LFSs and QLFSs

	Usual weekly work hours	Work hours last 7 days
OHS 1993 – 1996	Not asked	How many hours did … actually work during the past 7 days?
OHS 1997 – 1999	How many hours per week does (the person) usually work?	How many hours did (the person) actually work during the past 7 days?
LFS 2000a – 2007b	How many hours per week, including over-time, does ……usually work (a) In his/her main job/activity (b) In all other work activities (c) In total Note: (c) = (a) + (b)	How many hours, including over-time, did …… work during the last seven days (a) In his/her main job/activity (b) In all other work activities (c) In total Note: (c) = (a) + (b)
QLFS 2008Q1 – 2010Q4 (For those with one job)	How many hours do you usually work each week?	Thinking of each day last week, how many hours did you actually work (a) On Monday? (b) On Tuesday? (c) On Wednesday? (d) On Thursday? (e) On Friday? (f) On Saturday? (g) On Sunday? Total hours actually worked (= sum of these 7 answers)
QLFS 2008Q1 – 2010Q4 (For those with more than one job)	How many hours do you usually work each week? (1) In your first job/business? (2) In your second job / business? (3) In all other jobs / businesses? Total hours for all jobs / businesses (= sum of these answers)	Thinking of each day last week, how many hours did you actually work (a) On Monday? (b) On Tuesday? (c) On Wednesday? (d) On Thursday? (e) On Friday? (f) On Saturday? (g) On Sunday? in first job / business? (The same 7 sub-questions above were asked again regarding the second and third jobs / businesses, and then all the answers were added to derive the total work hours in the last 7 days)

Source: Stats SA

Table 2: Mean usual weekly hours worked of formal sector employees by province, 1997-2011

	WC	EC	NC	FS	KZN	NW	GAU	MPU	LIM	All
OHS 1997	42.2	41.8	43.9	45.6	43.3	45.2	42.7	45.6	43.7	43.3
OHS 1998	41.5	42.3	44.2	46.6	44.2	46.0	42.8	46.2	42.7	43.5
OHS 1999	42.2	42.5	44.4	45.5	44.0	44.5	43.4	45.5	43.5	43.6
LFS 2000a	44.5	43.7	43.8	46.6	45.0	45.1	44.7	45.9	44.5	44.8
LFS 2000b	42.6	42.4	44.3	45.2	44.0	45.7	44.7	45.1	44.9	44.2
LFS 2001a	42.5	43.4	44.8	46.0	44.9	46.9	45.0	46.1	45.3	44.7
LFS 2001b	42.4	43.0	44.6	45.2	45.0	45.8	44.1	46.5	44.5	44.3
LFS 2002a	43.1	42.5	43.5	45.7	44.1	45.6	44.2	45.7	44.8	44.2
LFS 2002b	43.8	42.5	45.1	45.7	45.2	45.9	44.6	46.1	45.1	44.7
LFS 2003a	43.1	42.1	42.9	45.1	44.3	45.8	43.7	46.1	44.4	44.0
LFS 2003b	42.6	41.9	44.0	44.3	43.5	45.9	43.9	45.6	44.0	43.8
LFS 2004a	42.9	42.7	44.5	44.6	44.6	45.7	44.3	45.5	44.1	44.2
LFS 2004b	42.8	41.6	44.0	43.9	44.8	45.1	44.0	45.7	44.1	43.9
LFS 2005a	43.1	42.2	44.5	45.2	44.3	45.1	44.1	45.6	44.4	44.1
LFS 2005b	43.0	42.0	44.9	44.5	47.5	45.5	44.2	45.7	46.0	44.7
LFS 2006a	42.2	42.2	43.6	44.5	44.2	44.6	43.8	45.6	44.3	43.7
LFS 2006b	42.3	41.4	43.5	43.8	44.4	44.9	44.0	45.8	43.9	43.7
LFS 2007a	42.9	41.9	44.1	44.6	43.7	46.2	44.0	45.8	44.6	43.9
LFS 2007b	42.1	41.4	43.4	43.6	43.5	44.4	43.1	44.8	43.7	43.1
QLFS 2008Q1	43.1	42.5	43.0	44.0	43.4	44.7	43.8	44.9	44.5	43.6
QLFS 2008Q2	42.5	42.3	42.9	43.4	43.4	44.1	43.4	44.8	43.4	43.3
QLFS 2008Q3	42.4	42.5	42.7	43.1	43.3	44.3	43.6	44.3	43.5	43.3
QLFS 2008Q4	42.6	42.5	43.1	42.9	43.0	43.9	43.3	44.3	43.4	43.1
QLFS 2009Q1	42.6	42.2	42.7	43.2	42.9	43.7	43.3	44.4	44.0	43.1
QLFS 2009Q2	41.9	42.0	42.6	43.1	42.4	43.6	42.9	45.1	43.5	42.8
QLFS 2009Q3	42.1	41.7	42.3	43.0	42.2	44.2	43.1	44.7	43.9	42.8
QLFS 2009Q4	42.6	42.3	42.9	43.1	42.2	43.8	43.4	44.9	44.4	43.1
QLFS 2010Q1	42.2	42.0	42.0	42.7	42.3	44.0	43.0	44.9	44.2	42.9
QLFS 2010Q2	42.4	41.7	42.0	42.7	42.2	44.0	42.9	44.8	43.6	42.8
QLFS 2010Q3	42.5	42.0	43.0	42.9	42.4	44.0	42.9	44.3	43.9	42.9
QLFS 2010Q4	42.4	41.8	42.3	42.5	42.3	43.9	43.0	44.7	43.8	42.8
QLFS 2011Q1	42.6	41.7	42.7	42.1	42.7	43.8	43.2	44.4	43.6	42.9
QLFS 2011Q2	42.6	41.5	41.8	41.6	42.5	43.0	43.3	44.2	43.0	42.8
QLFS 2011Q3	42.9	41.2	41.3	42.4	42.8	43.1	43.2	44.9	42.7	42.9
QLFS 2011Q4	42.6	41.5	42.1	42.9	42.6	42.9	43.4	44.9	42.9	42.9

Source: Own calculations using OHS/LFS/QLFS data.

Table 3: Mean usual weekly hours worked of formal sector employees by highest educational attainment, 1997-2011

	None	Primary	Secondary	Matric	Matric + Cert/Dip	Degree	All
OHS 1997	45.3	45.2	44.3	42.8	40.5	40.4	43.3
OHS 1998	45.4	45.4	44.5	43.0	40.8	40.5	43.5
OHS 1999	46.1	45.7	44.3	43.3	40.2	42.0	43.6
LFS 2000a	46.9	47.5	45.4	44.7	41.8	42.5	44.8
LFS 2000b	47.0	46.0	44.9	43.9	41.6	42.9	44.2
LFS 2001a	46.9	46.7	45.7	44.7	41.5	42.5	44.7
LFS 2001b	46.5	46.3	45.2	44.1	41.5	42.4	44.3
LFS 2002a	44.8	47.0	45.1	44.0	41.2	42.1	44.2
LFS 2002b	46.2	46.7	45.8	44.4	41.8	43.3	44.7
LFS 2003a	46.7	45.5	44.7	43.8	41.5	42.7	44.0
LFS 2003b	46.2	45.2	44.5	43.7	41.5	42.2	43.8
LFS 2004a	46.1	45.6	45.2	44.2	41.7	41.7	44.2
LFS 2004b	45.5	44.8	44.8	44.0	41.1	42.1	43.9
LFS 2005a	45.6	45.0	45.1	44.4	41.0	41.6	44.1
LFS 2005b	45.1	46.2	45.6	44.7	42.7	42.2	44.7
LFS 2006a	44.9	45.2	44.3	44.1	41.4	41.3	43.7
LFS 2006b	44.8	44.9	44.6	43.8	41.3	42.0	43.7
LFS 2007a	45.8	45.0	44.7	43.9	42.2	42.2	43.9
LFS 2007b	43.6	44.3	43.9	43.4	41.4	41.1	43.1
QLFS 2008Q1	43.9	44.3	44.8	43.8	41.6	41.2	43.6
QLFS 2008Q2	43.8	43.8	44.2	43.5	41.5	40.6	43.3
QLFS 2008Q3	42.8	43.9	44.1	43.6	41.8	40.9	43.3
QLFS 2008Q4	42.8	43.8	44.0	43.4	41.6	41.0	43.1
QLFS 2009Q1	42.4	43.6	44.1	43.5	41.5	41.1	43.1
QLFS 2009Q2	41.6	42.9	43.8	43.1	41.4	40.4	42.8
QLFS 2009Q3	42.8	43.1	43.7	43.3	41.6	40.5	42.8
QLFS 2009Q4	41.8	43.4	44.1	43.4	41.5	40.7	43.1
QLFS 2010Q1	41.1	42.9	43.8	43.3	41.5	40.5	42.9
QLFS 2010Q2	41.4	42.4	43.7	43.0	41.5	40.9	42.8
QLFS 2010Q3	42.6	43.0	43.6	43.2	41.8	40.7	42.9
QLFS 2010Q4	42.4	43.1	43.7	43.2	41.5	40.6	42.8
QLFS 2011Q1	41.4	42.6	43.7	43.5	41.6	40.7	42.9
QLFS 2011Q2	40.6	41.8	43.6	43.4	41.6	40.5	42.8
QLFS 2011Q3	41.4	43.1	43.4	43.4	41.9	40.7	42.9
QLFS 2011Q4	41.7	41.2	43.7	43.7	41.9	40.3	42.9

Source: Own calculations using OHS/LFS/QLFS data.

Table 4: Mean usual weekly hours worked of formal sector employees by broad occupation category, 1997-2011

	Highly-skilled			Semi-skilled					Unskilled	All
	[A]	[B]	[C]	[D]	[E]	[F]	[G]	[H]	[I]	
OHS 1997	44.5	39.5	41.7	42.1	44.2	43.6	44.7	45.2	44.1	43.3
OHS 1998	44.7	40.0	40.4	42.1	44.7	44.8	45.2	46.0	44.1	43.5
OHS 1999	45.3	40.5	40.9	41.9	45.2	44.5	45.5	46.0	43.7	43.6
LFS 2000a	47.1	41.5	41.2	42.8	46.5	45.4	47.3	47.5	44.6	44.8
LFS 2000b	45.1	42.7	41.5	42.5	45.2	44.3	46.0	46.6	44.4	44.2
LFS 2001a	45.3	41.0	42.0	42.8	46.9	45.7	46.7	47.2	44.9	44.7
LFS 2001b	45.2	42.4	41.0	43.0	45.7	45.2	45.8	46.6	44.9	44.3
LFS 2002a	45.0	41.4	41.5	42.8	46.1	41.4	46.4	46.4	44.2	44.2
LFS 2002b	45.5	43.0	41.8	43.0	46.8	44.6	46.1	47.1	45.2	44.7
LFS 2003a	45.2	41.6	41.2	42.3	45.9	43.1	45.6	46.0	44.0	44.0
LFS 2003b	44.2	41.7	40.9	42.5	45.0	48.6	45.4	45.9	44.0	43.8
LFS 2004a	44.8	41.1	41.4	42.8	45.8	42.8	45.8	46.6	44.4	44.2
LFS 2004b	44.4	41.6	41.1	42.6	45.5	47.7	45.6	45.7	43.9	43.9
LFS 2005a	44.9	41.1	41.0	42.6	45.6	46.4	46.1	46.2	43.8	44.1
LFS 2005b	45.2	41.7	41.9	42.9	46.4	44.7	46.7	47.2	44.7	44.7
LFS 2006a	44.7	40.6	41.1	42.5	45.2	45.4	45.6	45.5	43.6	43.7
LFS 2006b	44.1	41.3	40.9	42.3	45.6	46.9	45.2	46.0	43.5	43.7
LFS 2007a	44.8	41.3	41.2	42.7	45.8	43.0	45.3	45.6	44.1	43.9
LFS 2007b	43.8	41.3	40.6	41.7	45.5	44.0	44.4	45.5	42.7	43.1
QLFS 2008Q1	44.0	42.1	40.4	42.5	46.3	42.9	44.8	45.4	43.8	43.6
QLFS 2008Q2	43.7	41.5	40.4	42.4	45.9	46.2	44.0	45.0	43.4	43.3
QLFS 2008Q3	44.2	41.9	40.4	42.1	45.9	45.2	44.3	45.3	42.9	43.3
QLFS 2008Q4	43.8	41.9	40.0	42.4	45.6	44.4	44.1	44.9	43.1	43.1
QLFS 2009Q1	43.7	41.6	40.3	42.6	45.8	46.4	44.0	44.7	42.9	43.1
QLFS 2009Q2	43.4	41.1	39.9	41.9	45.7	44.3	44.0	44.4	42.5	42.8
QLFS 2009Q3	43.6	41.8	39.9	42.0	45.9	47.1	43.5	44.4	42.5	42.8
QLFS 2009Q4	44.0	41.8	40.1	41.8	46.7	45.3	44.1	45.0	42.4	43.1
QLFS 2010Q1	43.6	41.5	40.1	42.0	46.1	44.1	43.7	44.7	42.2	42.9
QLFS 2010Q2	43.3	41.4	40.7	41.5	45.6	43.3	43.8	44.5	42.1	42.8
QLFS 2010Q3	43.1	41.1	40.2	42.1	46.0	46.2	43.9	44.6	41.8	42.9
QLFS 2010Q4	42.8	41.5	40.1	42.2	45.7	42.0	43.9	44.8	42.0	42.8
QLFS 2011Q1	43.0	41.7	40.3	42.2	45.9	43.1	43.9	44.5	42.1	42.9
QLFS 2011Q2	42.7	42.1	40.0	42.3	46.0	39.2	44.0	44.3	41.5	42.8
QLFS 2011Q3	43.5	41.7	40.4	42.3	45.6	34.9	44.2	44.5	41.5	42.9
QLFS 2011Q4	43.3	41.7	40.7	42.2	46.0	36.7	44.1	44.5	41.7	42.9

Source: Own calculations using OHS/LFS/QLFS data.

Highly-skilled –   A: Legislators, senior officials and managers
                      B: Professionals
                      C: Technicians and associate professionals
Semi-skilled –   D: Clerks
                      E: Service workers and shop and market sales
                      F: Skilled agricultural and fishery worker
                      G: Craft and related trade workers
                      H: Plant and machinery operators and assemblers
Unskilled –   I: Elementary occupations

Table 5: Mean usual weekly hours worked of formal sector employees by broad industry category, 1997-2011

	Primary	Secondary			Tertiary				All
	[A]	[B]	[C]	[D]	[E]	[F]	[G]	[H]	
OHS 1997	47.0	44.2	43.9	44.4	43.8	43.9	43.4	40.9	43.3
OHS 1998	48.5	44.2	44.1	44.5	43.4	44.5	43.3	41.4	43.5
OHS 1999	48.0	44.4	44.1	45.0	44.2	44.4	44.0	40.9	43.6
LFS 2000a	49.2	46.2	45.9	46.7	44.7	45.2	44.5	42.2	44.8
LFS 2000b	48.4	45.2	44.8	45.7	44.3	44.8	44.0	41.9	44.2
LFS 2001a	48.7	45.3	44.7	46.9	45.4	45.8	44.3	42.1	44.7
LFS 2001b	47.6	45.5	45.1	45.2	44.7	44.4	44.3	41.8	44.3
LFS 2002a	48.1	45.0	44.9	46.2	45.0	44.5	44.0	41.7	44.2
LFS 2002b	48.3	45.2	44.6	47.0	45.3	45.4	44.8	42.5	44.7
LFS 2003a	48.2	44.2	43.0	46.2	44.6	44.7	43.6	41.9	44.0
LFS 2003b	47.6	44.1	42.9	44.9	44.2	45.0	44.2	41.5	43.8
LFS 2004a	47.7	44.9	43.3	45.7	45.0	46.0	44.3	41.4	44.2
LFS 2004b	46.2	44.5	42.9	45.6	44.7	44.8	44.5	41.6	43.9
LFS 2005a	47.2	44.6	44.8	45.9	45.1	45.9	44.6	41.1	44.1
LFS 2005b	48.2	45.3	46.3	45.0	45.7	45.6	45.3	41.9	44.7
LFS 2006a	46.7	44.5	43.6	45.1	44.6	44.2	43.8	41.1	43.7
LFS 2006b	45.8	44.3	42.8	44.7	45.0	45.2	44.7	40.8	43.7
LFS 2007a	46.7	44.4	42.6	45.3	45.0	44.1	44.7	41.3	43.9
LFS 2007b	45.9	43.9	42.5	43.8	44.0	43.9	43.9	40.7	43.1
QLFS 2008Q1	46.4	44.0	42.0	44.3	45.3	44.5	43.9	41.0	43.6
QLFS 2008Q2	46.2	43.4	43.2	44.4	44.7	44.3	43.8	40.7	43.3
QLFS 2008Q3	45.8	43.9	42.3	43.8	45.1	44.2	43.7	40.5	43.3
QLFS 2008Q4	45.8	43.3	42.3	44.0	45.2	43.9	43.6	40.3	43.1
QLFS 2009Q1	45.4	43.3	42.6	43.5	45.2	43.9	43.8	40.4	43.1
QLFS 2009Q2	46.1	42.9	42.4	43.0	44.8	43.5	43.2	40.2	42.8
QLFS 2009Q3	45.7	42.9	42.8	43.0	45.0	43.8	43.4	40.3	42.8
QLFS 2009Q4	46.3	43.3	43.0	42.7	45.2	43.9	43.9	40.4	43.1
QLFS 2010Q1	45.7	43.0	43.5	42.2	45.0	43.3	44.0	40.4	42.9
QLFS 2010Q2	45.8	43.1	42.8	42.2	44.4	43.5	43.6	40.5	42.8
QLFS 2010Q3	46.3	43.2	42.1	41.6	44.7	43.4	43.5	40.7	42.9
QLFS 2010Q4	46.8	43.2	42.7	42.5	44.7	44.0	43.5	40.3	42.8
QLFS 2011Q1	45.7	43.4	42.9	41.9	44.9	44.2	43.5	40.6	42.9
QLFS 2011Q2	45.2	43.4	42.6	42.5	44.6	44.4	43.4	40.3	42.8
QLFS 2011Q3	45.0	43.2	43.3	42.9	44.8	44.1	43.1	40.6	42.9
QLFS 2011Q4	45.3	43.3	42.6	42.2	44.7	43.6	43.7	40.8	42.9

Source: Own calculations using OHS/LFS/QLFS data.

Primary –   A: Mining and quarrying
Secondary –   B: Manufacturing
                      C: Electricity, gas and water supply
                      D: Construction
Tertiary –   E: Wholesale and retail
                      F: Transport, storage and communication
                      G: Financial, insurance and business services
                      H: Community, social and personal services

Figure 1: Proportion of formal sector employees usually working 1-40 hours, 1-45 hours and 40 hours per week, 1997-2011
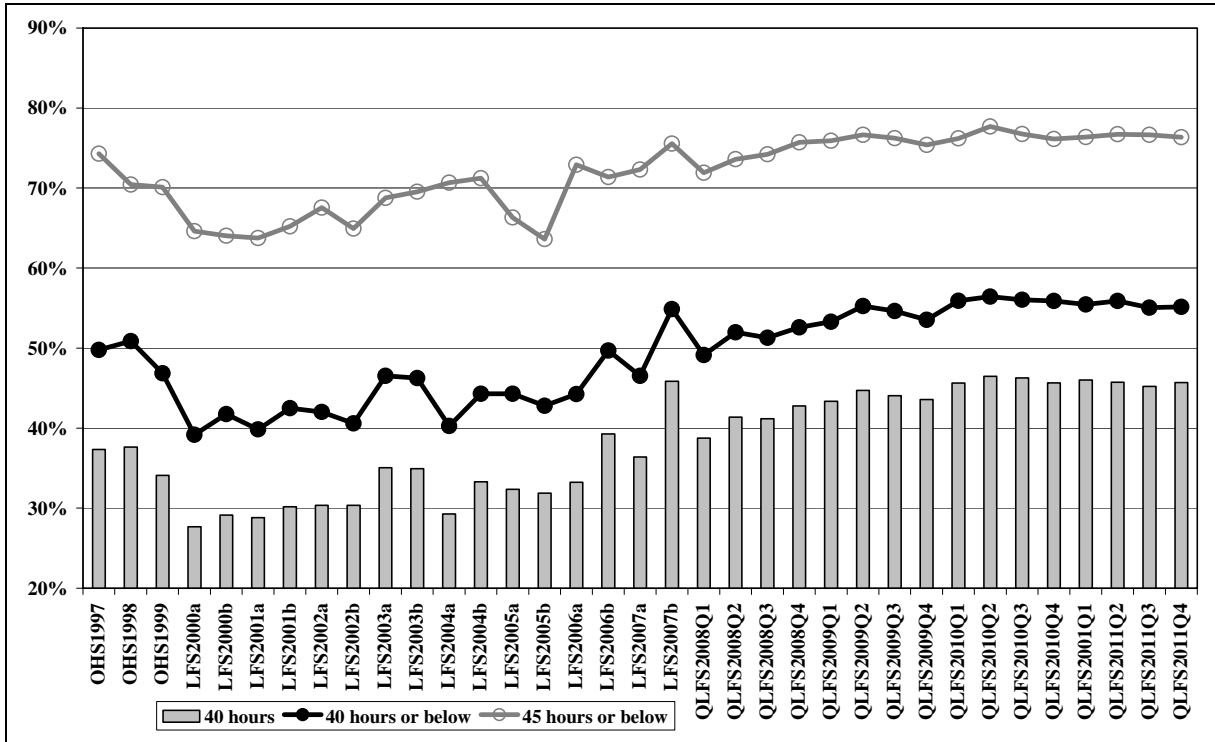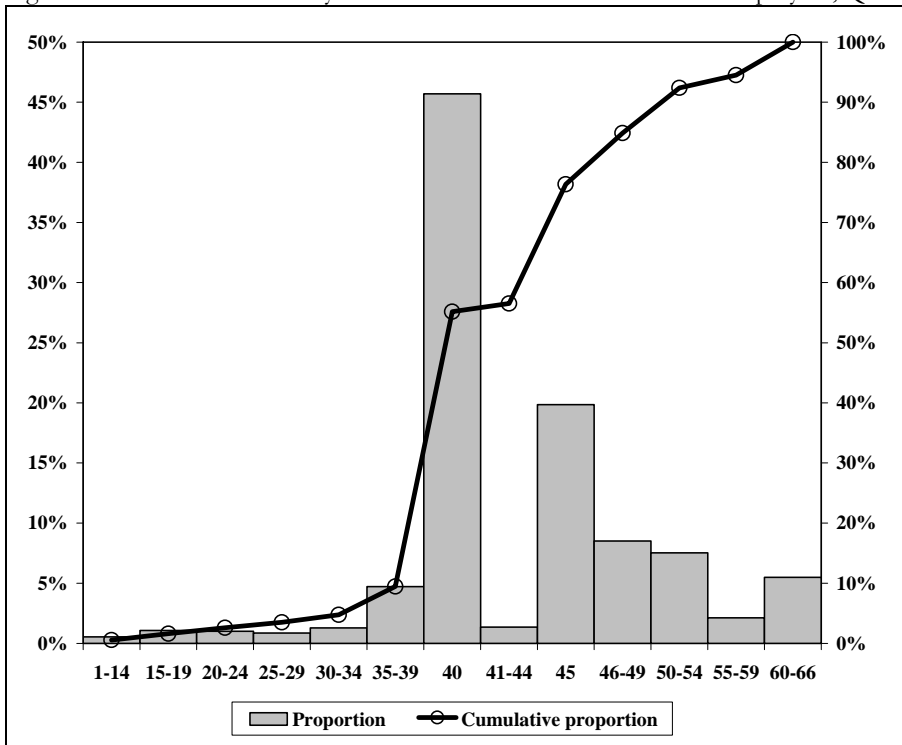

Source: Own calculations using OHS/LFS/QLFS data.

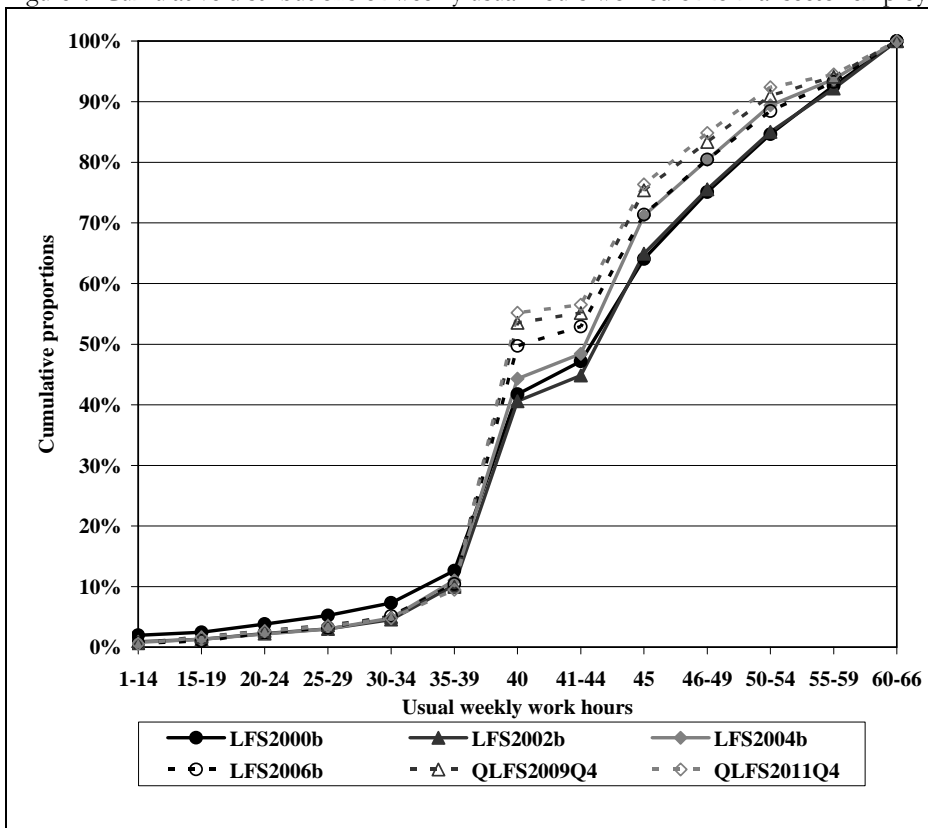Figure 2: Number and growth in formal sector employment, 1997-2011
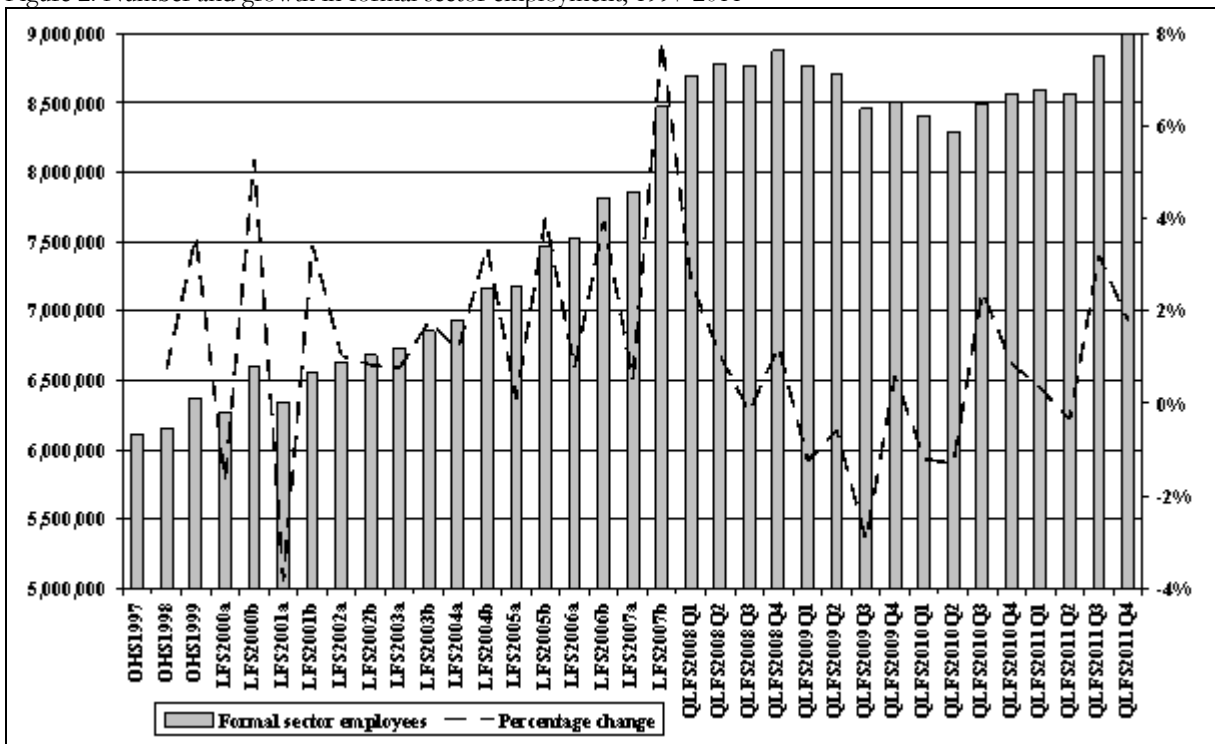
Source: Own calculations using OHS/LFS/QLFS data.

Figure 3: Distribution of weekly usual hours worked of formal sector employees, QLFS 2011Q4
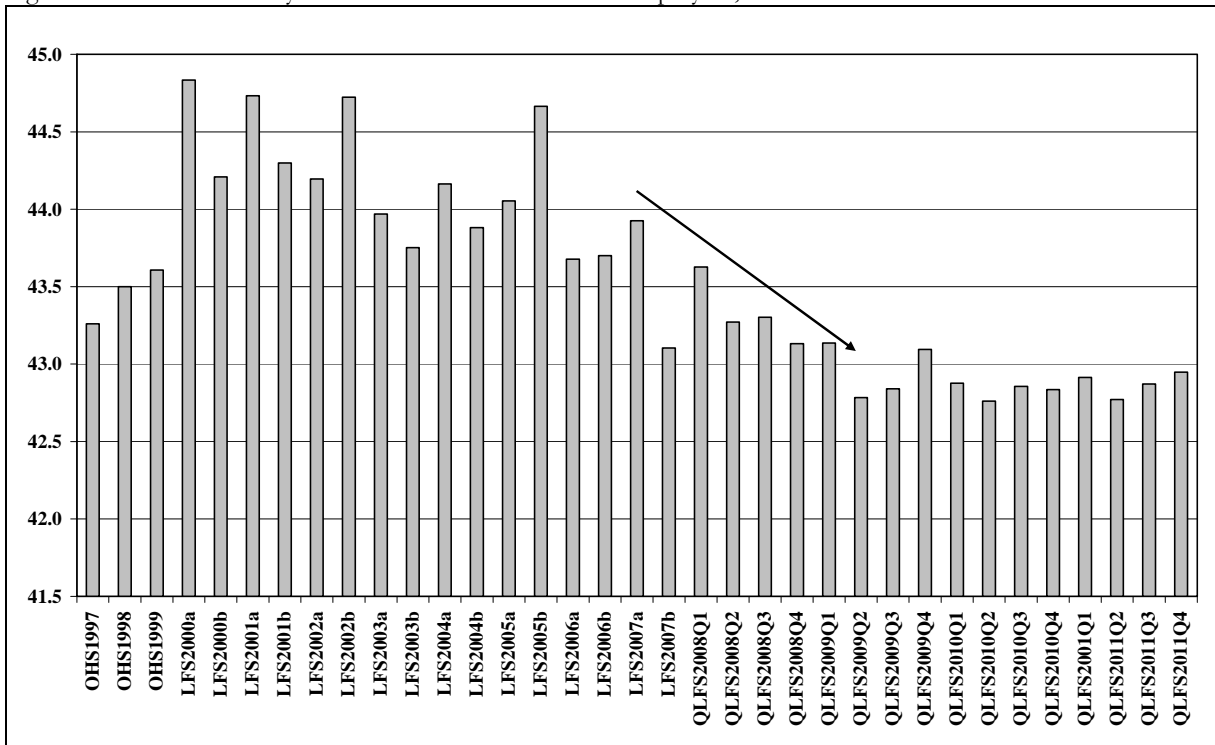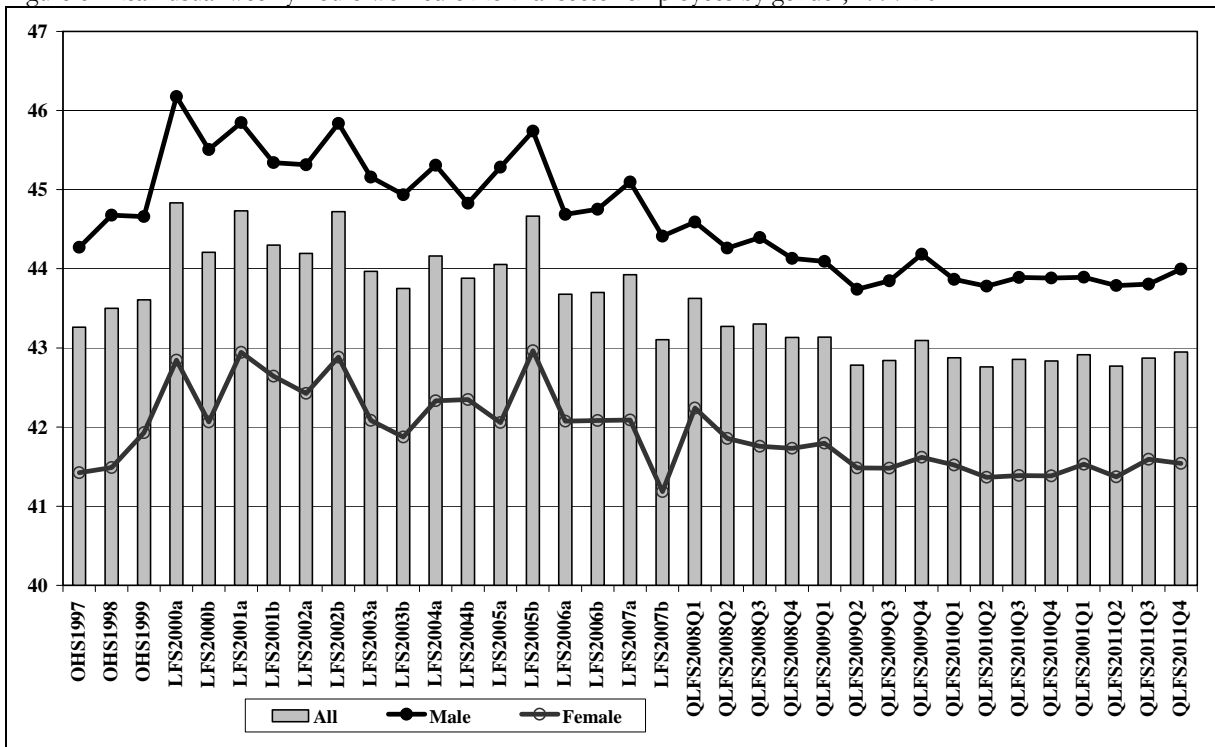

Source: Own calculations using QLFS Q4 data.

Figure 4: Cumulative distributions of weekly usual hours worked of formal sector employees, selected surveys

Source: Own calculations using selected LFS and QLFS data.
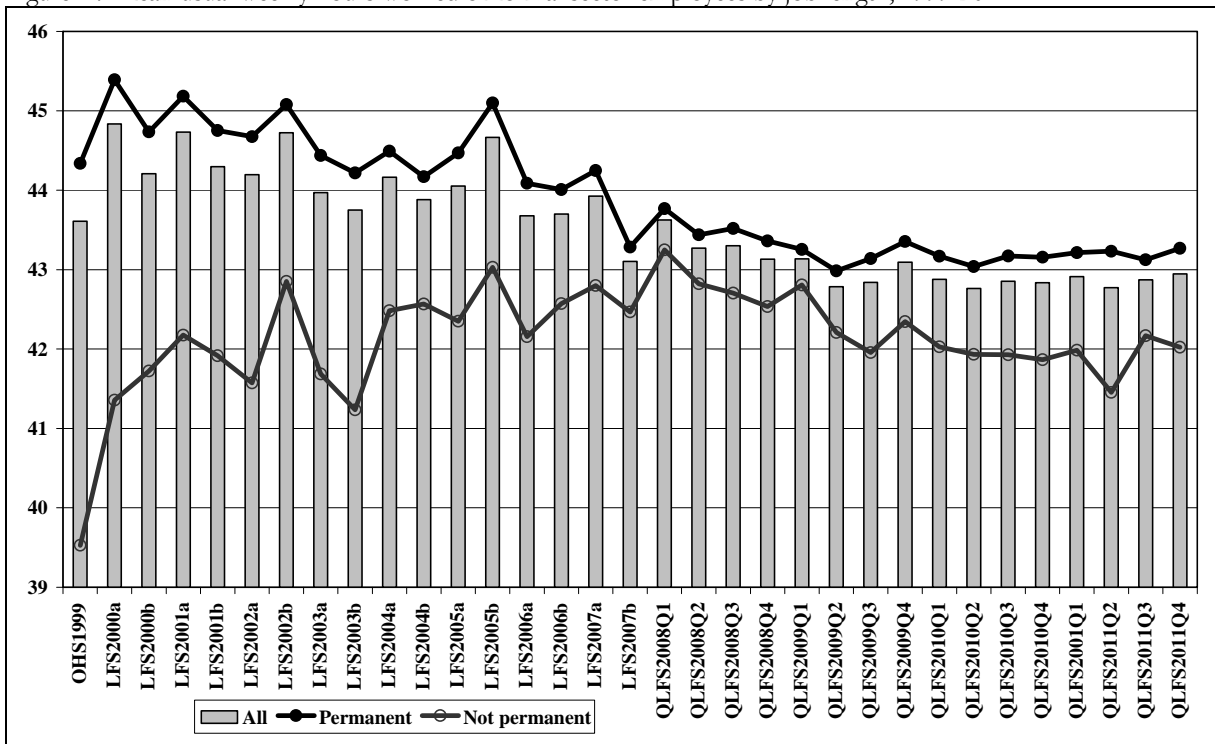
Figure 5: Mean usual weekly hours worked of formal sector employees, 1997-2011
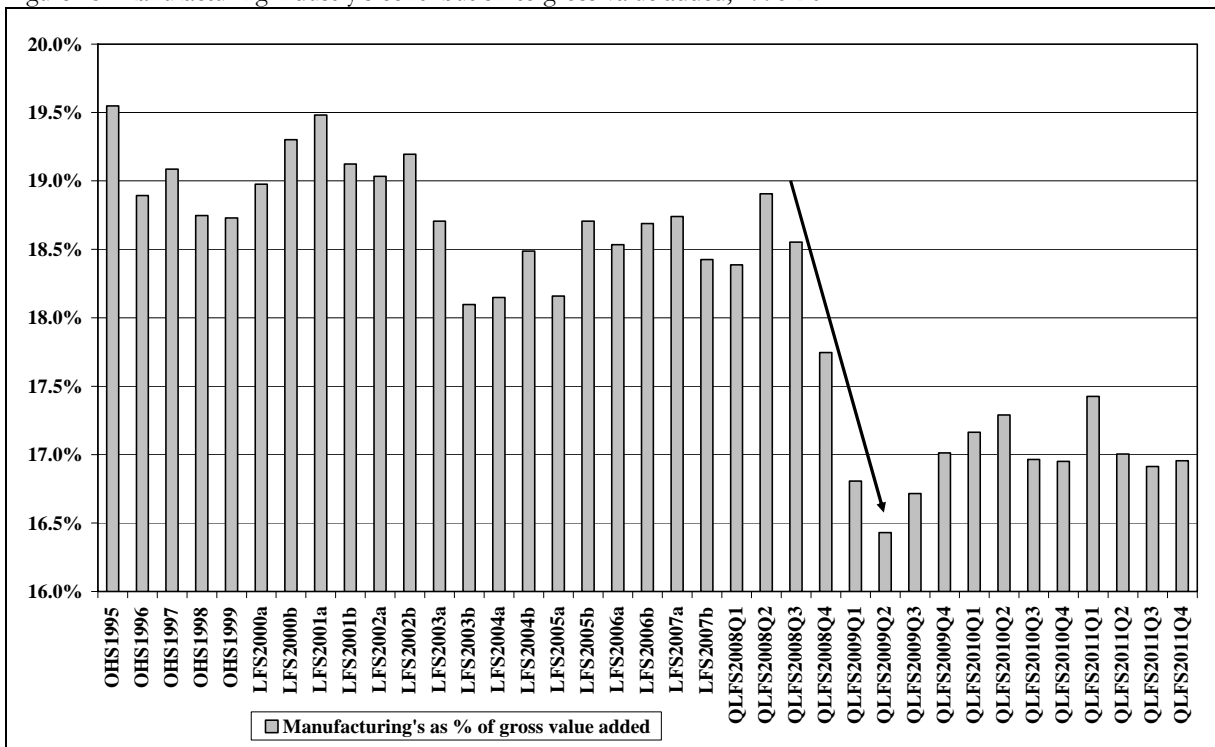

Source: Own calculations using OHS/LFS/QLFS data.

Figure 6: Mean usual weekly hours worked of formal sector employees by gender, 1997-2011

Source: Own calculations using OHS/LFS/QLFS data.

Figure 7: Mean usual weekly hours worked of formal sector employees by race, 1997-2011
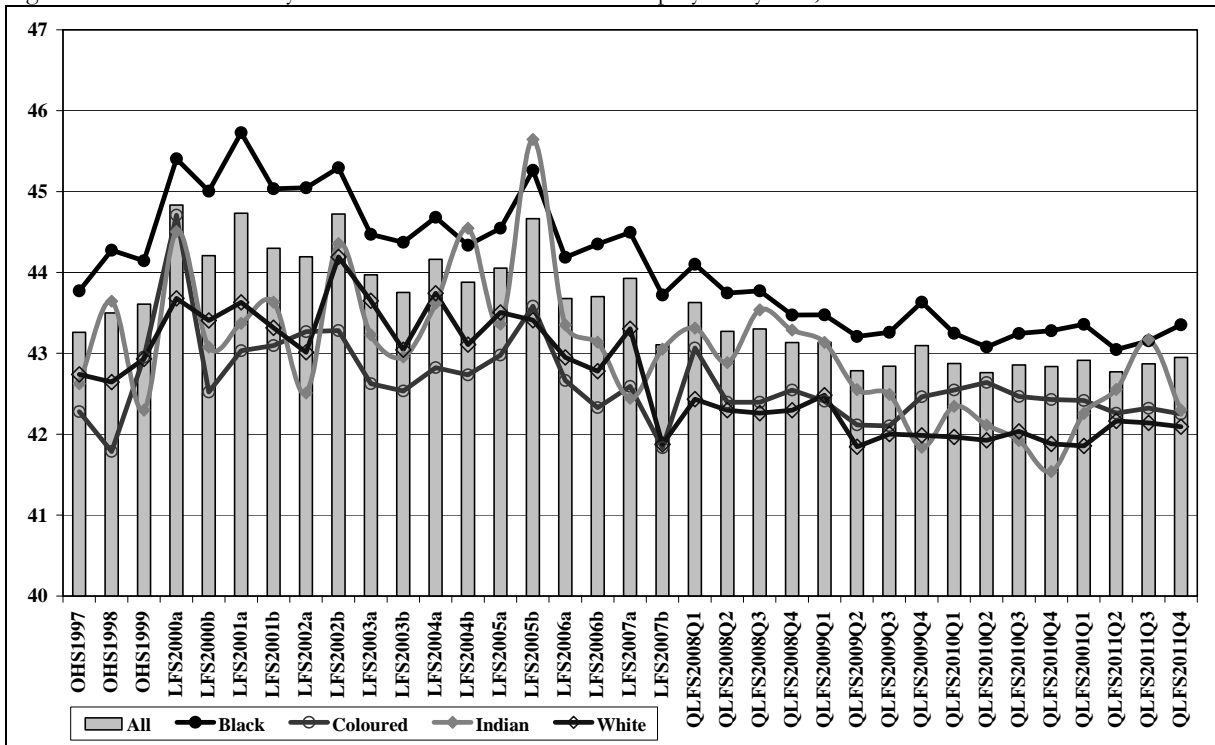
Source: Own calculations using OHS/LFS/QLFS data.

Figure 8: Mean usual weekly hours worked of formal sector employees by gender and race, 1997-2011
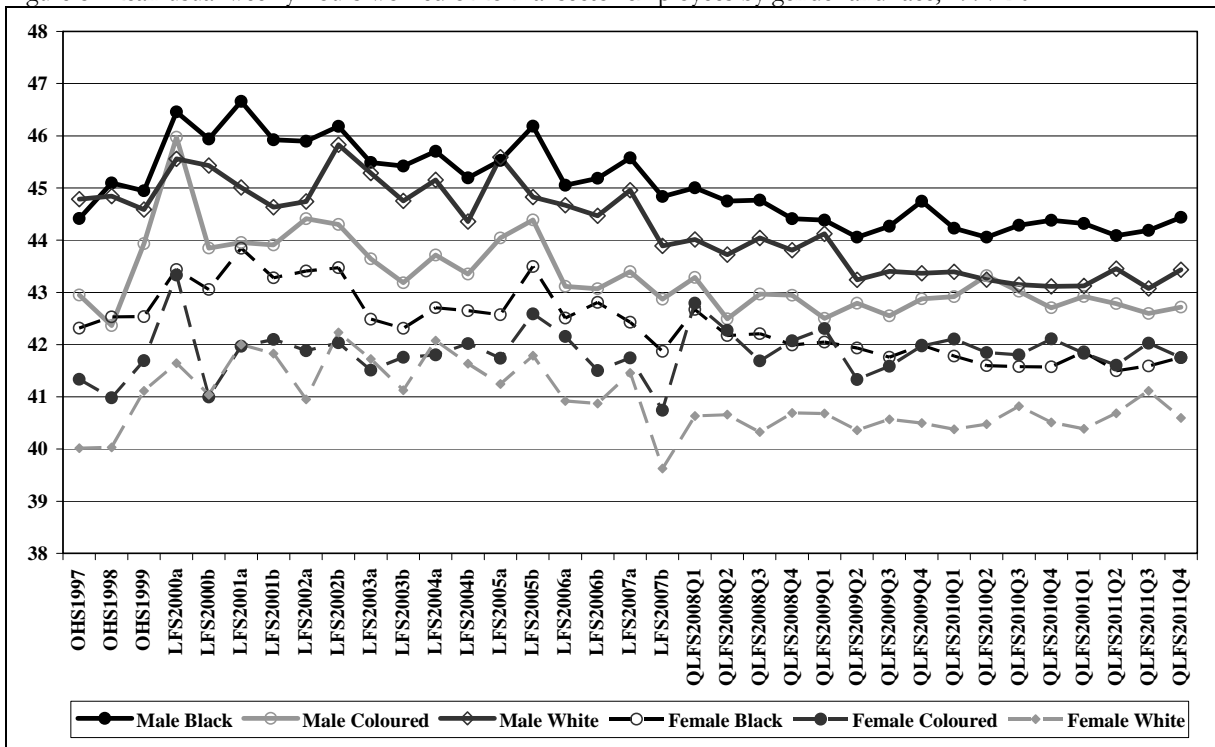
Source: Own calculations using OHS/LFS/QLFS data. Indians are excluded for presentation purposes.

Figure 9: Mean usual weekly hours worked of formal sector employees by age category, 1997-2011
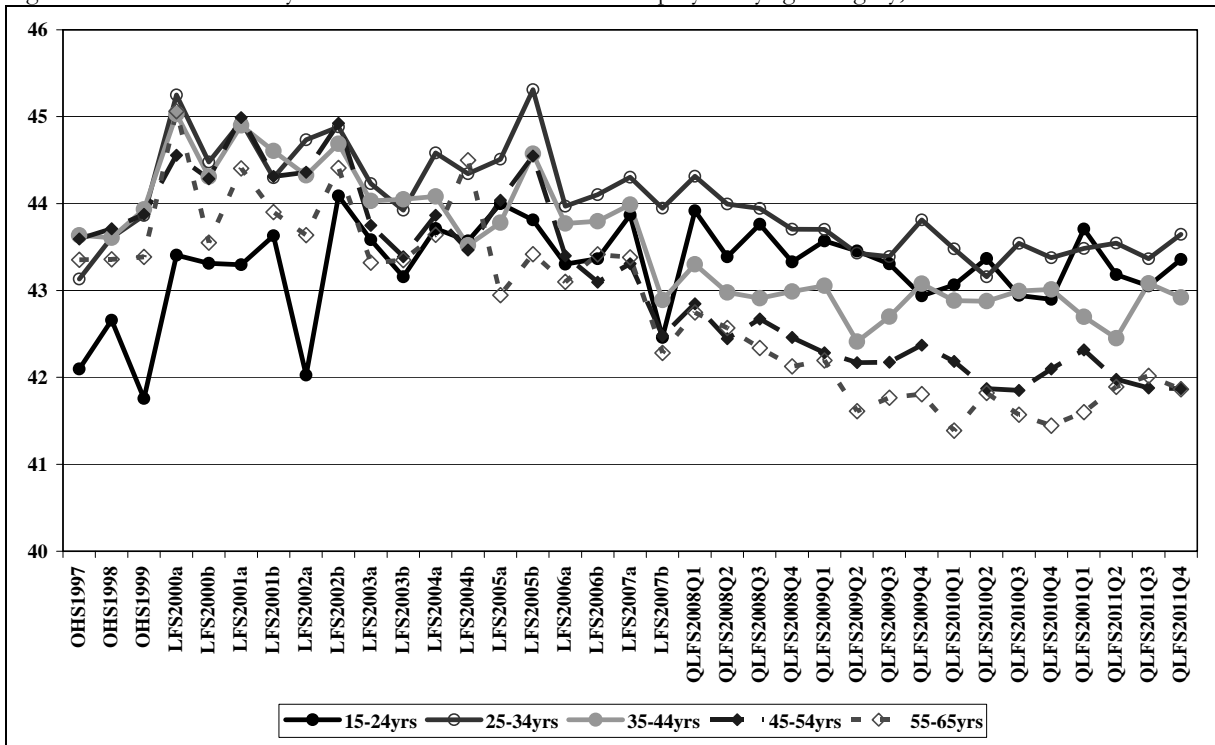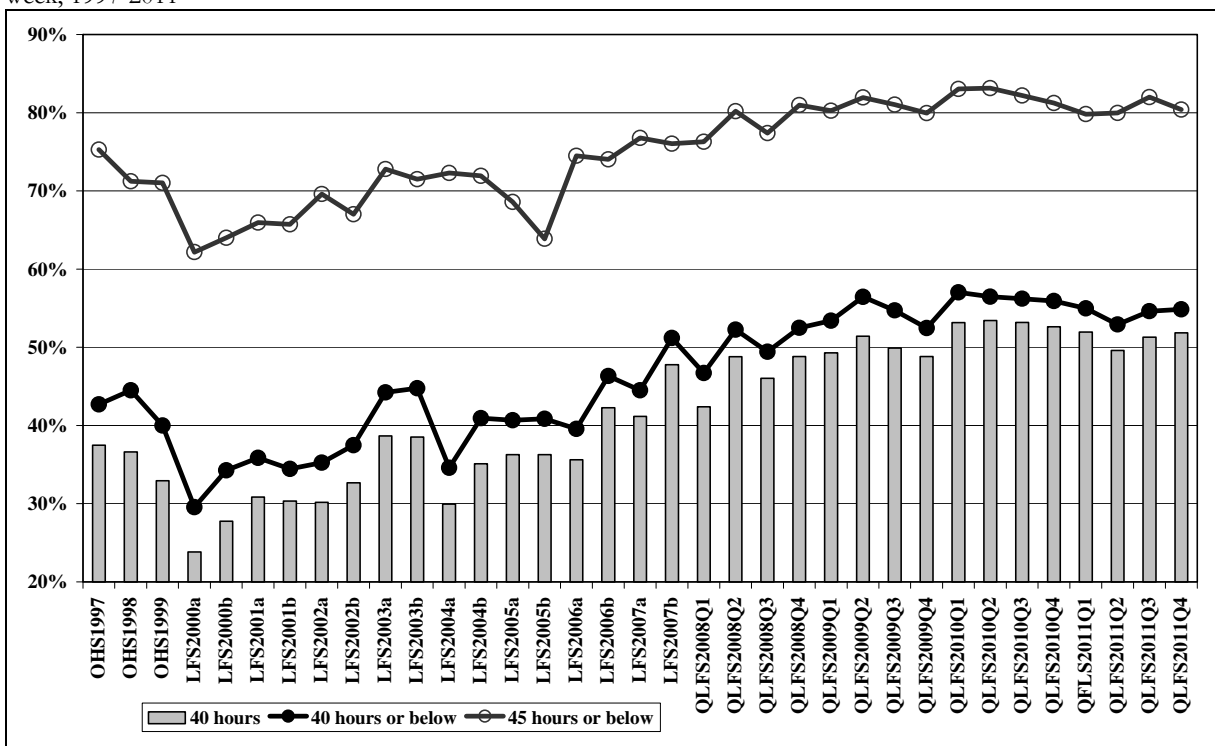

Source: Own calculations using OHS/LFS/QLFS data.

Figure 10: Mean usual weekly hours worked of formal sector employees by highest educational attainment, selected surveys
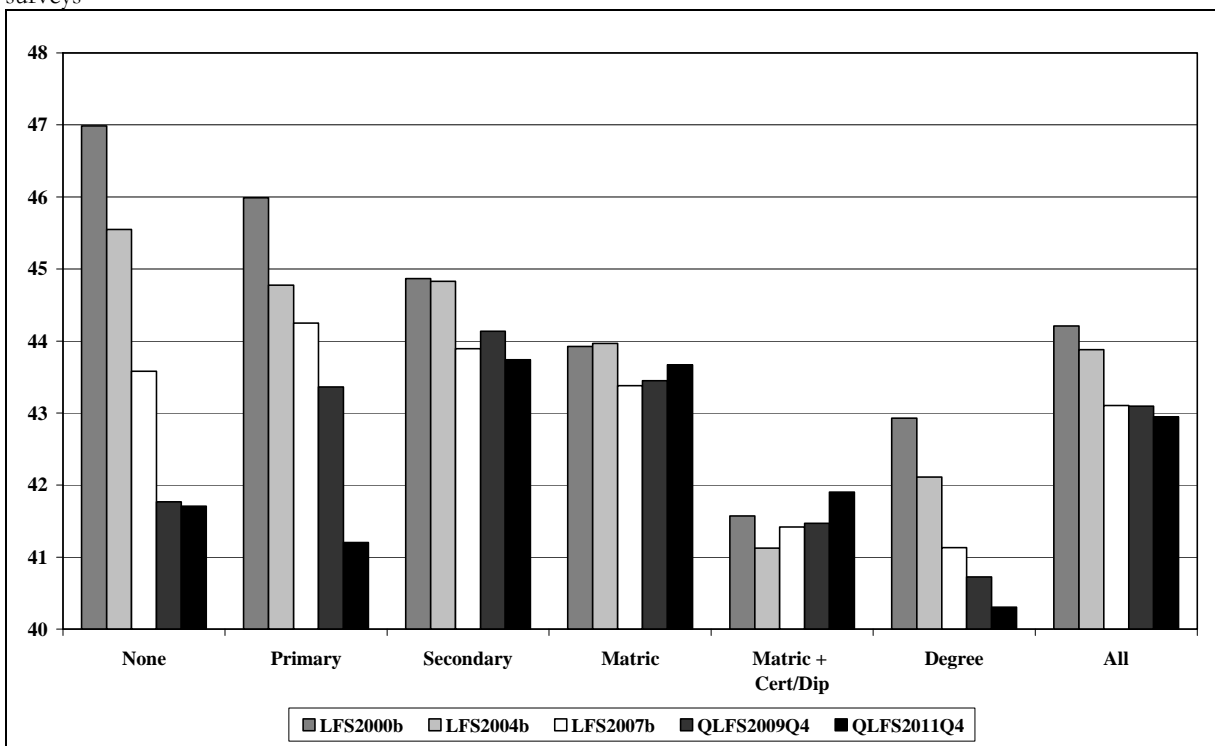
Source: Own calculations using LFS/QLFS data.

Figure 11: Mean usual weekly hours worked of formal sector employees by trade union membership status, 1997-2007, 2010-2011
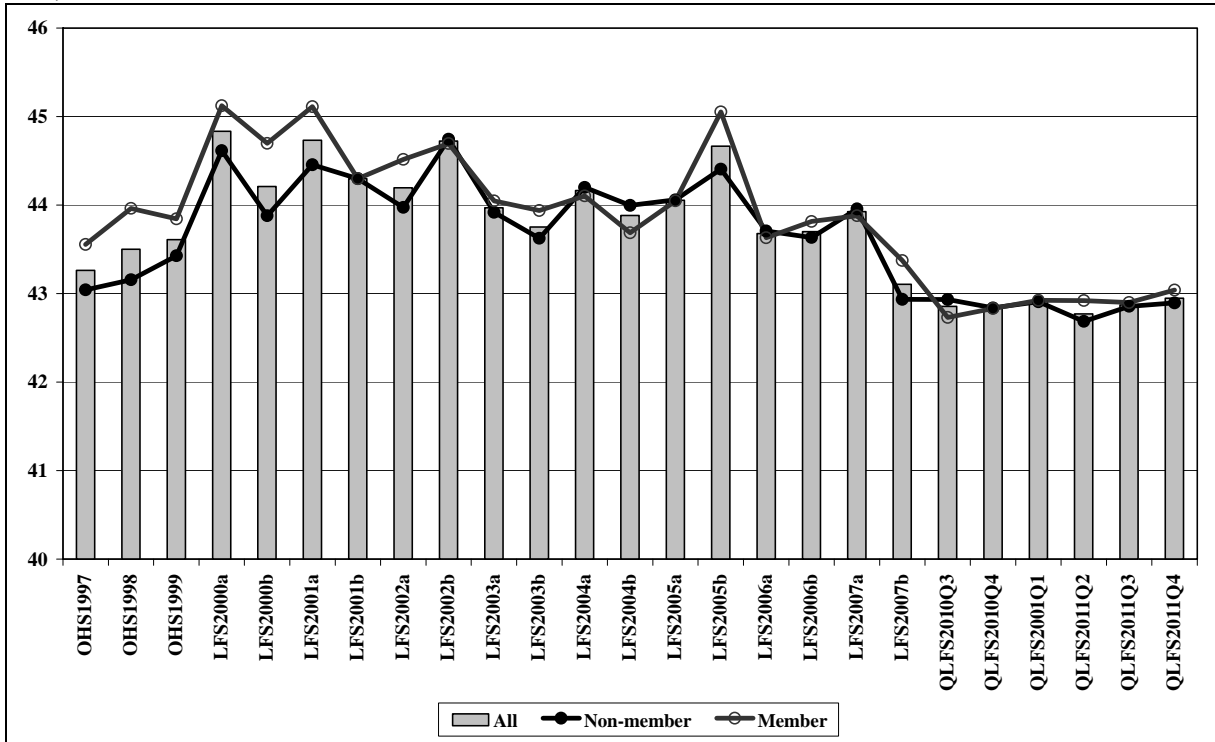
Source: Own calculations using OHS/LFS/QLFS data.
Note: The trade union membership status question was not asked in QLFS 2008Q1-QLFS 2010Q2.

Figure 12: Mean usual weekly hours worked of formal sector employees by public/private sector status, 1997-2011
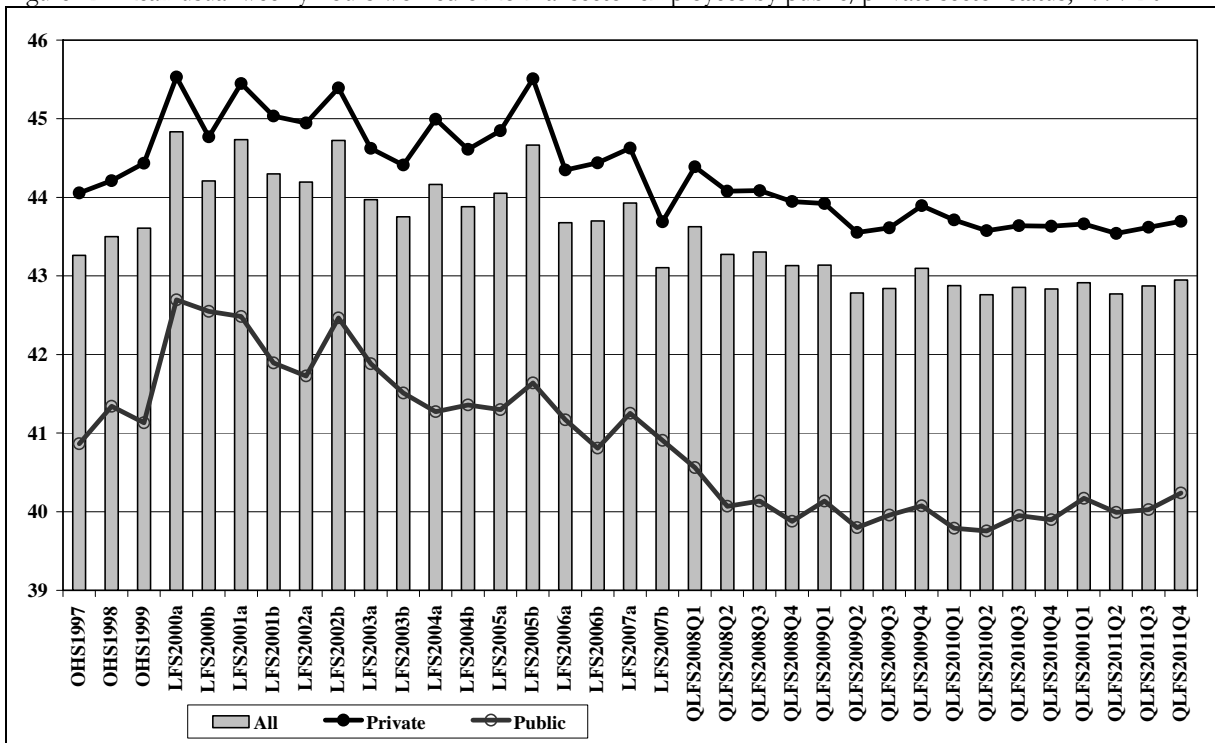
Source: Own calculations using OHS/LFS/QLFS data.

Figure 13: Mean usual weekly hours worked of formal sector employees by skills level of occupations, 1997-2011
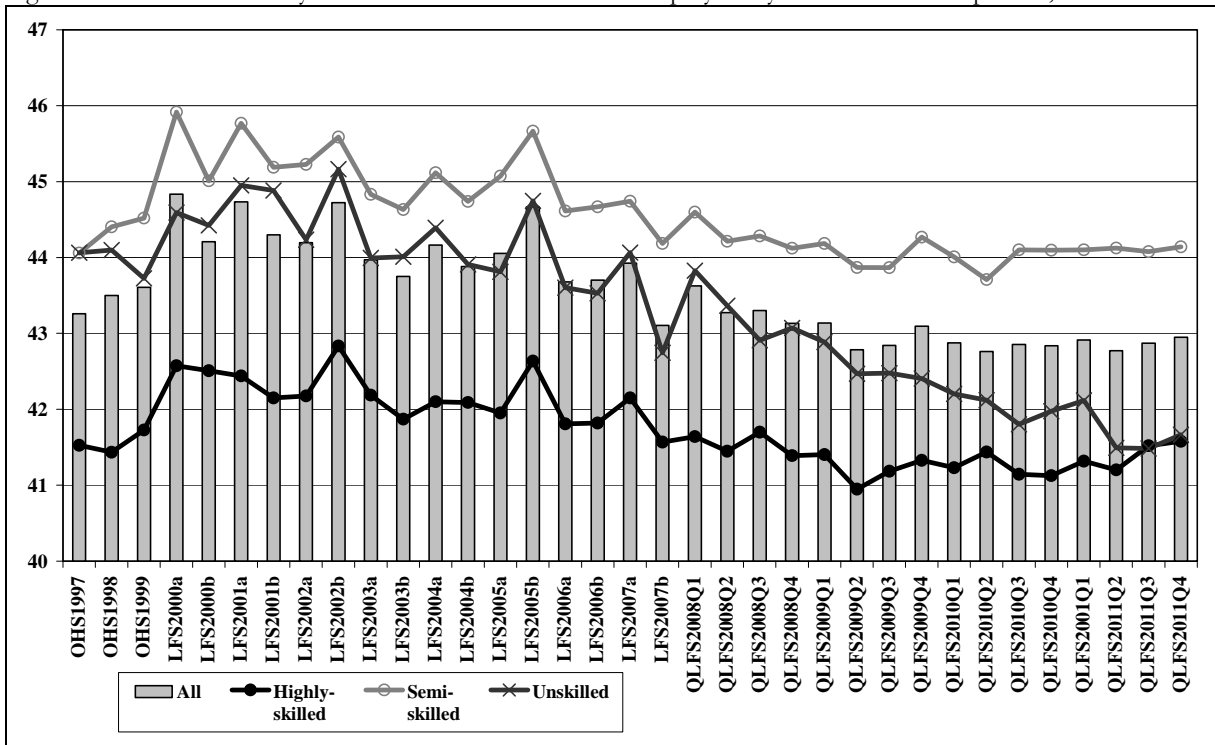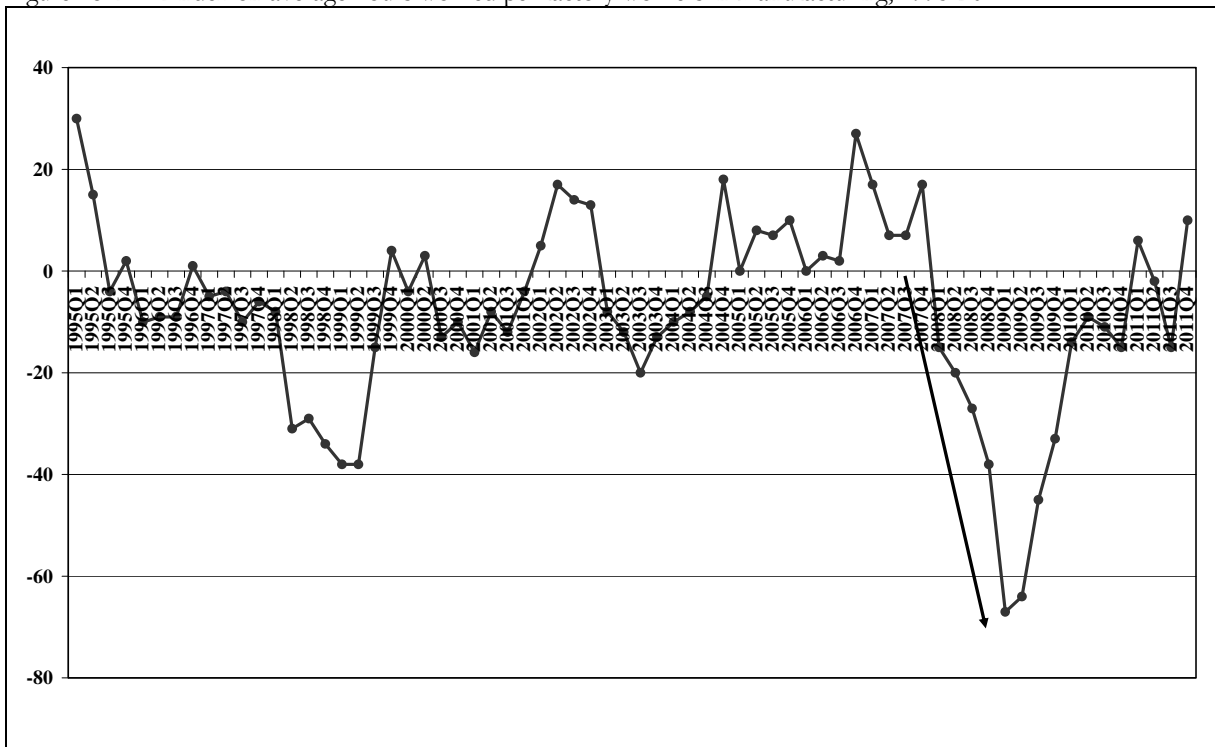

Source: Own calculations using OHS/LFS/QLFS data.

Figure 14: Mean usual weekly hours worked of formal sector employees by job length, 1999-2011

Source: Own calculations using OHS/LFS/QLFS data.
Note: The question on job length was only asked since OHS 1999.

Figure 15: Manufacturing industry's contribution to gross value added, 1995-2011

Source: Own calculations using South African Reserve Bank Bulletin data.

Figure 16: Proportion of formal manufacturing employees usually working 1-40 hours, 1-45 hours and 40 hours per week, 1997-2011

Source: Own calculations using OHS/LFS/QLFS data.

Figure 17: Mean usual weekly hours worked of formal manufacturing employees, 1997-2011
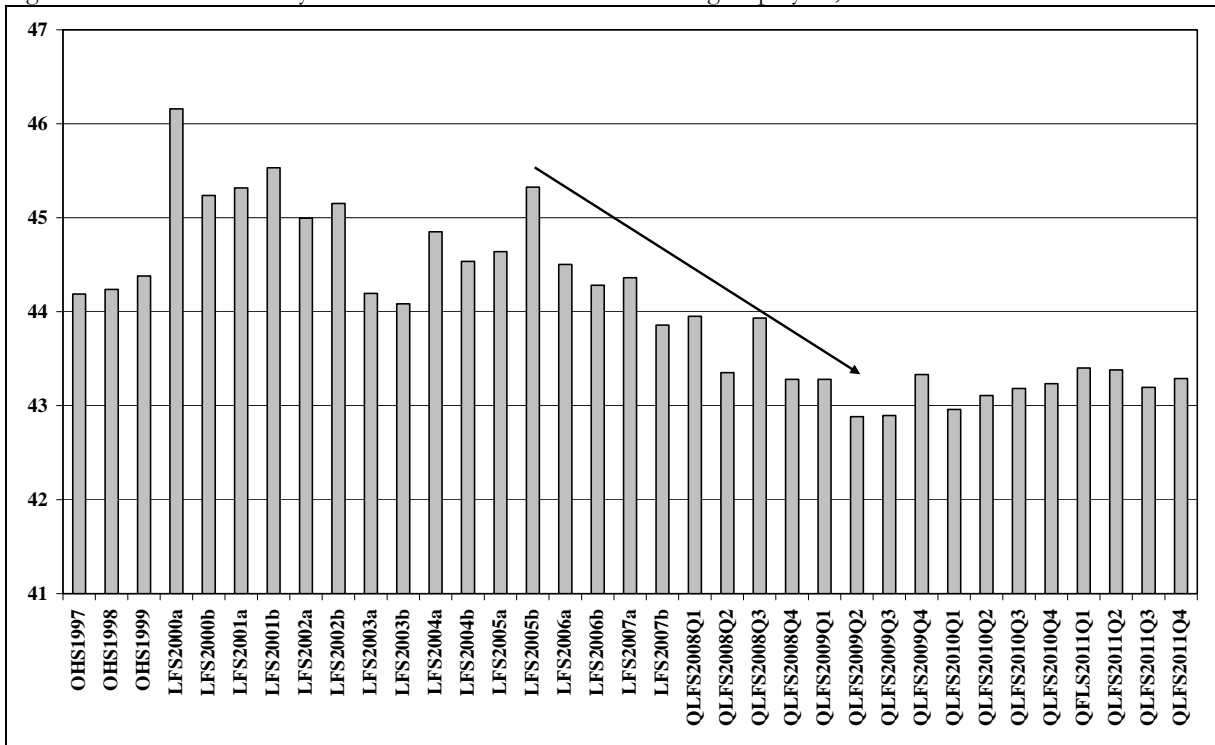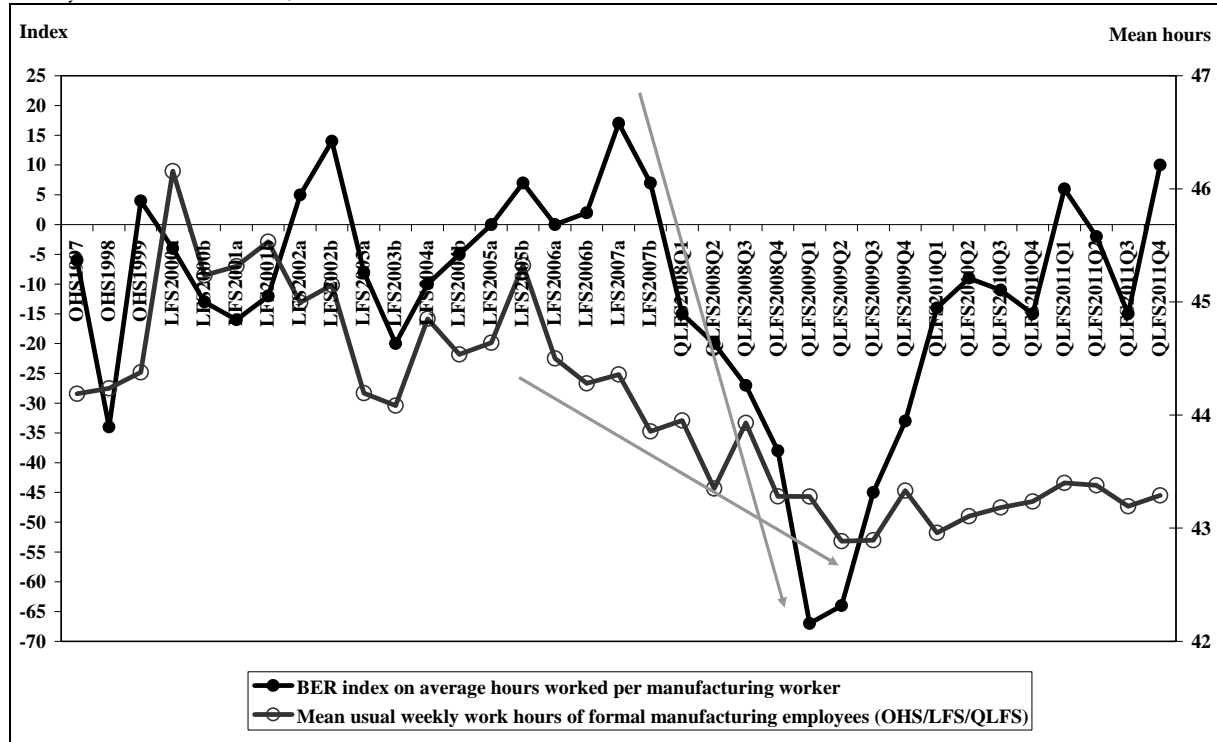

Source: Own calculations using OHS/LFS/QLFS data.

Figure 18: BER index on average hours worked per factory workers in manufacturing, 1995-2011
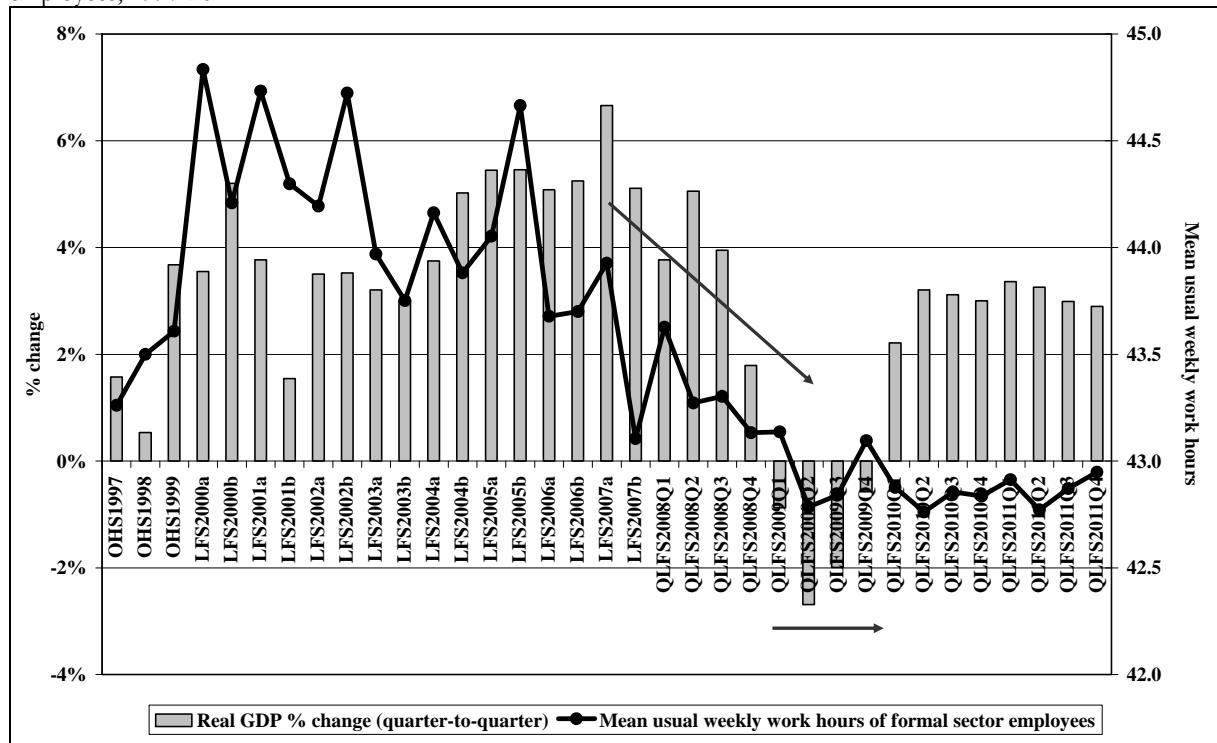

Data source: Bureau of Economic Research.

Figure 19: BER index on average hours worked per factory workers in manufacturing vs. OHS/LFS/QLFS mean weekly usual hours worked, 1997-2011
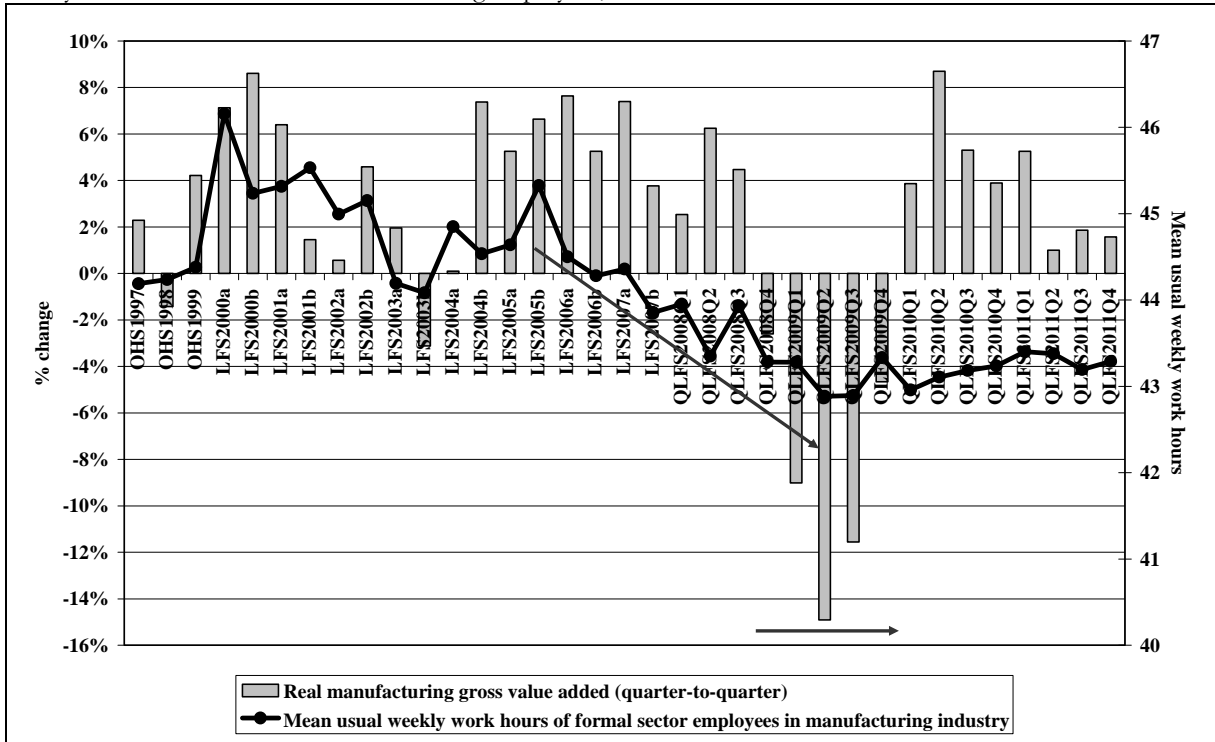

Source: Own calculations using OHS/LFS/QLFS and BER data.

Figure 20: Real GDP quarter-to-quarter percentage change vs. Mean usual weekly hours worked of formal sector employees, 1997-2011
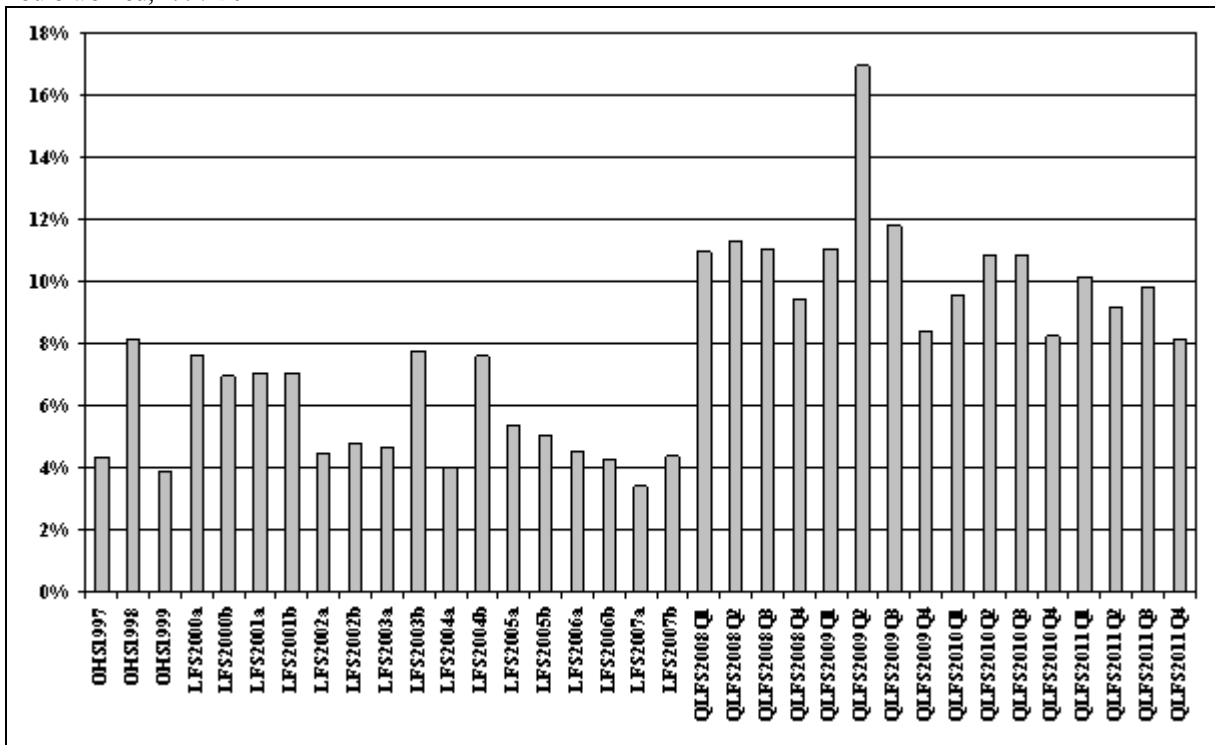

Source: Own calculations using the South African Reserve Bank Bulletin data and OHS/LFS/QLFS data.

Figure 21: Real gross value added of manufacturing industry quarter-to-quarter percentage change vs. mean usual weekly hours worked of formal manufacturing employees, 1997-2011
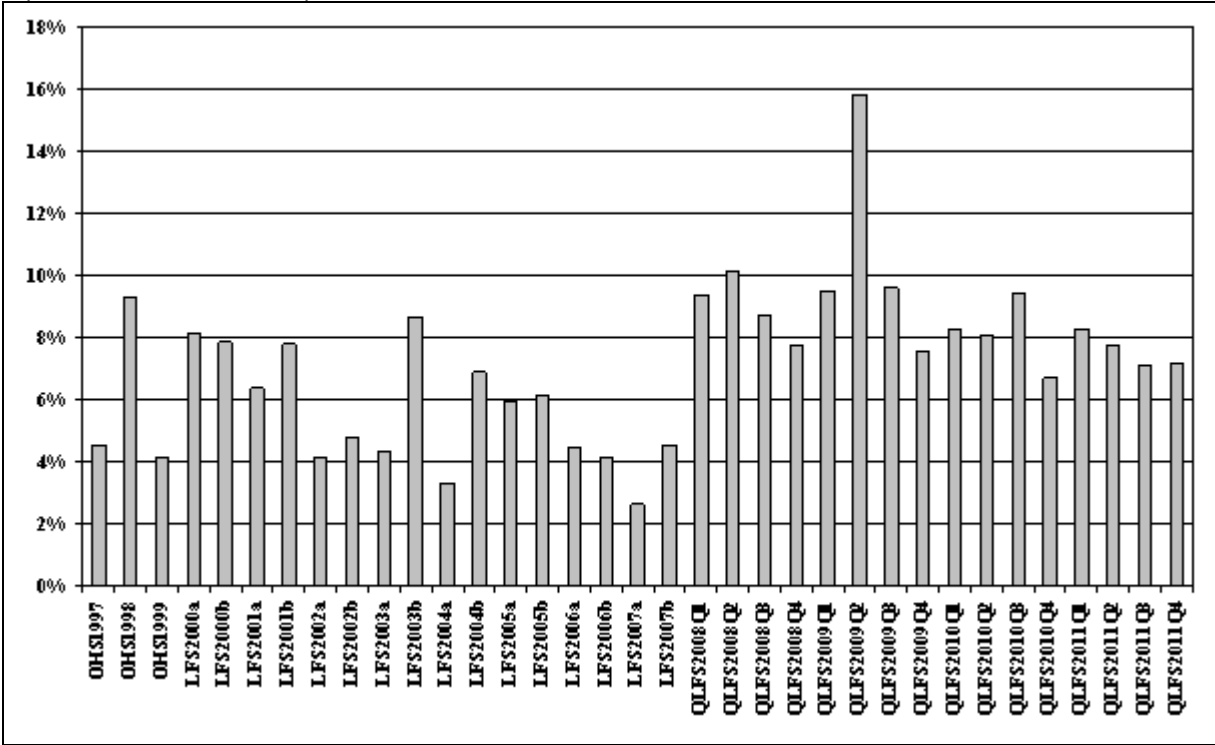

Source: Own calculations using the South African Reserve Bank Bulletin data and OHS/LFS/QLFS data.

Figure 22: Proportion of formal sector employees with hours worked in the last seven days smaller than usual weekly hours worked, 1997-2011

Source: Own calculations using OHS/LFS/QLFS data.

Figure 23: Proportion of formal sector employees in manufacturing industry with hours worked in the last seven days smaller than usual weekly hours worked, 1997-2011
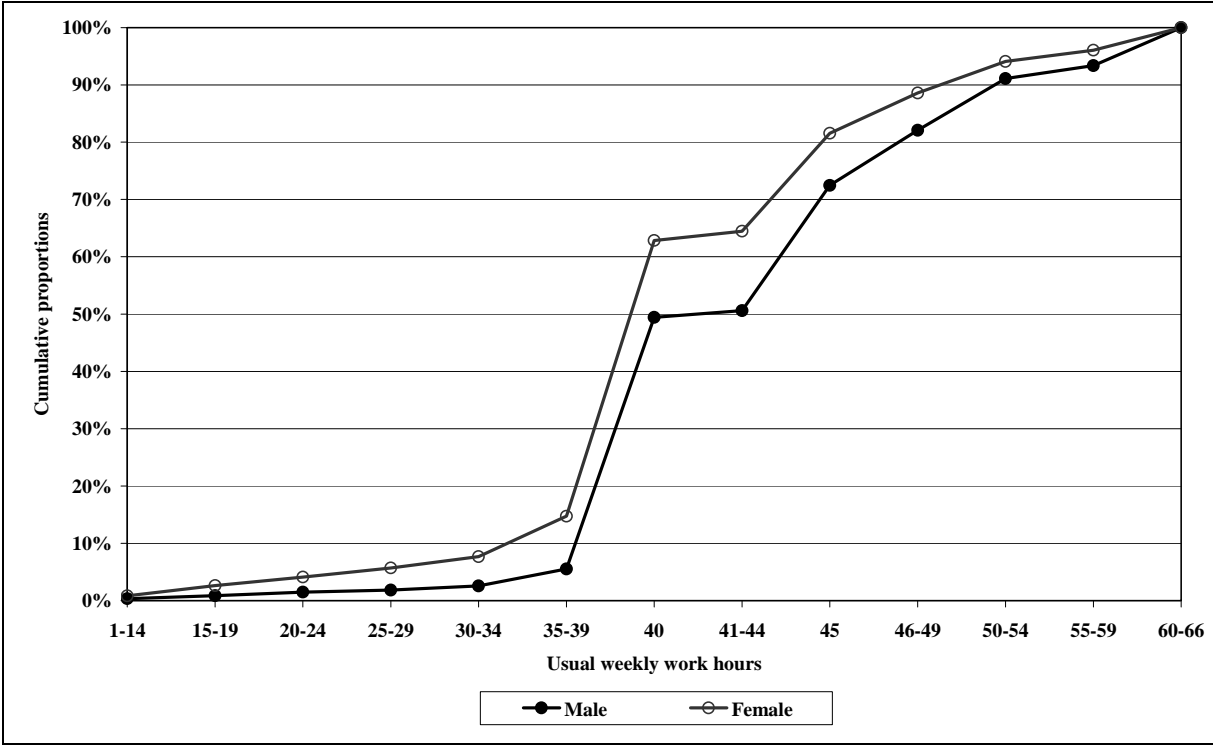

Source: Own calculations using OHS/LFS/QLFS data.

Table A.1: Number of observations falling in each usual weekly hours worked category, 1997 – 2011

| period	0 hour	1-39 hours	40 hours	41-44 hours	45 hours	46-54 hours	55-66 hours	66-168 hours	Not specified	All	0 hour	1-39 hours	40 hours	41-44 hours	45 hours	46-54 hours	55-66 hours	66-168 hours	Not specified	All
OHS 1997	8	2,048	5,480	705	3,120	2,417	1,883	956	157	16,774	0.0%	12.2%	32.7%	4.2%	18.6%	14.4%	11.2%	5.7%	0.9%	100.0%
OHS 1998	0	1,346	3,558	440	1,615	1,722	1,448	618	162	10,909	0.0%	12.3%	32.6%	4.0%	14.8%	15.8%	13.3%	5.7%	1.5%	100.0%
OHS 1999	0	1,808	4,623	592	2,653	2,326	2,020	809	88	14,919	0.0%	12.1%	31.0%	4.0%	17.8%	15.6%	13.5%	5.4%	0.6%	100.0%
LFS 2000a	4	590	1,379	299	924	964	838	340	15	5,353	0.1%	11.0%	25.8%	5.6%	17.3%	18.0%	15.7%	6.4%	0.3%	100.0%
LFS 2000b	37	1,669	3,706	655	2,238	2,677	2,121	931	139	14,173	0.3%	11.8%	26.1%	4.6%	15.8%	18.9%	15.0%	6.6%	1.0%	100.0%
LFS 2001a	9	1,518	3,719	580	2,621	2,795	2,173	969	83	14,467	0.1%	10.5%	25.7%	4.0%	18.1%	19.3%	15.0%	6.7%	0.6%	100.0%
LFS 2001b	2	1,737	3,895	558	2,569	2,874	1,934	926	56	14,551	0.0%	11.9%	26.8%	3.8%	17.7%	19.8%	13.3%	6.4%	0.4%	100.0%
LFS 2002a	1	1,768	4,288	678	2,998	2,761	2,003	835	9	15,341	0.0%	11.5%	28.0%	4.4%	19.5%	18.0%	13.1%	5.4%	0.1%	100.0%
LFS 2002b	0	1,522	3,891	575	2,685	2,688	1,997	802	18	14,178	0.0%	10.7%	27.4%	4.1%	18.9%	19.0%	14.1%	5.7%	0.1%	100.0%
LFS 2003a	0	1,662	4,623	564	2,438	2,397	1,705	663	18	14,070	0.0%	11.8%	32.9%	4.0%	17.3%	17.0%	12.1%	4.7%	0.1%	100.0%
LFS 2003b	44	1,621	4,610	567	2,412	2,641	1,620	628	11	14,154	0.3%	11.5%	32.6%	4.0%	17.0%	18.7%	11.4%	4.4%	0.1%	100.0%
LFS 2004a	7	1,579	3,983	505	3,534	2,619	1,483	578	13	14,301	0.0%	11.0%	27.9%	3.5%	24.7%	18.3%	10.4%	4.0%	0.1%	100.0%
LFS 2004b	4	1,728	4,023	475	3,255	2,334	1,423	638	23	13,903	0.0%	12.4%	28.9%	3.4%	23.4%	16.8%	10.2%	4.6%	0.2%	100.0%
LFS 2005a	1	1,727	3,785	426	2,841	2,687	1,707	816	14	14,004	0.0%	12.3%	27.0%	3.0%	20.3%	19.2%	12.2%	5.8%	0.1%	100.0%
LFS 2005b	0	1,612	3,632	439	2,451	2,644	2,002	1,192	36	14,008	0.0%	11.5%	25.9%	3.1%	17.5%	18.9%	14.3%	8.5%	0.3%	100.0%
LFS 2006a	2	1,756	3,962	371	3,662	2,315	1,433	769	21	14,291	0.0%	12.3%	27.7%	2.6%	25.6%	16.2%	10.0%	5.4%	0.1%	100.0%
LFS 2006b	3	1,639	4,957	389	2,656	2,359	1,581	772	22	14,378	0.0%	11.4%	34.5%	2.7%	18.5%	16.4%	11.0%	5.4%	0.2%	100.0%
LFS 2007a	3	1,682	4,585	400	3,276	2,224	1,747	935	34	14,886	0.0%	11.3%	30.8%	2.7%	22.0%	14.9%	11.7%	6.3%	0.2%	100.0%
LFS 2007b	0	1,552	5,953	443	2,574	2,115	1,401	645	35	14,718	0.0%	10.5%	40.4%	3.0%	17.5%	14.4%	9.5%	4.4%	0.2%	100.0%
QLFS 2008Q1	0	1,647	5,475	358	3,005	2,543	1,499	743	0	15,270	0.0%	10.8%	35.9%	2.3%	19.7%	16.7%	9.8%	4.9%	0.0%	100.0%
QLFS 2008Q2	0	1,709	5,852	298	2,923	2,467	1,354	691	0	15,294	0.0%	11.2%	38.3%	1.9%	19.1%	16.1%	8.9%	4.5%	0.0%	100.0%
QLFS 2008Q3	0	1,683	5,962	303	3,064	2,370	1,305	622	0	15,309	0.0%	11.0%	38.9%	2.0%	20.0%	15.5%	8.5%	4.1%	0.0%	100.0%
QLFS 2008Q4	0	1,646	6,203	301	3,127	2,354	1,226	607	0	15,464	0.0%	10.6%	40.1%	1.9%	20.2%	15.2%	7.9%	3.9%	0.0%	100.0%
QLFS 2009Q1	0	1,644	6,196	280	3,100	2,268	1,245	528	0	15,261	0.0%	10.8%	40.6%	1.8%	20.3%	14.9%	8.2%	3.5%	0.0%	100.0%
QLFS 2009Q2	0	1,655	6,083	231	2,762	2,162	1,088	509	0	14,490	0.0%	11.4%	42.0%	1.6%	19.1%	14.9%	7.5%	3.5%	0.0%	100.0%
QLFS 2009Q3	0	1,554	5,640	228	2,566	2,008	1,039	478	0	13,513	0.0%	11.5%	41.7%	1.7%	19.0%	14.9%	7.7%	3.5%	0.0%	100.0%
QLFS 2009Q4	0	1,474	5,601	224	2,575	2,014	1,144	460	0	13,492	0.0%	10.9%	41.5%	1.7%	19.1%	14.9%	8.5%	3.4%	0.0%	100.0%
QLFS 2010Q1	0	1,521	5,696	201	2,426	2,002	1,058	390	0	13,294	0.0%	11.4%	42.8%	1.5%	18.2%	15.1%	8.0%	2.9%	0.0%	100.0%
QLFS 2010Q2	0	1,442	5,782	211	2,490	1,824	1,037	428	0	13,214	0.0%	10.9%	43.8%	1.6%	18.8%	13.8%	7.8%	3.2%	0.0%	100.0%
QLFS 2010Q3	0	1,397	5,496	178	2,418	1,855	966	407	0	12,717	0.0%	11.0%	43.2%	1.4%	19.0%	14.6%	7.6%	3.2%	0.0%	100.0%
QLFS 2010Q4	0	1,419	5,343	189	2,229	1,930	936	406	0	12,452	0.0%	11.4%	42.9%	1.5%	17.9%	15.5%	7.5%	3.3%	0.0%	100.0%
QLFS 2011Q1	0	1,353	5,361	185	2,259	1,869	862	410	0	12,299	0.0%	11.0%	43.6%	1.5%	18.4%	15.2%	7.0%	3.3%	0.0%	100.0%
QLFS 2011Q2	0	1,431	5,398	160	2,282	1,818	819	346	0	12,254	0.0%	11.7%	44.1%	1.3%	18.6%	14.8%	6.7%	2.8%	0.0%	100.0%
QLFS 2011Q3	0	1,481	5,687	181	2,510	1,955	895	364	0	13,073	0.0%	11.3%	43.5%	1.4%	19.2%	15.0%	6.8%	2.8%	0.0%	100.0%
QLFS 2011Q4	16	1,464	5,937	189	2,482	2,113	916	438	0	13,555	0.1%	10.8%	43.8%	1.4%	18.3%	15.6%	6.8%	3.2%	0.0%	100.0%

Figure A.1: Cumulative distributions of weekly usual hours worked of formal sector employees by gender, QLFS 2011Q4
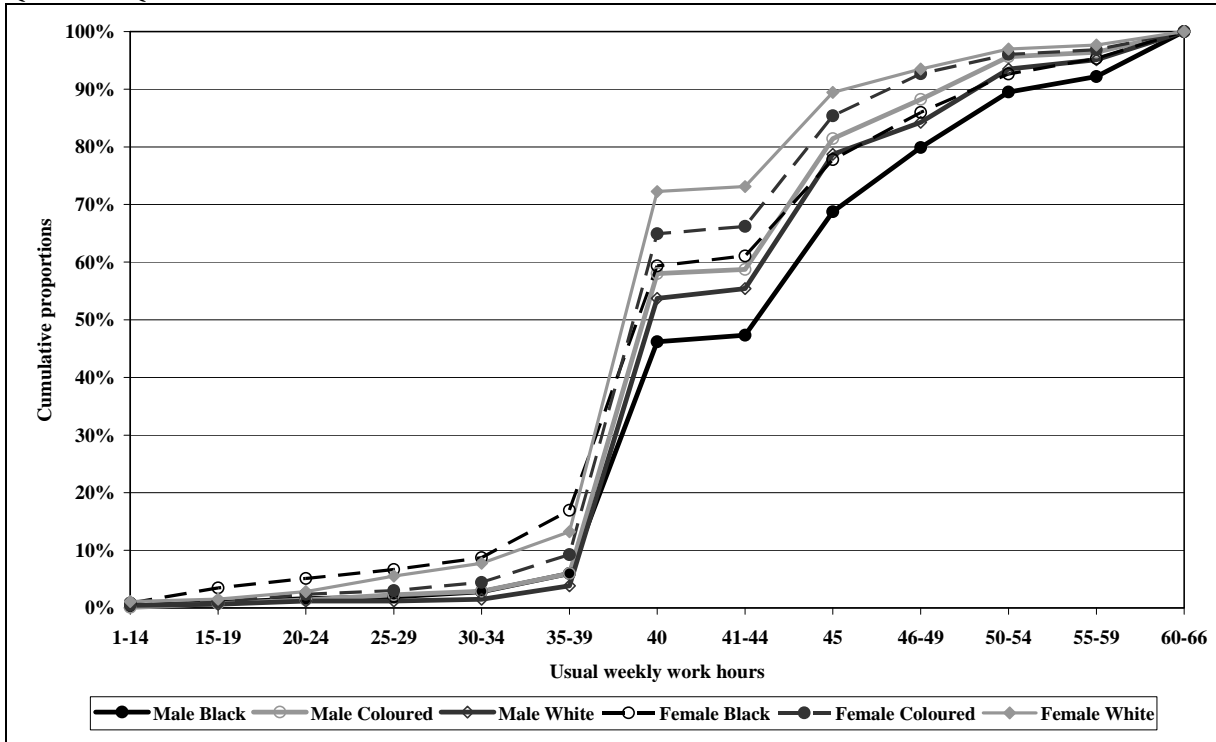

Source: Own calculations using QLFS 2011Q4 data.

Figure A.2: Cumulative distributions of weekly usual hours worked of formal sector employees by race, QLFS 2011Q4
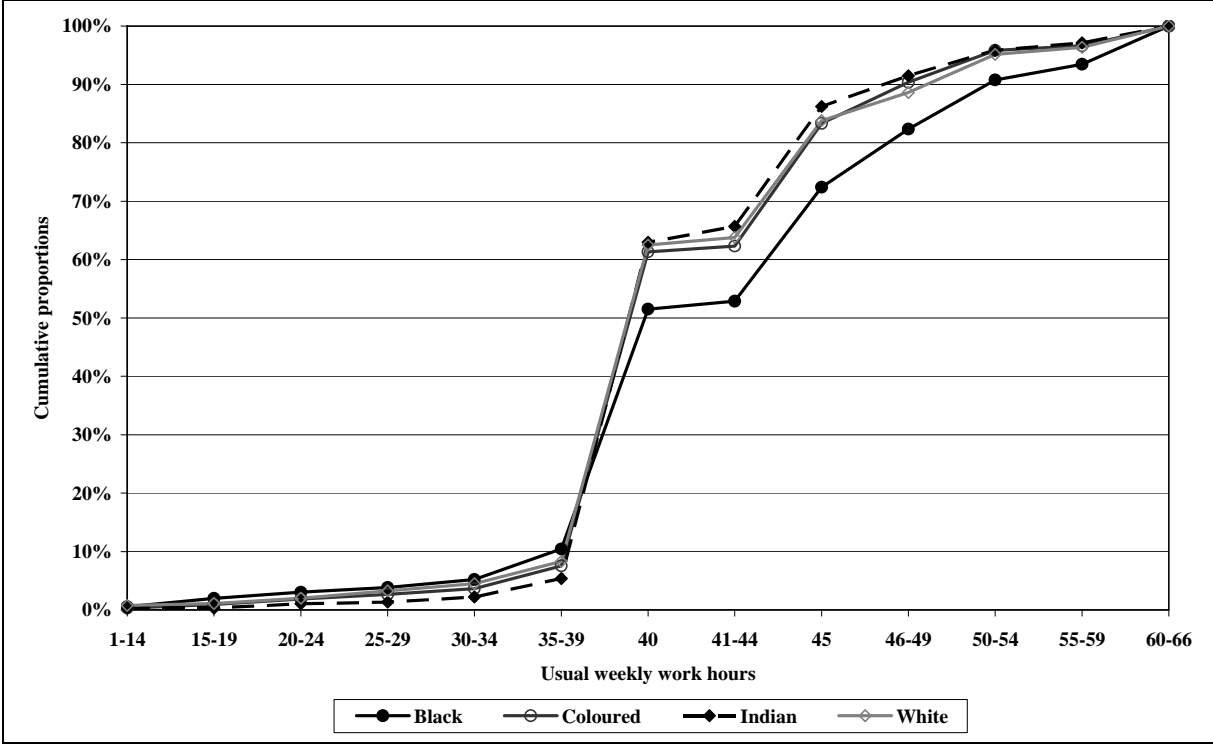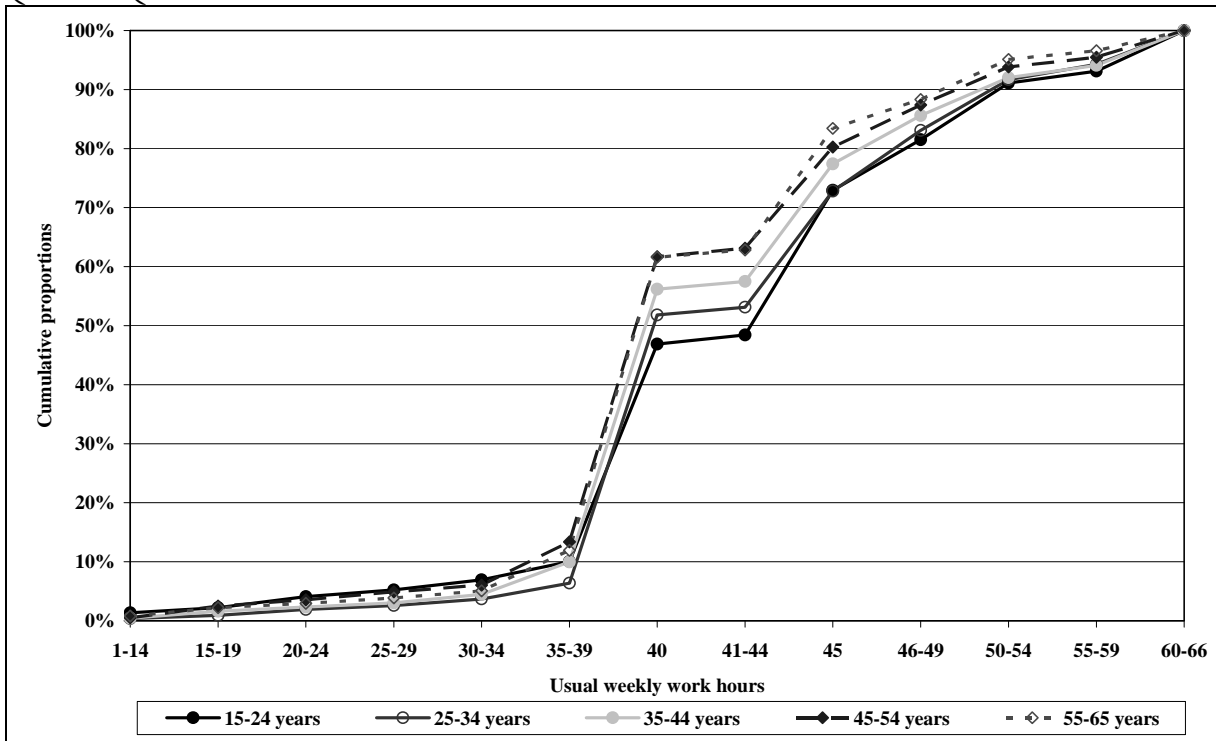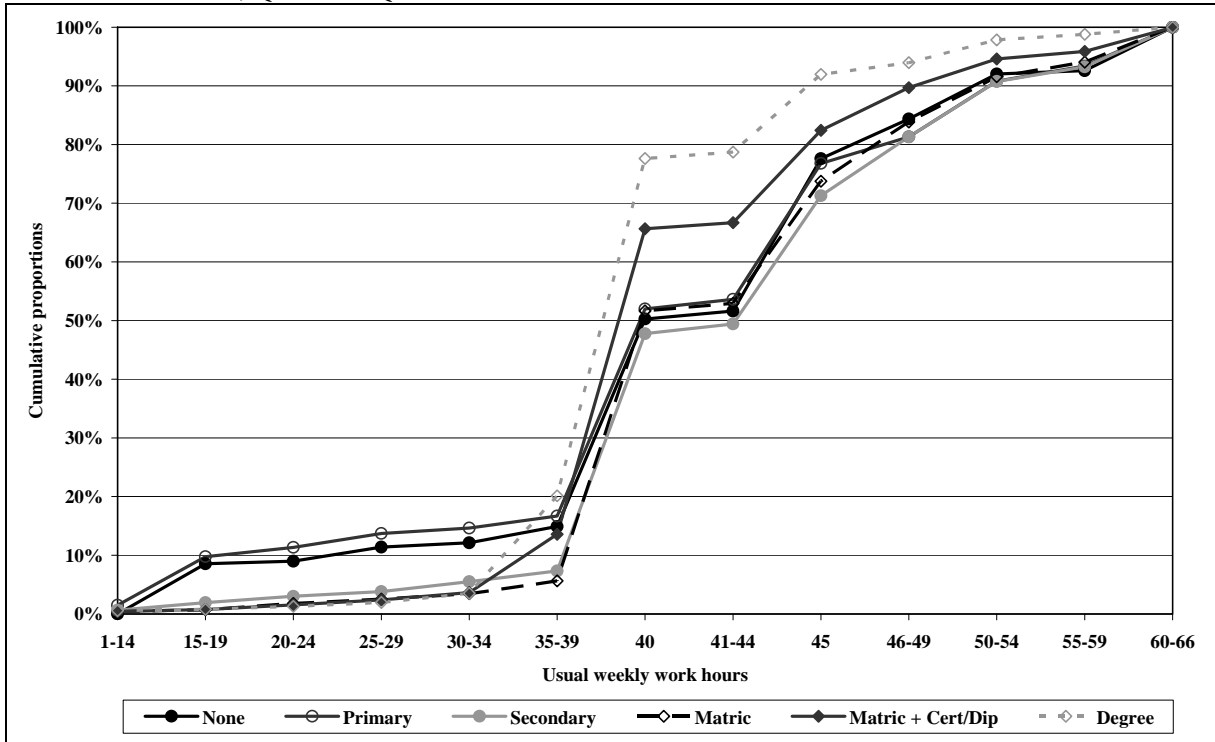

Source: Own calculations using QLFS 2011Q4 data.

Figure A.3: Cumulative distributions of weekly usual hours worked of formal sector employees by gender and race, QLFS 2011Q4

Source: Own calculations using QLFS 2011Q4 data.

Figure A.4: Cumulative distributions of weekly usual hours worked of formal sector employees by age category, QLFS 2011Q4
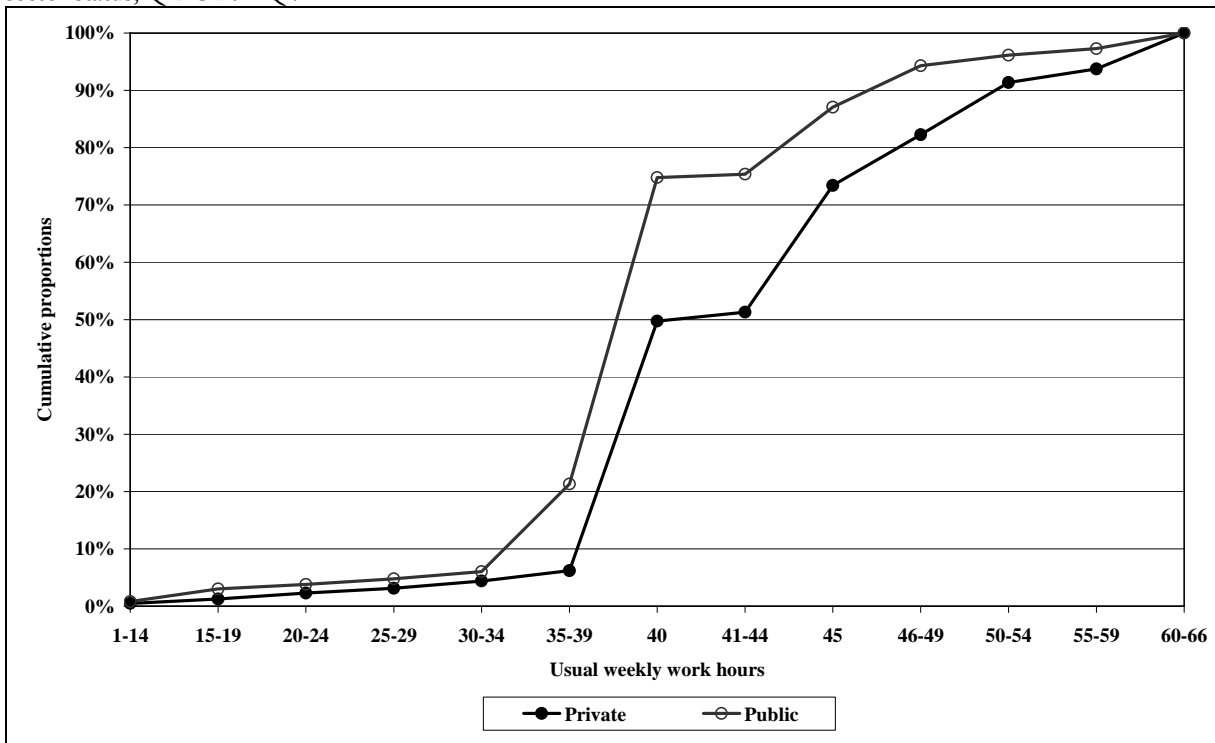

Source: Own calculations using QLFS 2011Q4 data.

Figure A.5: Cumulative distributions of weekly usual hours worked of formal sector employees by highest educational attainment, QLFS 2011Q4
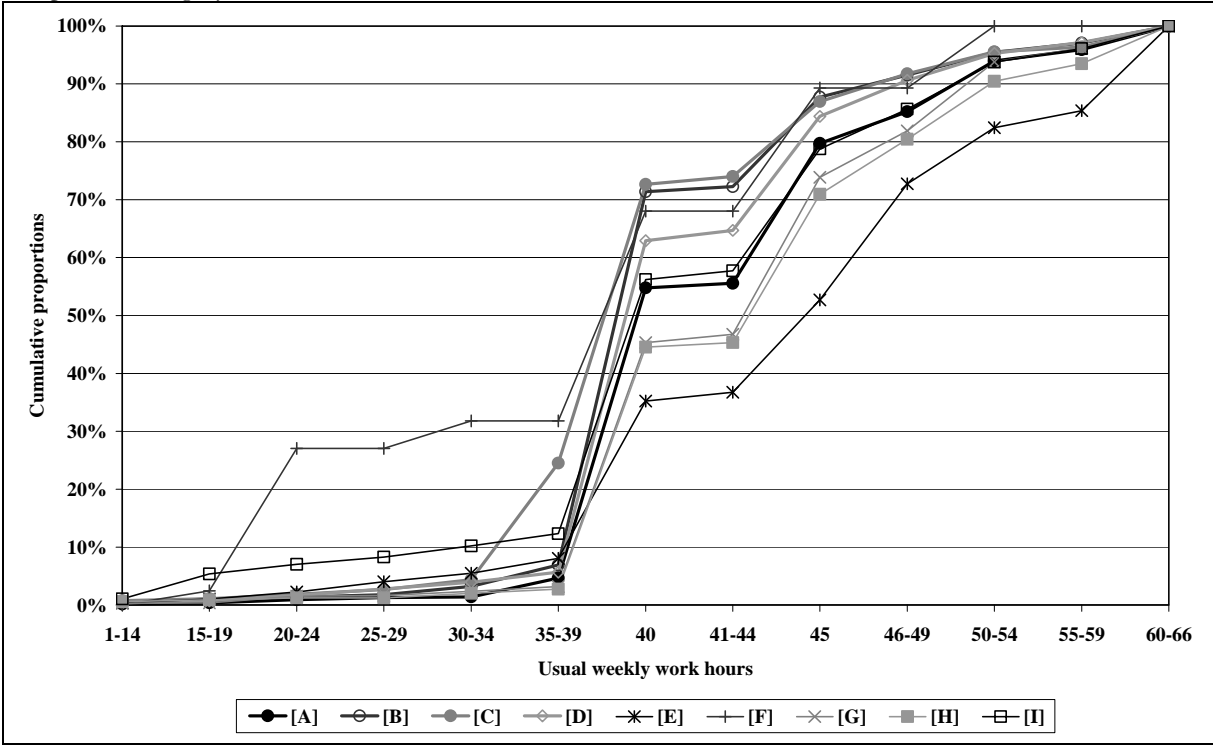

Source: Own calculations using QLFS 2011Q4 data.

Figure A.6: Cumulative distributions of weekly usual hours worked of formal sector employees by public/private sector status, QLFS 2011Q4

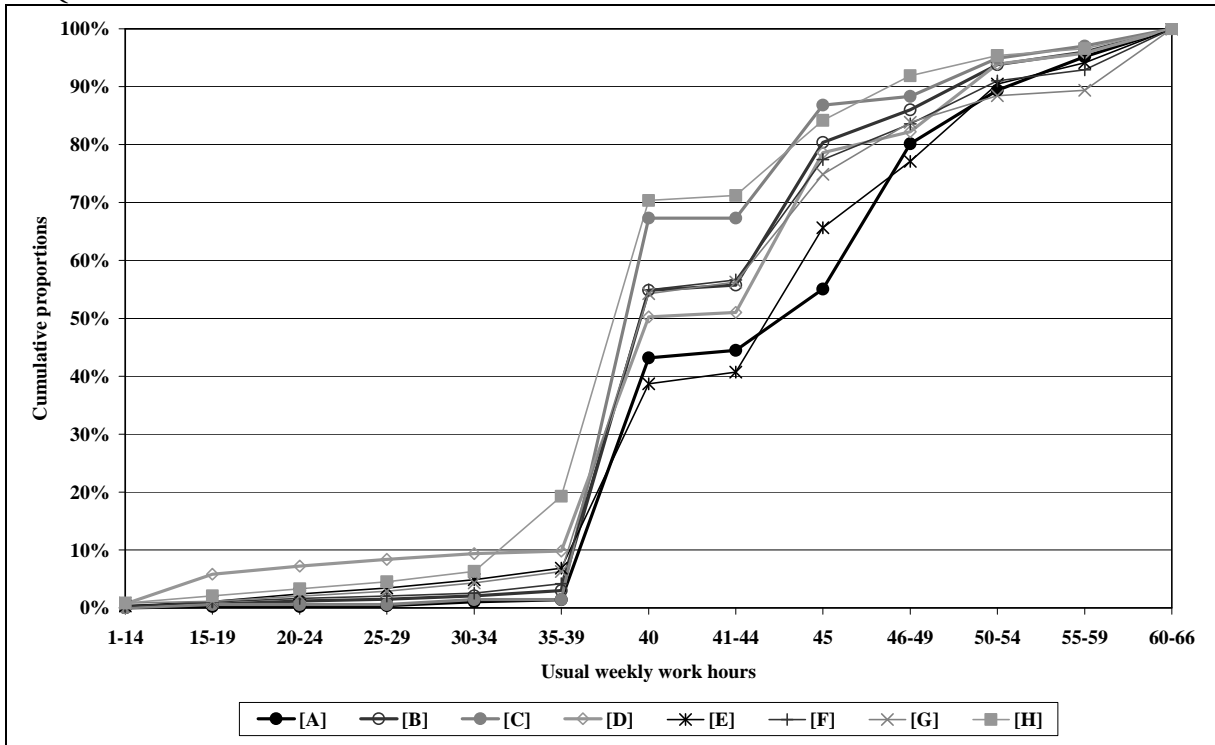Source: Own calculations using QLFS 2011Q4 data.

Figure A.7: Cumulative distributions of weekly usual hours worked of formal sector employees by broad occupational category, QLFS 2011Q4

Source: Own calculations using QLFS 2011Q4 data.

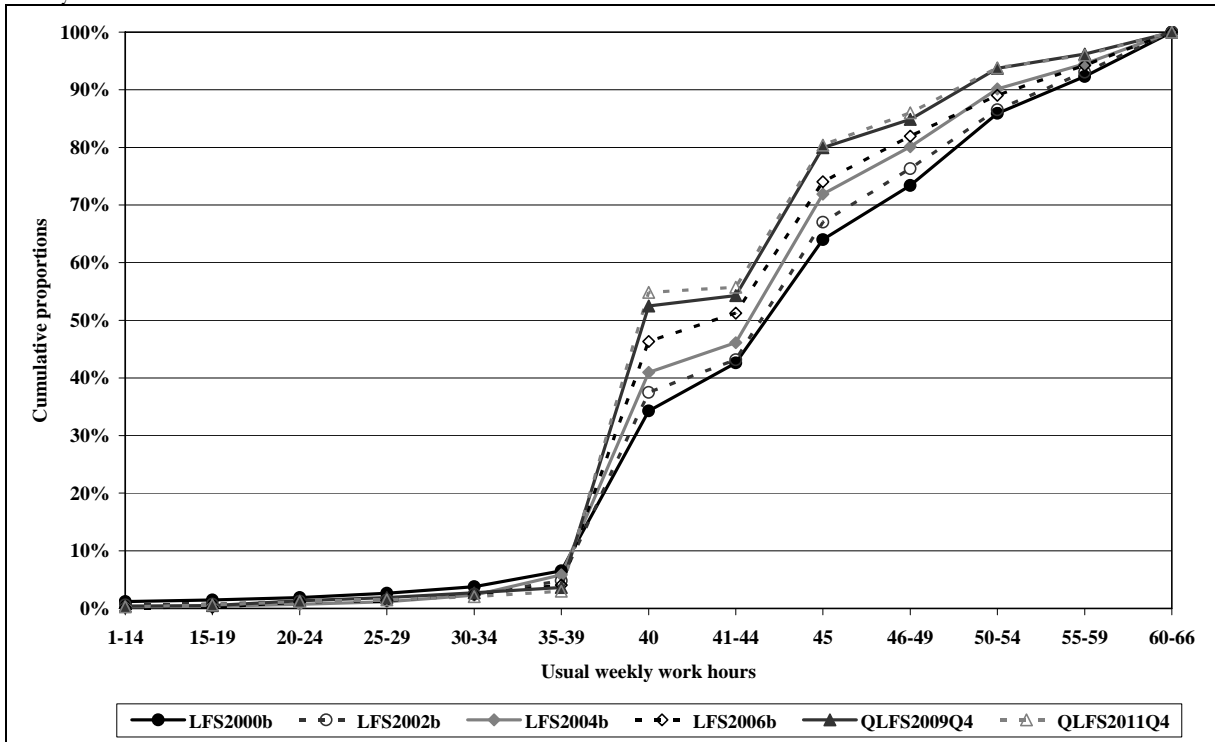| Highly-skilled – | A: Legislators, senior officials and managers |
	B: Professionals
	C: Technicians and associate professionals
Semi-skilled –	D: Clerks
	E: Service workers and shop and market sales
	F: Skilled agricultural and fishery worker
	G: Craft and related trade workers
	H: Plant and machinery operators and assemblers
Unskilled –	I: Elementary occupations

Figure A.8: Cumulative distributions of weekly usual hours worked of formal sector employees by broad industry category, QLFS 2011Q4

Source: Own calculations using QLFS 2011Q4 data.
Primary –   A: Mining and quarrying
Secondary –   B: Manufacturing, C: Electricity, gas and water supply, D: Construction
Tertiary –   E: Wholesale and retail, F: Transport, storage and communication, G: Financial,
                      insurance and business services, H: Community, social and personal services

Figure A.9: Cumulative distributions of weekly usual hours worked of formal manufacturing employees, selected surveys

Source: Own calculations using LFS/QLFS data.