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## DataFirst Technical Papers

An introduction to the Manpower Survey Data

*by*  
*Andrew Kerr*

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# An introduction to the Manpower Survey Data

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In this report I describe the Manpower Surveys, which were undertaken from 1965 to 1994. DataFirst has acquired some data from these surveys and placed them on the DataFirst web portal for public access. I thus also describe the data that has been made available and provide some basic descriptive analysis of the data, with the aim of giving an introduction to the data and encouraging other researchers to make use of it.

## Manpower Survey (MS)

The MS was a firm survey which provided detailed data on the occupations, gender race and sector of the employed in each establishment during the Apartheid period, stretching back to the 1950s (Crankshaw, 1995; Seekings, 2003; Mariotti, 2009; Department of Manpower/Labour, various years). It was conducted by the Department of Manpower (DoM) (which later changed its name to the Department of Labour) until 1985, and then the Central Statistical Services (CSS- the forerunner of Statistics South Africa) until 1996 (Crankshaw, 1995) when it was renamed the Occupational Survey (Lee, Woolard, & Wilson, 2004). In 1998 it was replaced by the Survey on Occupation by Race and Gender, but this survey was discontinued and never made it beyond a pilot phase (Lee, Woolard, & Wilson, 2004).

Up until 1988 the Manpower survey had been an establishment survey. In 1988 the CSS changed the survey from an establishment level (or plant level) survey to an enterprise level survey- a definition based on the legal definition of the firm (CSS 1988).

## Sampling

The sampling procedures changed after the CSS took over the survey in 1987. Most of the detail on the sampling procedures before and after these changes comes from the post-change Manpower survey reports. Crankshaw (1995) also provides some details about sampling. Firms were sent a questionnaire by post and required to post the completed questionnaire back to the Department of Manpower/Labour or CSS, which paid the postage (Department of Labour, 1975).

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In 1988 and subsequent years a stratified sample was used. No further detail is given in the 1988 report but later reports give more detail. The 1990 report states that sampling (and presumably stratification) was done on the basis of the number of workers, except in wholesale and retail trade where it was done on turnover. In the 1994 survey report (CSS, 1997) stratification is discussed in more detail- firms were divided into 3 size groups whose cutoffs varied by industry.

The sample size was 250,000 establishments when run by the Department of Manpower according to Crankshaw (1995), although no source is given for this figure. Moll (1984) reports the 1983 sample size as 35000 firms and the response rate as around 80% and Crankshaw (1995) states that the sample size was 12800 in 1989 but neither gives any source for these figures. The 1992 Manpower survey report gives the number of respondent enterprises as 10 038 but does not give the number of firms sampled (CSS 1995). The 1994 report (CSS, 1997) states that 8810 firms were involved in the survey but it is not clear if this is the number of respondents or the sample size. The response rate for the Manpower Survey under the CSS was quite high, “approaching 90%” according to Crankshaw (1995), based on interviews conducted by with CSS officials.

Establishments and government workers in the TBVC states were excluded from the MS after these states became “independent” from South Africa (Crankshaw, 1995). Bophuthatswana and Transkei were thus excluded from 1979 onwards, Venda from 1981 onwards and Ciskei from 1983 onwards (Crankshaw, 1995).

### Sampling frame

Little detail is given on the sampling frame in the early Manpower surveys. According to Crankshaw (1995) the establishments surveyed for the Manpower surveys were based on official lists from the Compensation Fund and Unemployment Commissioner. Thus establishments not registered with these entities were excluded from the sample. The MS covered all sectors of the economy, except the agricultural sector and also did not include domestic workers employed in private households. It only included those employed by firms or government, including state-owned firms (Crankshaw, 1995; Seekings, 2003; Lee, Woolard, & Wilson, 2004). In the CSS reports from 1987 onwards more detail is given on the sampling frame. Once the survey was taken over by CSS the sampling frame was augmented with CSS’s own data, for example from firm censuses undertaken separately (CSS, 1995, 1997).

### Criticisms of the Manpower Surveys

Two main criticisms of the Manpower survey data have been that occupational trends from the data have been prone to large changes across surveys and that the data do not look similar to employment data from the census (Roukens de Lange, 1993, cited in Bhorat and Ooshuizen (2004)). I show below that whilst there are some jumps in the series, particularly when changes were introduced to the sampling strategy and also as a result of some coding errors, there do not seem to be enough problems as to render the data unusable. I do not undertake a comparison with population census data in this report but I do show below that the later Manpower Surveys did seem to underestimate total employment compared to the nationally representative household surveys from the post-Apartheid period.

## A description of the data held by DataFirst

DataFirst was not able to access the unit record establishment level data from the Manpower Survey. What we have is aggregated data. But because the data is at a fairly low level of aggregation it is still an important and valuable data source that deserves further use. The survey reports produced by the Department of Manpower were extremely thick reports listing the number of workers employed by race, gender and occupation in each of 38 sectors of the economy. What DataFirst has been able to access is electronic versions of the tables listing the number of workers in each sector/race/gender/occupation cell. There are 4 racial categories, 38 sector categories, 2 gender categories and between 360 and 683 occupation categories depending on the particular survey year. The years covered are 1965-1994 inclusive. Between 1965 and 1985 the surveys were conducted every 2 years and from 1987 to 1994 the surveys were conducted every year. Thus there is a large amount of detail even though the data is aggregated and the data should thus still be useful to researchers wanting to explore historical aspects of the labour market in South Africa. One downside of the data is that because it is aggregated data it is not possible to put standard errors on any estimates. The 250 000 establishments that Crankshaw (1995) claims were included in the initial years suggests that something close to a census was conducted, in which case the lack of standard errors would not be a problem. However when the sample size was dropped to around 10000-13000 firms, which likely happened in the late 1980s, the lack of standard errors may be more of a concern.

### Classification of Occupations

The number of occupation/gender/race/sector cells varies over time because of an increase in the number of occupational categories. There are 360 occupational categories in 1965, 385 in 1975, 424 in 1985 and 685 in 1988. The 1988 report states that a new classification system called the “Standard Classification of Occupations” was used. In the data available from DataFirst the 1988 classification system is a more detailed version of the classifications used in the previous years. Occupation code 156000 was “teacher” until 1987 but in 1988 several sub categories are included and the 156000 teacher code is not. Thus 156100 is “secondary school teacher” and 156500 is “adult education teacher”. Thus it is not hard to aggregate up one digit from 1988 onwards to match the set of occupational categories from previous years.

The classification system used for occupations is similar to but not identical to the 1968 revision of the International Standard Classification of Occupations (ISCO). The 1 digit groups used in the Manpower Survey and the ISCO are shown in Table 1 and are fairly similar but not identical. The major difference is that artisans and apprentices are given their own 1 digit category in the Manpower Surveys whilst they do not appear at all in ISCO.

The survey reports for the earlier Manpower Surveys follow a version of ISCO-1958. It seems that these have been retrospectively fitted into the ISCO -1968 system of classification in the data DataFirst has accessed and made available. This has not resulted in large breaks in the data (see below) but researchers should keep this issue in mind when using the data.

## Usage of the Manpower Surveys in Research

There are several papers that use data from the Manpower Surveys. Mariotti (2011) used the data to explore changes in the South African labour market and in racially based job reservation legislation during Apartheid and Fedderke (2002) used the data to explore changes in the structure of the South African economy. Also the national accounts employment series provided by the South African Reserve Bank (SARB) and used by macro economists are based on the Manpower surveys during the period they were undertaken (Bhorat and Oosthuizen, 2004). Providing the Manpower Survey data in less aggregated form than the SARB national accounts data may thus also lead to improvements in the historical employment time series.

## Trends in Employment

In this section I present some descriptive analysis from the Manpower Survey data and comment on some of the obvious problems with the data.

Figure 1 shows employment by race and by gender between 1965 and 1994. There is some evidence for a break in the series between 1985- the last time the survey was conducted by the Department of Labour/Manpower - and 1987- the first time the survey was conducted by the Central Statistical Services. Crankshaw (1995) argues that the change in the sampling frame is the likely cause of the discontinuities in some of the Manpower series he examines. This is partially corroborated by the preface to the Manpower survey report in 1987 (CSS, 1988), which states that “the sampling and raising techniques employed with the taking and processing of the survey, corresponds to those usually employed by the Central Statistical Service in sample surveys and may differ from those that were employed with past Manpower Surveys.” The 1988 report also emphasises the change from an establishment survey to an enterprise survey that occurred in 1988, as well as a change in the way occupations were classified (see above). There were also possible earlier changes to the sampling methods used by the Department of Manpower/Labour- the 1977 report states that “This survey was conducted on a sample basis”, which was not stated in prior reports.

The exclusion of establishments located in the Transkei and Bophuthatswana homelands between 1977 and 1979 periods – as discussed by Crankshaw and stated in the 1979 Manpower reports –is not evident from the figures on black employment. This is surprising given that the combined population of these two homelands in 1975 was estimated to be 5.6 million people by Butler, Rotberg and Adams (1978). However, one possible explanation is that many of these homeland residents would have actually been employed in firms located outside of the homelands and thus would still be included in the Manpower Survey estimates (Roukens De Lange and van Eeghen, 1990). These authors estimate formal employment in Transkei and Bophuthatswana at just over 300 000 in 1980, low enough that the absence of a large drop off when these homelands were excluded in Figure 1 is not that worrying.

Figure 2 gives the breakdown of employment by 1 digit SIC. A break after the CSS took over the Manpower Survey in 1988 is again noticeable- particularly in transport, finance and trade. There is also a break in the services sector series between 1991 and 1992, which originates in measured public sector employment (not shown).

Figure 3 shows employment in a number of sub sectors for manufacturing. Even at this level the change to CSS running the survey in 1987 and possibly a differing sample frame does not seem to have introduced any large breaks in these series. There is one obvious data quality issue though- the total for basic metals increases by 250% in 1977 and then drops down again the following survey.

The Manpower Survey data allows for breakdowns of employment into between 360-683 occupational categories. In Figure 4 I break occupations down by 1 digit occupational classification, splitting code 8 into production workers and labourers. In 1985 the split between labourers and production workers seems to have been different than in other years- there are too few labourers and too many operators and production workers.

Figure 5 gives the distribution of 1 digit occupations in each year. There is a clear increase in the proportion of skilled and semi-skilled occupations over the 30 year period and a decline the proportion of unskilled occupations.

Figure 6 shows the trend in employment by public and private sector. Especially noticeable is the strong decline in private employment in the late 1980s until 1994. Interestingly the share of public sector employment in total employment is fairly constant across the entire period- at around 25% of total employment.

Figure 7 compares the Manpower Survey data to a number of other sources of long run employment series. Each series is not necessarily comparable and not all are estimates from nationally representative micro data on firms and workers. The first point to note is that the Manpower Survey series and the National Account series from the SARB Quarterly Bulletins are fairly close. As noted above the National Accounts data is based on the Manpower data so this is not surprising. What is perhaps more surprising is how much less employment was captured in the manpower surveys than the household surveys conducted by Stats SA that start in October 1994- the series is labelled PALMS without domestic work and agriculture in the figure- these sectors were not covered in the Manpower Surveys. The PALMS series should be somewhat higher because it also includes employment in unregistered businesses that the Manpower survey did not set out to capture. But this accounts for probably only between a third and half of the gap in employment between the PALMS series and the Manpower series in 1994- which was close to 3 million jobs.

For interest Figure 9 also includes an aggregated formal sector employment series without agriculture constructed by Roukens De Lange and van Eeghen (1993) from a number of sources including the Manpower surveys, population censuses and current population survey. This seems to have captured employment levels more accurately than the Manpower series. If we believe the household survey data then the trend from the Manpower Surveys in the 1990s of declining employment seems incorrect.



## Conclusion

In this report I have described the Manpower Surveys and a data set based on these surveys that has been made available to the public by DataFirst. Considering that the data is the basis of the South African macroeconomic time series data on employment between the 1950s and the 1990s little work has been done to better understand important aspects of the survey and how these changed over the 40 years the survey was run. Thus I have given some detail on the sampling frame, the sample sizes, the unit of observation (enterprise or establishment), as well as a description of what data is being made available by DataFirst.

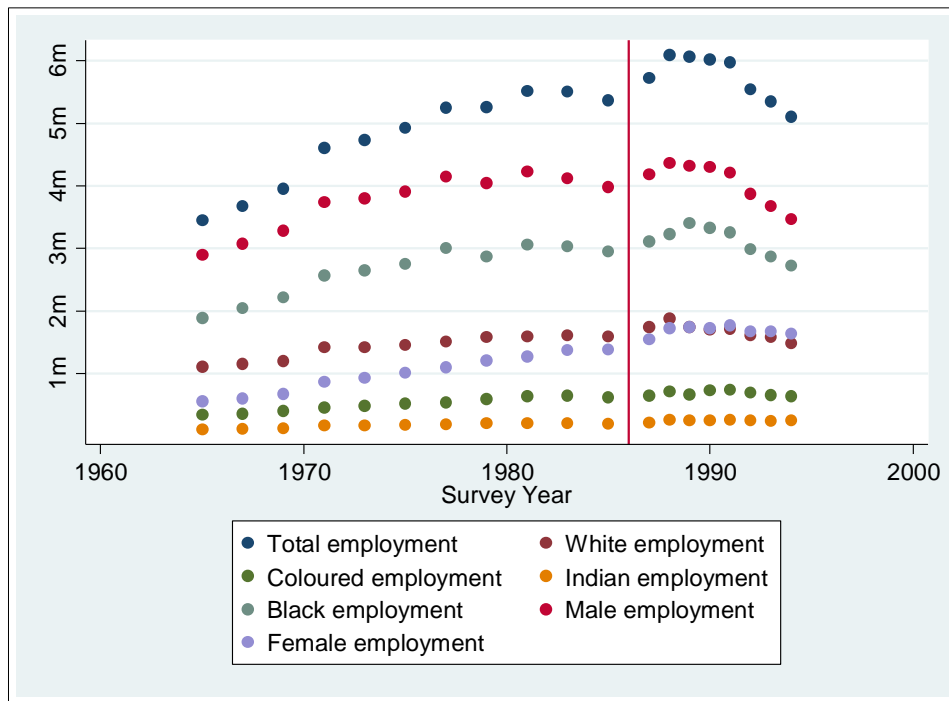
I have also showed that creating descriptive trends in employment by race, gender, occupation and sector is possible using the data. I have noted that there are some data quality issues and that the Manpower Surveys have been criticised. These criticisms have not been based on actual analysis of the data but rather on the published reports. Since the data is now available this will hopefully spur further work on checking the data and comparing it to other sources, for example the population censuses in 1960, 1970, 1980, 1985 and 1991, for which micro data is also now available.

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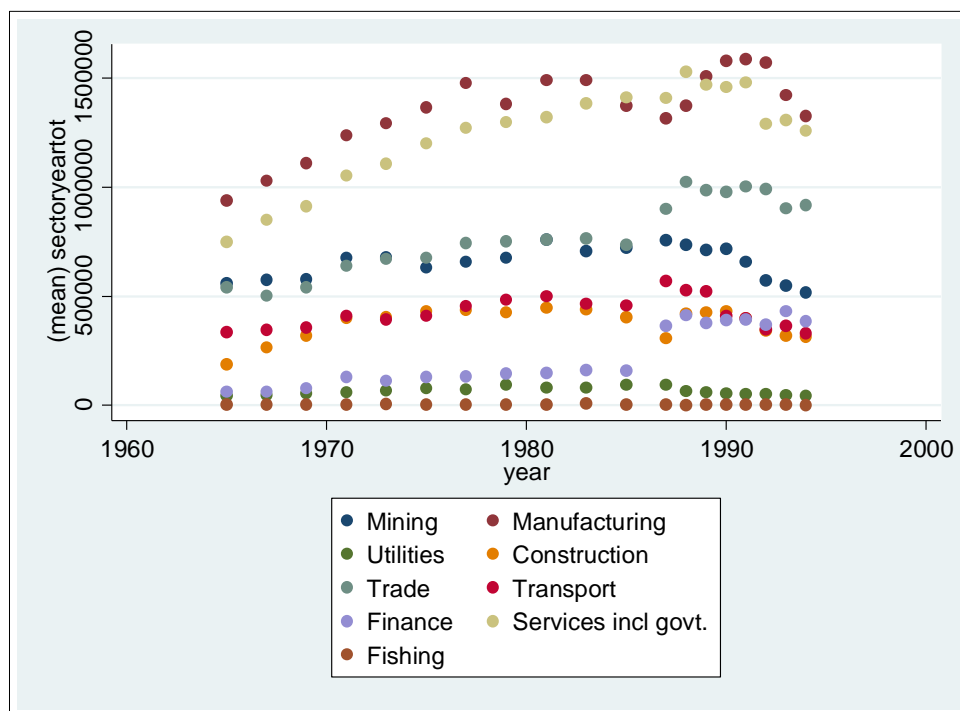
## Figures

**Figure 1: Total employment by race and gender from the Manpower survey data**

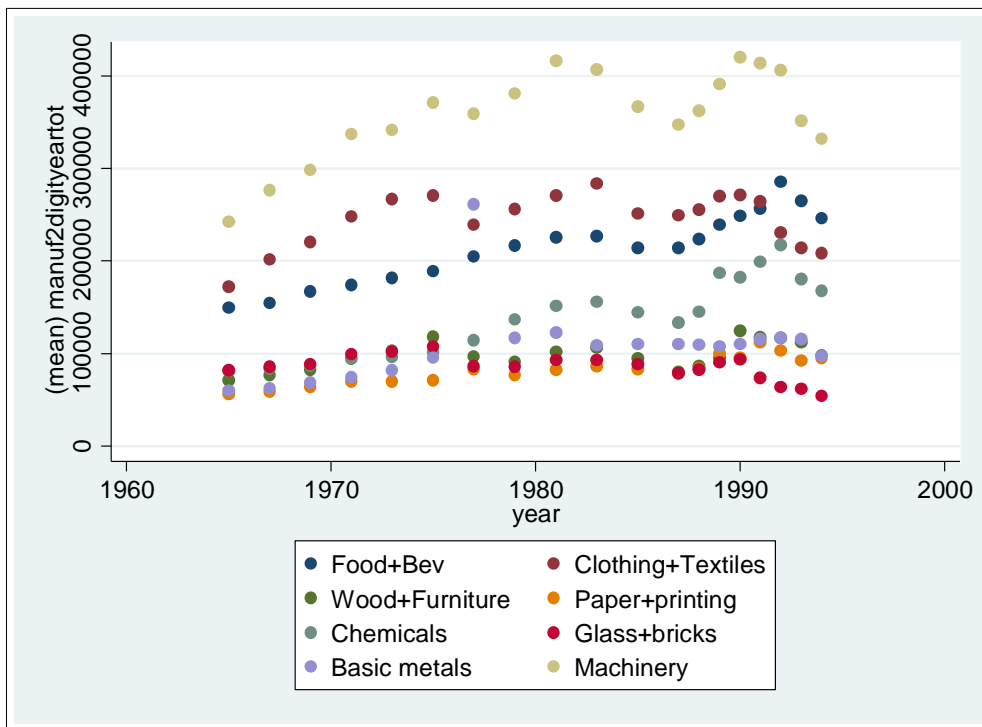


Notes: The vertical line represents the start of the period in which the survey was conducted by the Central Statistical Service rather than the Department of Manpower/Labour

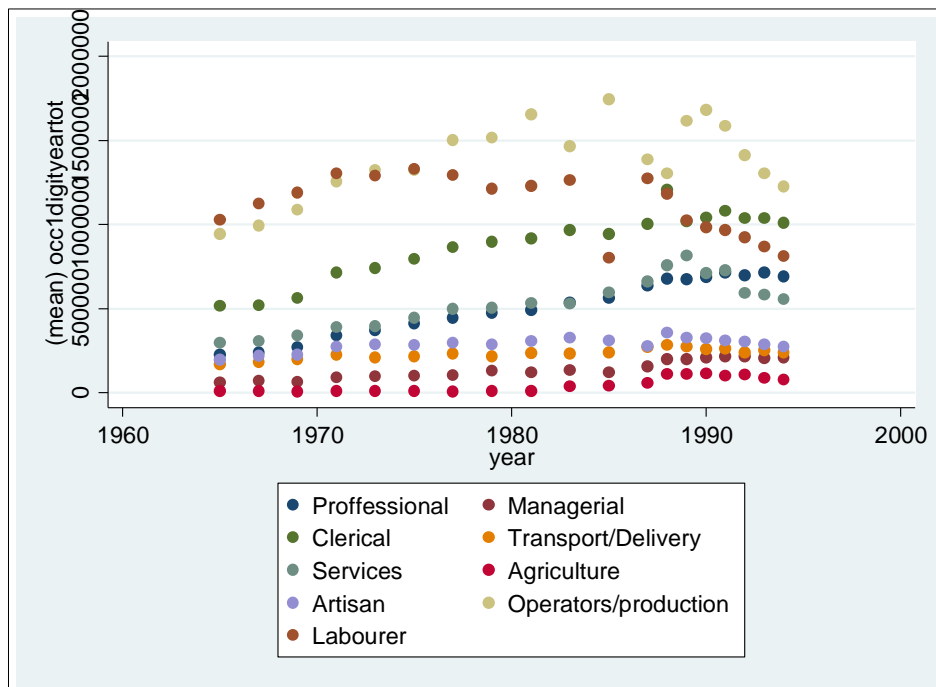
**Figure 2: Employment by 1 digit SIC**



**Figure 3: Employment by 2 digit SIC in Manufacturing**



**Figure 4: Employment by 1 Digit Occupation**



Note: Labourers and Production workers are both included in the 1 digit code 8 in the data but are separated in the survey reports so I have done the same here.

Figure 5: One Digit Occupational percentages by year

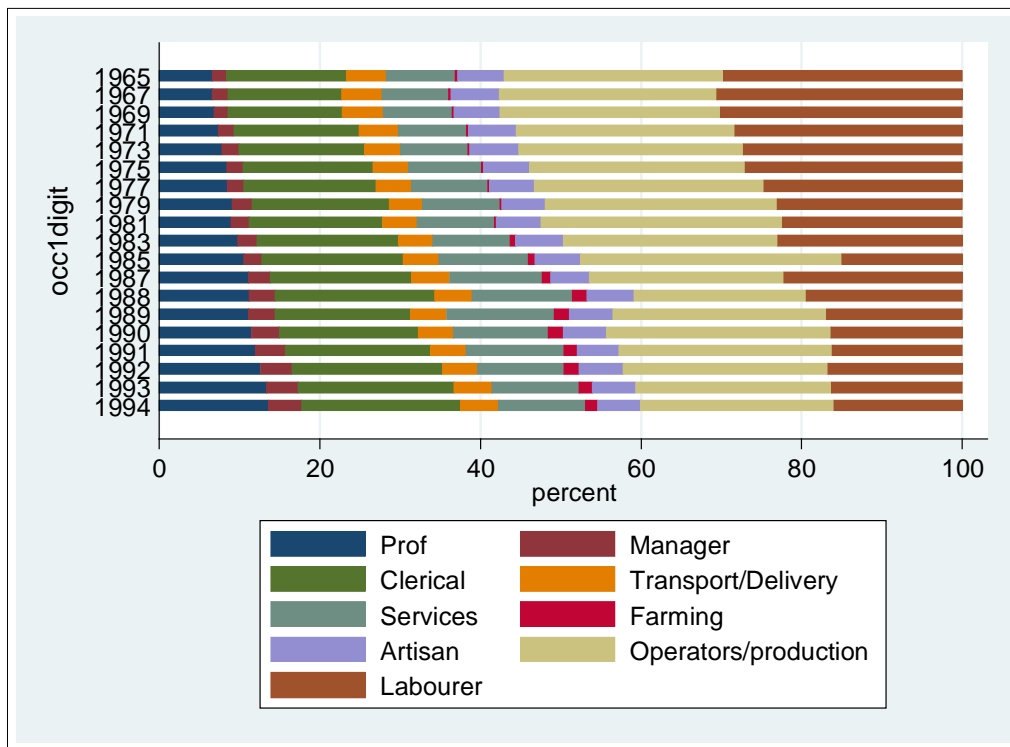
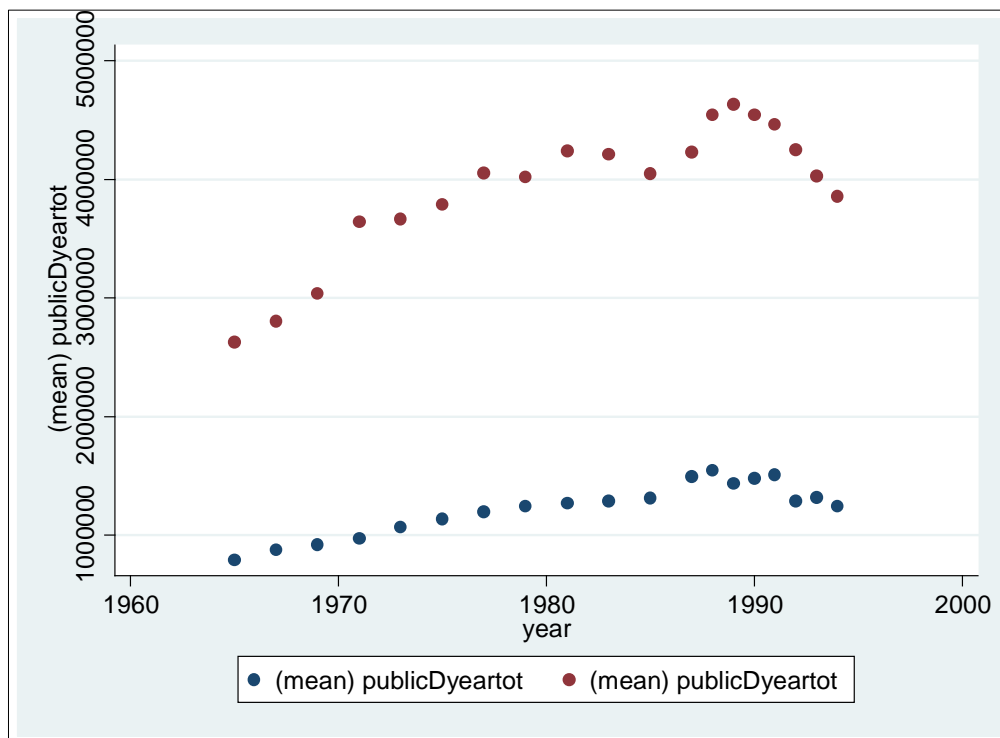
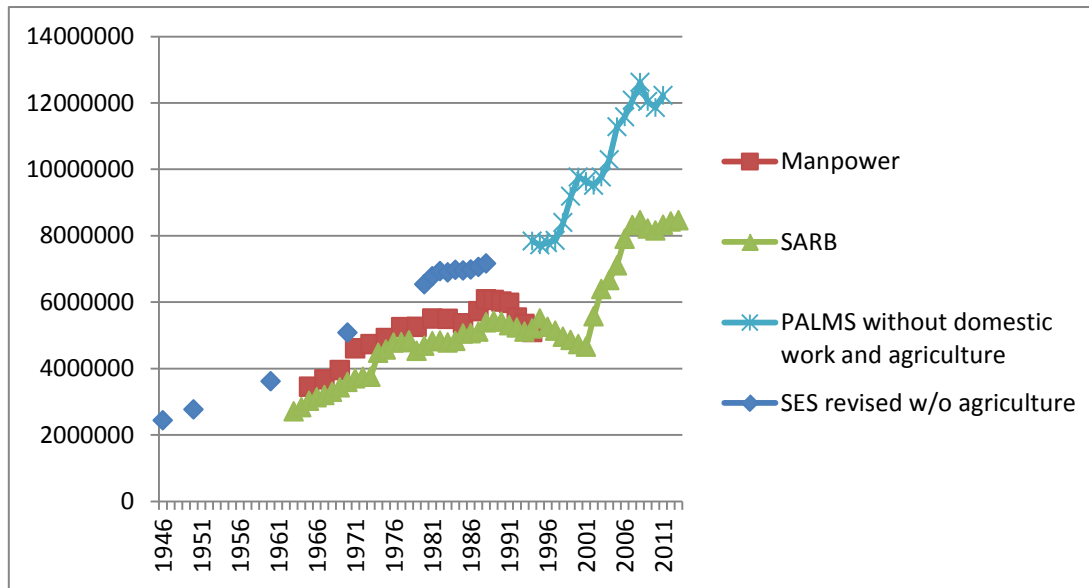


Figure 6: Public and Private sector employment trends



Notes: Employment in sector Electricity, Gas and Water has all been treated as public employment, given the very large share in this sector of the state electricity company Eskom.

Figure 7: Comparison of long run employment series



Footnote: SES Revised is a revised version of the Standardised Employment Series constructed from a number of sources by Roukens De Lange and van Eeghen (1993). SARB is the South African Reserve Bank Quarterly Bulletin data.

## Tables

**Table 1: Occupational Classifications in ISCO and the Manpower Survey Data**

<b>1 digit occupation</b>	<b>Manpower Survey Data</b>	<b>ISCO-68</b>
1	Professional, Semi-Professional and Technical	Professional, Technical and Related Workers
2	Managerial, Executive and Administrative	Administrative and Managerial Workers
3	Clerical and Sales workers	Clerical and Related Workers
4	Transport, Delivery and communication workers	Sales Workers
5	Service workers	Service Workers
6	Agricultural workers	Agricultural Workers
7	Artisans and Apprentices	Production and Related Workers, Transport Equipment Operators and Labourers
8	Production workers and labourers	

# About DataFirst

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DataFirst is a data service dedicated to making South African and other African survey and administrative microdata available to researchers and policy analysts.

We promote high quality research by providing the essential research infrastructure for discovering and accessing data and by developing skills among prospective users, particularly in South Africa.

We undertake research on the quality and usability of national data and encourage data usage and data sharing.

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