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South Africa Country Report

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The aim of this report is to provide an overview of the economic developments and trends in South Africa since the first democratic elections with a focus on the changing structure of production and employment in the South African economy. Against the backdrop of the various policy frameworks implemented by the South African government to affect the quantity and quality of employment, this paper analyses sectoral shifts in production and employment, changes in firm characteristics and overall trends in labour market outcomes.

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1. Introduction

With the first democratic elections in South Africa in 1994, the newly elected government inherited an economic system of low growth, high government debt, mass unemployment, poverty and inequality with little worker protection, especially of African workers. To address these socio-economic problems, the newly elected government combined a development path of job creation through macro-economic stability, fiscal discipline and export oriented growth and a radical restructuring of the labour market with a focus on worker rights. Thus, during the 1990s South Africa was not only reintroduced into the global economy through the lifting of sanctions and deliberate trade liberalizations, but various progressive labour regulations were introduced to create a more inclusive labour market. The rationale of these policies was to create an environment that would improve the quality of employment for South Africans, especially those most disadvantaged group under apartheid. Together these two broad policy changes introduced a tension which firms had to grapple with – how to respond to a new set of labour regulations whilst at the same time facing increased global competition.

The aim of this report is to provide an overview of the economic developments and trends in South Africa since the first democratic elections with a focus on the changing structure of production and employment in the South African economy. Against the backdrop of the various policy frameworks implemented by the South African government to affect the quantity and quality of employment, this paper analyses sectoral shifts in production and employment, changes in firm characteristics and overall trends in labour market outcomes.

The report is structured in five sections. The first section draws a picture of the socio-economic problems which the new government inherited in the early 1990s and outlines the various policy strategies implemented since 1994 through which the government has tried to address these issues. The outcome of these policies is illustrated through a broad overview of the macroeconomic trends between 1994 and 2014. The second section investigates the impact of increased trade on the South Africa's economy and its industrial sectors. Using a Chenery-style decomposition it provides a detailed analysis at the sectoral level of output and employment changes due to changes in domestic demand, exports, imports and technology. The sectoral level analysis is then complemented in the third section by an analysis of firm level data looking at changes in the characteristics of firms and their total factor productivity. The fourth section presents a detailed analysis of employment and earnings trends over the last twenty years, and the final section concludes.

2.1 The challenge of 1994

1994 saw a new dawn for South Africa; it was the era of democracy, an era that promised to be filled with new possibilities and opportunities for all South Africans. The newly elected African National Congress (ANC) was faced with many challenges, most notably, the need to readdress past injustices including the economic, social, and spatial disparities of individuals within the economy as a result of Apartheid.

Specifically, the South African society in the early 1990s was characterized by significant levels of poverty and inequality. As is shown in table 1, almost one quarter of the South African population had to survive on less than $2 per day in 1995 with just over half of South Africans living on less than $4 per day.

Table 1: Share of population living in poverty in 1995 (year 2000 prices)

year	% living below $1 per day/ R87 per month	% living below $2 per day/ R174per month	% living below 4$ per day/ R354 per month
1995	9.40%	24.20%	51.1% (20.2 million)

Source: UNDP, 2003

Poverty in 1995 followed a hierarchy along racial lines (May, 1998). Thus, while 61 per cent of the African community and 38 per cent of the Coloured community lived in poverty, only 5 per cent Asians and 1 per cent of Whites faced the same plight. With the African population constituting 77 per cent of the entire South African population in 1994, this meant that almost 19 million Africans were living in poverty. One contributing factor was the highly skewed labour market (see table 2). Labour force data of 1995 indicates that Whites were the most economically included racial group in the labour market with the highest rate of labour force participation (68.6%), the highest rate of employment (66.4%) and the lowest rate of unemployment (3.3%). In stark contrast were labour market experiences of Africans. Of all the race groups, African labour force participation was the lowest, with low employment rates and extremely high unemployment rates (20%).

Table 2: Labour market outcomes in 1995

	Participation	Employment	Unemployment

Overall	51.4	43.3	15.6
Male	62.1	54.5	12.3
Female	41.1	32.7	20.5
African	45.9	36.7	20.1
Coloured	64.2	55.3	13.8
Indian	60	54.4	9.3
White	68.6	66.4	3.3

Source: Banerjee et al, 2007

Thus, while the election in 1994 could be seen as the culmination of political liberation of Africans in South Africa after decades of political struggle, it only signaled the start of economic liberation. The new government now had to decide how best to restructure the economy to ensure that all South Africans, but especially the previously excluded and disadvantaged African community, would be able to participate and benefit from the economy.

Box 1: Political system of South Africa

The South African political system is a constitutional, parliamentary democracy with national, provincial, and local levels of legislative and executive government structures. South Africa is divided into nine provinces and every five years South African citizens elect representatives to the National Assembly as well as their provincial legislature. The National Assembly then elects the South African President.

Since the first fully democratic elections in 1994, the African National Congress (ANC) has consistently obtained the vast majority of votes - at times in excess of 2/3 of votes (see table 3) - and has been the ruling party at the national level as well as most of the provinces (only the Western Cape has been ruled by an opposition party, the Democratic Alliance, since 2009). During the post-Apartheid period the ANC has been in alliance with the Congress of South African Trade Unions (COSATU) and the South African Communist Party (SACP), two allies during the struggle against the apartheid regime. This alliance is described as the Tripartite Alliance and neither COSATU nor the

SACP has contested elections independently but instead provide support to the ANC with their members serving in parliament as members of the ANC.

The dominance of the ANC has meant that South African government policy has been influenced by the objectives of the ANC defined in the Freedom Charter (1955) and outlined in the ANC's National Democratic Revolution. At the 50th Conference in Mafikeng (1997), the ANC defined the goal of the National Democratic Revolution (NDR) to create "a united, non-racial, non-sexist and democratic society. This, in essence, means the liberation of Africans in particular and black people in general from political and economic bondage. It means uplifting the quality of life of all South Africans, especially the poor, the majority of whom are African and female." http://www.anc.org.za/show.php?id=2356

Poor service delivery, increasing youth unemployment, an increasing number of corruption charges against government officials as well as general dissatisfaction with economic restructuring over the last ten years has led to a number of protests against the current government. In response, several groupings within the ruling party and the Tripartite Alliance have voiced the need to split away from the ruling party. Such movements, although small, have led to the founding of the Congress of the People (COPE) - a splinter party of the ANC - as well as more recent movements within COSATU including the National Union of Metalworkers South Africa (NUMSA) splitting away from the Congress and demanding COSATU's withdrawal of support for the ANC. At the same time, more populist movements like Julius Malema's Economic Freedom Front (EFF) have found support among the increasingly dissatisfied South African youth. The official opposition party, the Democratic Alliance (DA) has increased its support steadily, particularly in urban areas and in 2009 received the most votes in the Western Cape, which it now governs.

Table 3: General election results 1994 – 2014

1994		1999		2004		2009		2014	
Party[1]	% votes	Party	% votes	Party	% votes	Party	% votes	Party	% votes

[1]The various abbreviations refer to the following parties: African Christian Democratic Party (ACDP); African Independent Congress (AIC); African National Congress (ANC); African People's Convention (APC); Afrikaner

ANC	62.65%	ANC	66.35%	ANC	69.69%	ANC	65.90%	ANC	62.15%
NP	20.39%	DP	9.56%	DA	12.37%	DA	16.66%	DA	22.23%
IFP	10.54%	IFP	8.58%	IFP	6.97%	COPE	7.42%	EFF	6.35%
VF/FF	2.17%	NNP	6.87%	UDM	2.28%	IFP	4.55%	IFP	2.40%
DP	1.73%	UDM	3.42%	ID	1.73%	ID	0.92%	NFP	1.57%
PAC	1.25%	ACDP	1.43%	NNP	1.65%	UDM	0.85%	UDM	1%
ACDP	0.45%	VF/FF	0.80%	ACDP	1.60%	VF+/FF+	0.83%	VF+/FF+	0.90%
		UCDP	0.78%	VF+/FF+	0.89%	ACDP	0.81%	COPE	0.67%
		PAC	0.71%	UCDP	0.75%	UCDP	0.37%	ACDP	0.57%
		FA	0.54%	PAC	0.73%	PAC	0.27%	AIC	0.57%
		MF	0.30%	MF	0.35%	MF	0.25%	Agang SA	0.28%
		AEB	0.29%	AZAPO	0.25%	AZAPO	0.22%	PAC	0.21%
		AZAPO	0.17%			APC	0.20%	APC	0.17%

Source: Tripod; http://africanelections.tripod.com/za.html; IEC

2.2 Macroeconomic policy frameworks in South African from 1994 - 2014

In 1994, the newly-elected ANC government faced the challenge of rectifying past injustices with a sclerotic economy burdened by high debt levels and other structural challenges arising from Apartheid. To tackle this challenge it introduced the first, of what would become many, policy plans. The Reconstruction and Development Plan (RDP) of 1994 was the first major policy plan to try to redress

EenheidsBeweging (AEB); Azanian People's Organisation (AZAPO); Congress of the People (COPE); Democratic Alliance (DA); Democratic Party (DP); Federal Alliance (FA); Independent Democrats (ID); Inkatha Freedom Party (IFP); Minority Front (MF); Minority Front (MF); National Freedom Party (NFP); New National Party (NNP); New National Party (NNP); Pan Africanist Congress of Azania (PAC); United Christian Democratic Party (UCDP); United Democratic Movement (UDM); Vryheidsfront Plus/Freedom Front Plus (VF+/FF+).

the imbalances of the previous administration, socially, economically and spatially. The aim of the RDP was to combine growth, development, reconstruction, redistribution and reconciliation into one strategy. The RDP argued that growth and development were not mutually exclusive ideologies and specifically, that development without growth would not be financially possible, while growth without development would simply perpetuate South Africa's problems and thus not be socially and politically sustainable (Reitzes, 2008).

The RDP focused on seven crucial sectors/elements. The most notable of these were: the upgrading of infrastructure, a focus on resource-based industries, a change in labour and worker rights, and a focus on industry, trade and commerce. In parallel to the RDP the ANC adopted a conservative financial approach which entailed constrained government spending, appropriate tax reforms and a review of existing exchange controls – the abolition of the Financial Rand was seen as the initial step in the normalization of currency controls (Corder, 1997). This conservative macroeconomic approach was a direct result of the large debt burden which the new democratic government inherited and thus the lack of fiscal space available. It was also an attempt to make South Africa a more competitive country in terms of global production and exporting behavior, whilst not neglecting smaller firms that have the potential to absorb excess labour[2]. Micro, small and medium enterprises (SMMEs) formed an integral part of the RDP, with increased emphasis on individuals creating survivalist enterprises. The RDP promised to attempt to alleviate the main constraints faced by SMMEs, namely: the lack of access to credit, markets, skills, and supportive institutional arrangements.

Extensive education and training was seen by the RDP as a way for the previously disadvantaged labour force to actively contribute more to the economy. However, with the limited government resources at the time it was not necessarily possible for this problem to be adequately addressed – in 1994 it was estimated that there was a shortfall of 473 000 teachers and trainers in South Africa (National Teaching Board, 1994, p.47); and at the time only 3.7% of the South African population achieved at least a Grade Eleven/Standard Nine[3]. Finally, the RDP also argued for more support for labour unions in South Africa, and the establishment of the right to a living wage for workers in the economy (Corder, 1997).

Box 2: Infrastructure in South Africa

[2] According to Abor and Quartey (2010), small businesses contribute approximately 57% to the South African GDP, and are responsible for approximately 61% of South African employment, showing that SMMEs have only grown in importance over the years.
[3] Or an equivalent diploma/certificate.

Governments allocate expenditure on two different types of infrastructure: social and economic. Whilst the apartheid government had spent considerably on economic infrastructure especially on energy, the social infrastructure inherited by the ANC government in the mid-90s reflected the racial inequalities that characterised the Apartheid system. Thus, in line with the Reconstruction and Development Programme (RDP) infrastructure spending of the 1990s and early 2000s concentrated on health, education and community services including connecting informal settlements to electricity and water networks (Presidency, 2014).

However, over time it has become apparent that not enough was invested in the economic infrastructure. Continued economic growth and overall social improvements have placed a significant burden on the old infrastructure. Therefore, in line with ASGISA, the South African government pledged in 2006 to refocus its infrastructure spending on economic infrastructure (Presidency, 2014).

Over the medium term expenditure framework covering 2010- 2014, the South African government committed 80% of its infrastructure investment spending to economic services with energy and transport receiving around 2/3 of total infrastructure spending. Just less than 17% of total government spending on infrastructure is allocated to social services including health, education and community services. (DBSA, 2012) The National Development Plan (NDP) further identifies increased spending on economic infrastructure as a key driver of economic growth for South Africa. However, while supporting the overall infrastructure investment strategy of the government, various representatives of the private sector have raised concerns about the slow pace of implementation[4].

South Africa's economic infrastructure is significantly more developed than most of its neighbouring countries and the rest of Africa. It has eight commercial ports, a railway network that connects the hinterland to all major ports and neighbouring countries, and almost 21% of the 750 000Km of road network is paved. However, there are significant constraints, especially the rail and port systems. Ports and railways fall under the same governance structure (Transnet) which is more concerned with internal interests than necessarily national objectives. The monopoly power is also reflected in the costs of accessing this infrastructure. Port fees of South African ports are some of the highest internationally. It is therefore not surprising that some South African import and export companies increasingly utilize ports of other countries including Maputo in Mozambique. (DBSA, 2012)

[4] See for instance: "Capital spending on infrastructure too slow to spur economic growth", Razina Munshi, March 19 2014, Business Day Live, obtained from http://www.bdlive.co.za/national/2014/03/19/capital-spending-on-infrastructure-too-slow-to-spur-growth

While South Africa has got a large road network overutilization and under-investment in maintaining the road networks has led to an overall deterioration of the road system. According to SANRAL (2009), 78% of the road network is older than their initially intended life span. Thus, more than three quarters of the South African road network is in immediate need of replacement. (DBSA, 2012)

Currently the energy sector represents the largest constraint to economic growth. Although the ANC government inherited a functioning energy sector that could produce energy at low cost in the 1990s, insufficient investment in maintenance as well as unanticipated economic growth rates have led to excess demand for energy. This cumulated in an energy crisis in 2008, and again in 2014, with rolling power outages hitting private households as well as the commercial sector. Despite adding capacity since mid-2000s, demand has continued to exceed power supply. While South Africa still relies on coal as its main source of power generation, the government is increasingly investing into renewable energy sources (wind and solar) and hopes to have addressed the power constraints by 2030. (DBSA, 2012)

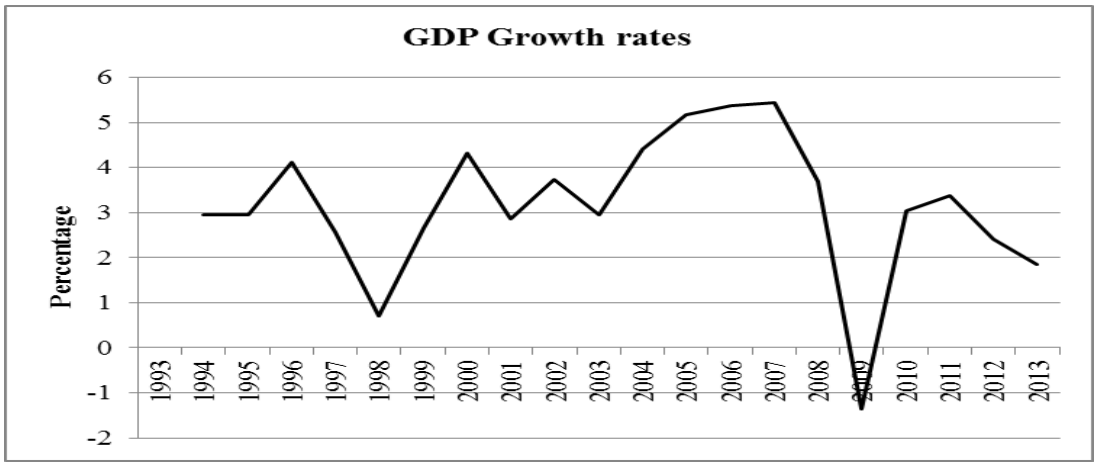
All in all, insufficient infrastructure has been identified as a main obstacle to unlocking South Africa's economic growth potential. Furthermore, it increases production costs of South African firms which affect their abilities to compete in the global market (World Bank, 2014)

In the face of continued macroeconomic uncertainty, particularly in relation to the fiscal sustainability of the RDP, the government initiated a new growth plan in 1996, the Growth, Employment and Redistribution strategy (GEAR). With the introduction of GEAR the RDP was essentially downscaled from a growth to a development strategy and eventually to a service delivery mechanism (Reitzes, 2008, p. 10). As such, GEAR's introduction received a mixed response; while the private sector felt that it was more accommodating to its needs, the unions and workers within the public sector felt that the adoption of GEAR in place of the RDP illustrated that the government was now more concerned with the growth of the economy instead of development[5] (Lombard, 2007, p. 157). Ultimately, however, GEAR aimed for macroeconomic stability and the rapid creation of employment and as such fell under the broader umbrella of the RDP.

[5]A sentiment that many felt was synonymous with a conservative, neo-liberal agenda.

GEAR identified three macroeconomic constraints: the current account deficit was a binding constraint on sustained economic growth; the low level of domestic saving was an obstacle to increasing the level of investment; and the government's deficit and tax policies contributed to the low level of savings (Reitzes, 2008, p. 10). To address the latter two concerns, GEAR opted to reduce the level of taxation on the economy[6], decrease the budget deficit, and to increase public expenditure on infrastructure[7]. More generally, GEAR was premised on the idea that the creation of an investment friendly business environment would attract foreign direct investment and create a competitive environment from which South African firms would be able to compete in the global market. This in turn would create employment.

Figure 1: South African GDP growth rates



Source: Stats SA : P0441 - Gross Domestic Product (GDP).

The effects of the proposed changes were noticeable – the budget deficit fell and South Africa embarked on a ten year period of relatively high economic growth (figures 1 and 2). GEAR enabled the government to decrease its borrowing, interest and inflation rates, and the current account deficit became more manageable – providing a more stable macroeconomic landscape with a steadily growing export sector (figures 3 – 4).

[6]The opposite of what was proposed within the RDP
[7]The opposite of the RDP's assertion that government should curb spending.

Figure 2: Budget deficit (1994 – 2013)

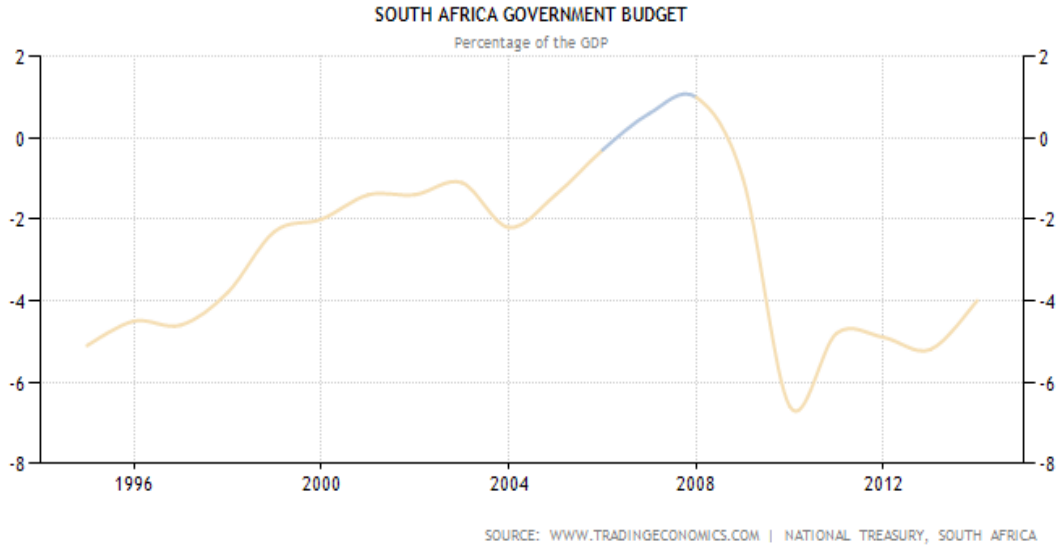
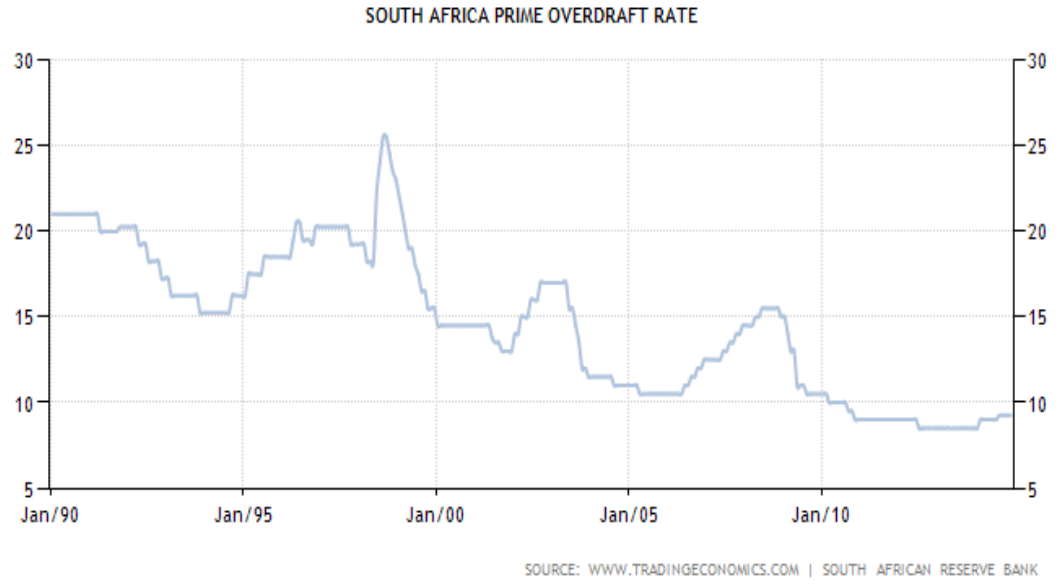
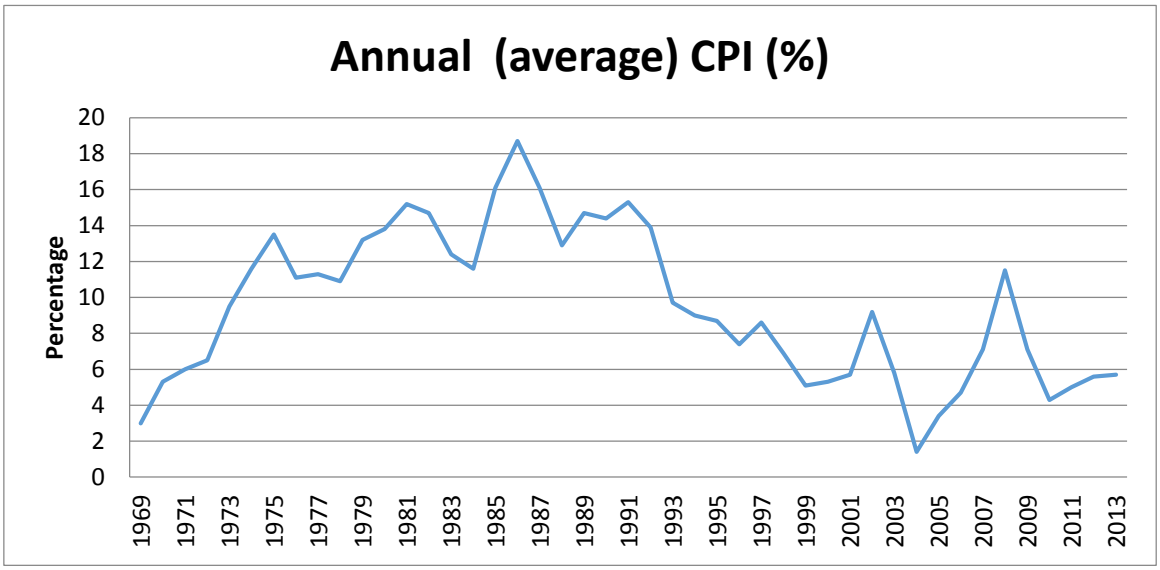


Figure 3: Interest rates 2001 - 2013



However, while GEAR seemed to have achieved all of its macroeconomic objectives with regards to creating stability, employment creation was not fast enough to substantially reduce unemployment (see figure 5).

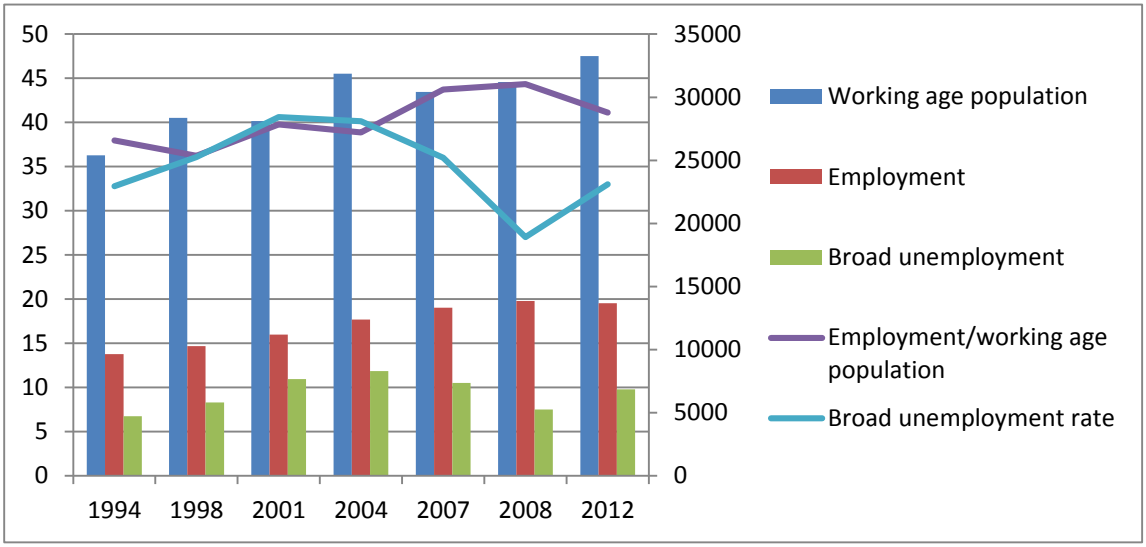
Figure 4: Inflation 1969 - 2013



Source: South African Reserve Bank, own calculations; Note: Consumer Price Index (CPI) is the official measure of inflation in South Africa

After almost 10 years of following the GEAR strategy and despite the accompanying economic growth, South African unemployment and poverty remained stubbornly high. While employment had increased over that period, it was not sufficient to absorb the increase in labour force participation, especially of African females and youth (Casale and Posel, 2002; Bhorat and Kanbur, 2006).

Figure 5: Employment and the South African working aged population. 1994-2012

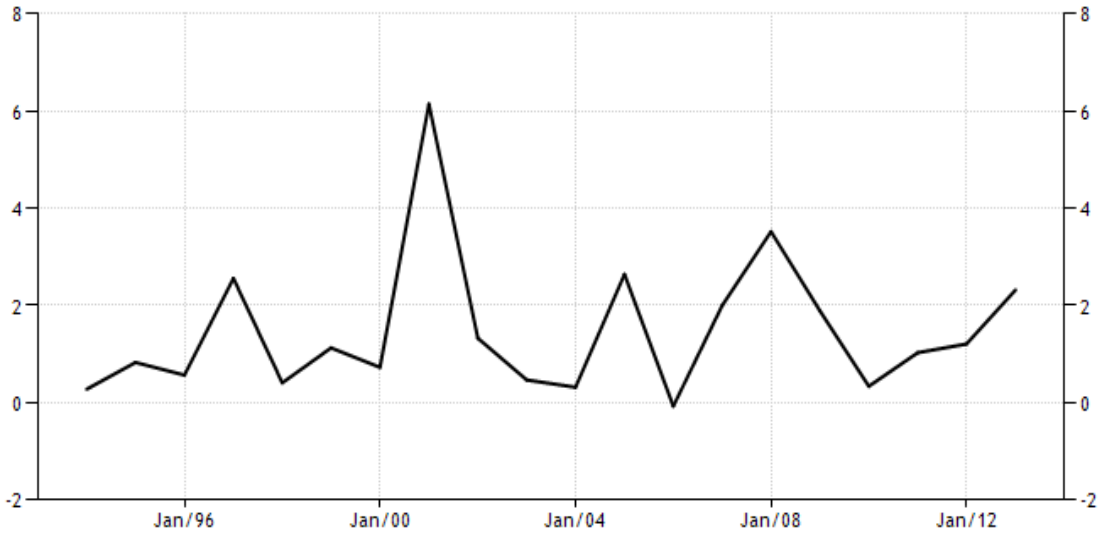


Source: Post-Apartheid Labour Market Series (Kerr et al, 2013); Note: working age population, employment and unemployment are measured in 1000s on the right-hand axis; employment/ working age population ratio and unemployment rate are measured in percentage on the left-had axis.

There is no consensus as to why the employment creation promised by GEAR failed to materialize especially since economic activity was consistently growing, although a key argument has been the increasing mismatch between the skill set of the unemployed and the skills required by employers (see, for summary, Banerjee et al, 2008).

When directly measured against one of GEAR's expected outcomes, it is also clear that foreign direct investment (FDI) was not high enough to fund employment creation (Hanival & Maia, 2008, p. 3). During the past twenty years South Africa has been relatively unsuccessful in attracting FDI compared to other similar developing countries. FDI inflows to South Africa were approximately 1.5% of GDP in the first decade of democracy while later peaks were mainly driven by large ad-hoc investments in the financial and communications sector (figure 6). Possible explanations for the low levels of FDI include the lack of skilled workers; poor transport infrastructure, high levels of crime which may deter investment, and inefficient spatial development plans that were inherited from the apartheid regime.

Figure 6: Net Foreign Direct Investment inflows (% of GDP) 1994 – 2014

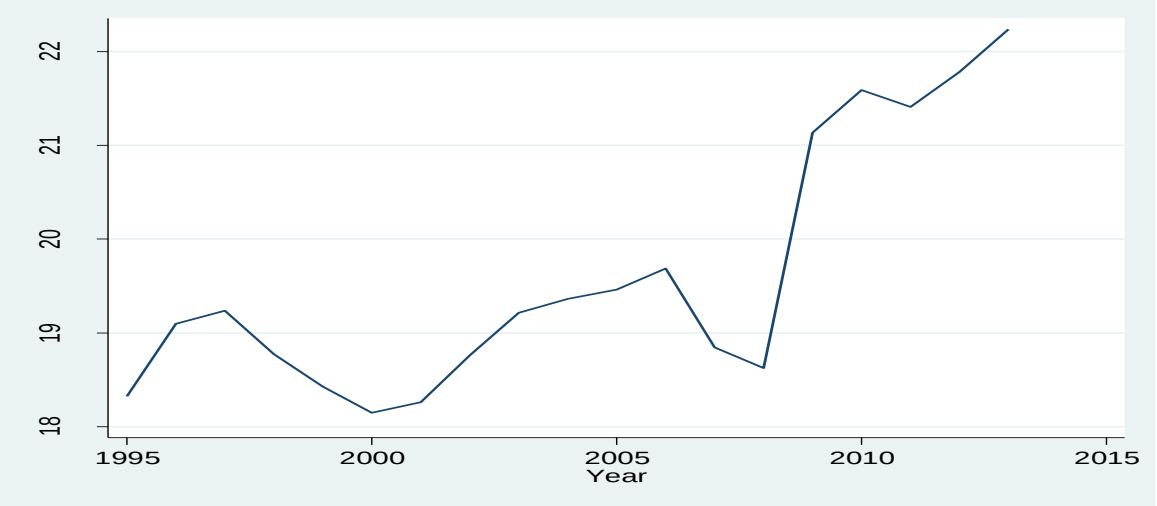


Source: Tradingeconomics, 2014

Note: Foreign direct investment; net inflows (% of GDP), are the net inflows of investment to acquire a lasting management interest (10 percent or more of voting stock) in an enterprise operating in an economy other than that of the investor. It is the sum of equity capital, reinvestment of earnings, other long-term capital, and short-term capital as shown in the balance of payments.

The lack of sufficient job creation to substantially reduce unemployment contributed to growing calls for the government to play a larger role in the economy through the notion of a 'developmental state' instead of merely pursuing economic growth and hoping that the trickle-down effect would be sufficient to address poverty and inequality. This signaled a clear break from the rationale that underpinned the GEAR strategy. This new role for the government is reflected in the increase in government spending after the 90s (figure 7). These goals were aligned with the Millennium Development Goals and were formulated in a new policy plan, the 'Accelerated Shared Growth Initiative South Africa' (ASGISA) (Reitzes, 2008).

Figure 7: Government spending (% of GDP) 1995 – 2014



Source: World Bank Development Indicator (http://data.worldbank.org/developers/apps/wbopendata)

While ASGISA laid out many short term goals, the most ambitious goal it set out to achieve was to halve poverty and unemployment by 2014.[8] This was based on a growth rate of 4% in the period of 2005-2009, and a growth rate of at least 6% from 2010-2014 – neither of which could be met[9].

Reiterating some of the promises made by the RDP with respect to small business, ASGISA hoped to develop the small business landscape through increased investment and the alleviation of barriers to growth of these firms.

In 2010 the newly elected president Jacob Zuma and his cabinet of ministers replaced ASGISA with the announcement of the New Growth Path (NGP). The NGP is an equally ambitious framework that aims to create 5 million jobs, and reduce unemployment by 10%[10] by the year 2020. To achieve these objectives the NGP plans to bolster education and training in South Africa through changes in subsidies and funding in order to enable the education and training of more engineers and artisans, and to invest more in FET (Further Education and Training) colleges and institutions that offer basic computer literacy courses (NGP, 2010).

[8] The ANC aimed to reduce the unemployment rate to beneath 15%.
[9] The recession that was experienced worldwide is partially to blame for this goal not being met. However, even despite this these hoped for growth rates are high relative to historical growth rates in South Africa.
[10] This would imply an unemployment rate of fewer than 15%.

In addition to attempting to increase skills in the economy, the NGP also aims to address the financing constraints which SMMEs supposedly face. On the 23rd of April 2012, The *Small Enterprise Finance Agency* was launched as part of the NGP's plan to bolster the SMME sector[11]. The agency promises to be a "one-stop-shop" for SMME financing by the consolidation of Khula, SAMAF, and IDC funding. The agency has access to R1.4bn, with plans to issue loans of up to R3 million to individual SMMEs (NGP, 2010).[12]

Other policies promised by the NGP include a "red tape elimination campaign", and a stance where government will ensure that its SMME suppliers are paid within a 30 day window. According to the research conducted by SBP in 2013, it appears that neither of these plans have come to fruition.

The NGP proposes a looser monetary policy and a more restrictive fiscal policy backed by microeconomic measures to contain inflationary pressures and enhance competitiveness[13]. It argues that monetary policy should continue to target stable and low inflation, however it should also aim to support a more competitive exchange rate and lower real interest rates (Kaplan, 2013). In the NGP these targets will be accompanied by larger purchases of foreign currency[14] in order to counter the appreciation of the rand. Furthermore, plans to negate the negative effects of short-term capital inflows should be considered, as well as methods to bolster competitiveness (NGP, 2010).

The NGP argues for a counter-cyclical fiscal stance throughout the business cycle in order to slow down inflation despite the looser monetary policy. Resources should be mobilized to finance growth priority areas in the economy, but the protection of public services[15]should remain a priority (Kaplan, 2013).

Early 2013 saw the introduction of the broader National Development Plan (NDP) as South Africa's long-term socio-economic development plan. The government views the NDP as a policy blueprint for eliminating poverty[16] and reducing inequality in South Africa by 2030. In order to address these socio-economic imbalances, the NDP identifies key constraints to faster growth, and consequently delivers

[11] With respect to the financing difficulties that SMMEs often suffer from.
[12]To date, there is no independently gathered data showcasing any result of how effective this funding may or may not have been.
[13] This is similar to the approach that was generated by GEAR.
[14] Foreign currency is being generated as a result of FDI and portfolio inflows.
[15] As laid out in previous policy plans.
[16] The NDP aims to reduce the proportion of households with a monthly income below R419 per person (in 2009 prices) from 39% to zero.

a "roadmap[17]" to a more inclusive economy. The NDP proposes a number of goals, and numerous milestone markers that will help identify if the goals are on their way to being met however, no succinct policy plan is offered as to how these goals and milestones will be achieved.

The restructuring and bolstering of the SMME environment as a whole is a key component of the NDP. The NDP is the first plan of its kind to recognize the need to disaggregate the different types of firms that fall within the SMME construct. Up until this point, all SMMEs have been treated similarly (Flowerday, 2013).

While the NDP may have correctly understood the importance of SMMEs to the South African economy, it is also equally likely that the NDP has overstated the impact that SMMEs can have. The plan has stated that by 2030 the share of SMMEs in South African output, ultimately allowing SMMEs to generate 90% of new jobs (Cosatu, 2014). In essence, the NDP's plans for improving the employment situation in South Africa are based on the notion that 9.9 million of the 11 million jobs[18] will be created by SMMEs (Cosatu, 2013). This claim has been based on the findings by Finscope during the period of 1998 to 2005, which showed that 90% of jobs in that period were generated by SMMEs[19].

The NDP also argues for labour market reforms in South Africa. This includes a youth wage subsidy, and a proposal for lowering all entry level wages based on the assertion that entry level wages in South Africa are too high. Many of these proposed reforms have been criticized by the Congress of South African Trade Unions (COSATU), although the youth wage subsidy, in the form of the Employment Tax Incentive, was implemented in 2014.

[17] This refers to a set of goals the NDP wishes to achieve, but no actual policy plans are mentioned.
[18] The NDP aims to increase jobs in South Africa from 13 million in 2010 to 24 million in 2030.
[19] Basing the claim on the findings of Finscope are problematic for a number of reasons. Firstly, the majority of the firms within the Finscope dataset can be consider survivalist enterprises, thus they only generated employment for the owner of the business, and not for additional workers. Secondly, the data utilized by Finscope has been shown by later empirical works to be statistically inconsistent, thus any findings based on results obtained by Finscope should be utilized very cautiously.

2.3 Labour market reform in post-Apartheid South Africa

The post-1994 period saw the introduction of a set of labour market reforms, through a suite of new labour regulations. These were rooted in the RDP principles of a more inclusive society with equal opportunities and the prevention of worker exploitation. These new labour regulations were driven by at least two forces. The first was the need to modernize the existing labour regulations and extend these to all participants in the labour market. This was particularly important since under apartheid, many fundamental rights for workers were not available to Blacks. The second was the role which organized labour played in the final years of apartheid and the negotiated transition to democracy. The Congress of South African Trade Unions (COSATU) was an active opponent of the apartheid system and played an important role in the negotiations surrounding the transition and the crafting of regulations during the early period of democracy.

The five main Acts (table 4) which were implemented during this period were: the Labour Relations Act (LRA) of 1995; the Basic Conditions of Employment Act (BCEA) of 1997; the Employment Equity Act (EEA) of 1998; the Skills Development Act (SDA) of 1998; and the Skills Development Levies Act (SDLA) of 1999. A sixth Act, the Unemployment Insurance Act (UIA) of 2001, sets out the conditions pertaining to unemployment insurance. The aim of these laws was to put in place a set of socially acceptable minimum standards of working conditions and to bring South African employment legislation into line with international standards (Black & Rankin, 1998).

Table 4: Aims and coverage of South African labour legislation

Name of Act	Key aims	Coverage
Labour Relations Act (1995)	Ensure orderly collective bargaining and workplace democracy Ensure effective labour market dispute resolution (CCMA)	All workers expect the defense force, secret services and essential services
Basic Conditions of Employment Act (1997)	Improve minimum rights for all workers Improve enforcement mechanisms	All workers expect the defense force, secret services and essential services, including part-time

	Role of Employment Conditions Commission to inform minister of labour	
Employment Equity Act (1998)	Eliminate unfair discrimination Ensure implementation of affirmative action	Employees in 'designated' firms (firms in excess of 50 employees)
Skills Development Act (1998)	Devise and implement national, sector and workplace strategies to improve skills of the workforce	Designated employers and sectors
Skills Development Levies Act (1999)	Collect funding for the National Skills Fund	All employers except the public service, religious and charity organizations
Unemployment Insurance Act (2001)	Provide protection to workers who become unemployed. Prescribe claiming unemployment benefits for unemployment, maternity benefits, illness benefits, adoption benefits and dependents' benefits.	All employers and workers (including domestic workers since 2003), except workers working less than 24 hours a month for an employer; learners; public servants; foreigners

Source: Leibbrandt et al (2010), Department of Labour (http://www.labour.gov.za/DOL/legislation/acts)

2.3.1. Wage bargaining process

The labour market reforms of the late 1990s and early 2000s introduced two types of institutionalized wage bargaining (table 5).

The first is sectoral determination. This covers a group of sectors where it is difficult for workers to organize and includes: farm workers; domestic servants; civil engineering; wholesale and retail; forestry; private security; the taxi industry and small business. In these sectors the Minister of Labour

sets minimum wages which are renewed periodically. The second are Bargaining Councils. Bargaining Councils cover collective bargaining at a sectoral, rather than firm or plant, level and are formed by representatives of businesses and workers in a specific sector. If a Bargaining Council represents the majority of workers and employers within a sector then agreements reached by that council can be extended to all participants in the sector, irrespective of whether they were party to such agreements, although a formal exemption can be applied for and granted by the Minister of Labour. In addition to these institutionalized processes bargaining can happen at a plant or firm level.

2.3.2. Recent amendments and trends in labour regulations

Almost twenty years after the introduction of the LRA, a set of amendments to the LRA were passed in 2014. These amendments focused primarily on how to treat part-time and contract workers and those employed through temporary employment services (or labour brokers). These amendments generally strengthen the position of those already in jobs and reduce the flexibility of firms in terms of hiring.

A further important development currently being debated in South Africa is the possibility of a national minimum wage. As discussed earlier, currently minimum wages cover certain vulnerable sectors, those covered by sectoral determination, and in other, but not all, sectors minimum wages, wages for certain job types, and working conditions are set by Bargaining Councils. During its election campaign in 2014 the ANC promised the possibility of a national minimum wage as a way to confront unemployment, poverty and inequality. This has been strongly backed by COSATU. In mid-2014 Parliament's Labour Committee began hearing submissions on the potential costs and benefits of a national minimum wage.

Table 5: Levels of bargaining in South Africa under the Labour Relations Act

Governed by statute	**Functions and Powers**	**Registration**
1. Bargaining Councils	Make and enforce collective agreements; Prevent and resolve labour disputes; Establish and manage a dispute resolution fund; Promote and establish training and education schemes; Establish and manage schemes or funds to benefit its parties or members; Make and submit proposals on policies and laws that affect a sector or area.	May be formed by one or more registered trade unions and one or more registered employers‟ organizations, given that these parties are “sufficiently representative”.
2. Statutory Councils	Resolve labour disputes; Promote and manage education and training schemes; Form and manage schemes or funds for the benefit of its parties or members; Make collective agreements; May perform any other bargaining council functions.	May be formed by a registered trade union or employers‟ organization which does not boast sufficient membership to meet the representivity requirement to form a bargaining council. Thus, registration is unilateral.
Outside of statute	**Functions and Powers**	**Description**
1. Plant or firm level bargaining	Bargain over issues otherwise covered by Bargaining or Statutory Councils.	Collective bargaining between an individual employer and the trade union(s) representing the employees of that particular employer.

2. Workplace forums	They promote the workers' interests by consulting and making joint decisions. Employers must provide relevant information to workplace forums. A workplace forum has the right to be consulted by the employer on: restructuring and new work methods; partial or total plant closure; mergers and ownership transfers; retrenching workers; job grading; criteria for merits and bonuses; education and training; product development plans; export promotions; health and safety measures.	Workplace forums may be formed when there are more than 100 workers by applying to the Commission for Conciliation, Mediation and Arbitration (CCMA)

Source: Leibbrandt et al, 2010

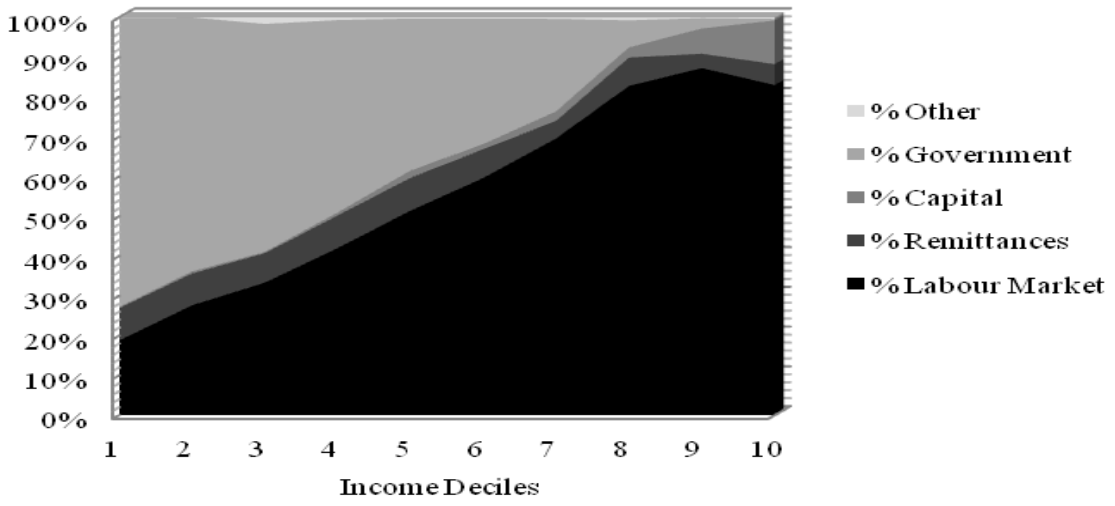
Box 3: Poverty, inequality, and social assistance

Overall, the redistributive policies of the South African government have been successful. Not only has the government managed to reduce overall poverty levels in South Africa since the early 1990s but also inequalities between races (Leibbrandt et al, 2011). Nevertheless, South Africa remains a

highly unequal society. While the Gini coefficient was at 0.65 in 1995, it only declined to 0.59 in 2013 (World Bank, 2014).

However, the decline in the Gini coefficient hides two important realities: the Gini coefficient based on labour market income alone is 0.77 and only due to fiscal redistribution does the coefficient decline to 0.59 (World Bank, 2014). Labour market income is the main driver of inequality in South Africa (figure 8) based on access to employment opportunities and the wage distribution across different skill levels, all of which are highly correlated with the socio-economic and educational backgrounds of labour market participants (Leibbrandt et al, 2010).

Figure 8: Income decomposition by decile (NIDS, 2008)



Source: Leibbrandt et al, 2010

The well-structured and targeted social grant system has increased the social wage of poorer South Africans over the last two decades. Besides better access to services (health and education as well as electricity, water and transport), social grants, especially the Old Age Grant, Disability Grand and the Child Support Grant, have reduced poverty levels with increasing numbers of poor household benefitting from these transfers (table 6). By 2013, almost 16[20] million South Africans received social

[20] Including Care Dependence, Foster Care, and Old War Veterans transfers.

assistance in form of transfers which account for 3.5% of South African GDP (National Treasury, 2013)

Table 6: Types of social grants and beneficiaries in South Africa in selected years

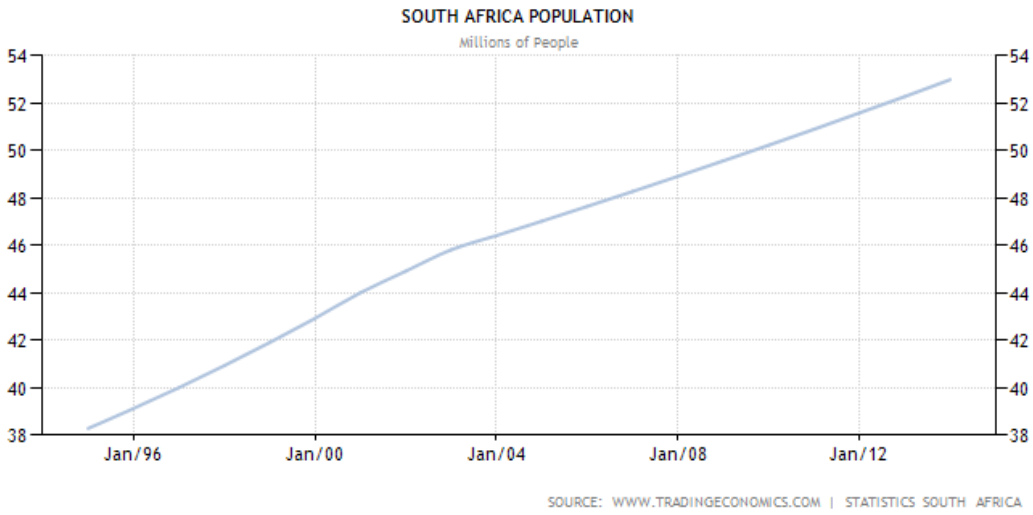
	1997	2009	2013
Old Age Grant	1 737 682	2 4141 83	2 846 000
Disability Grant	737 322	1 281 556	1 154 000
Child support Grant	362 631	8 825 824	11 213 000
Total	2 837 635	12 521 563	15 213 000

Sources: Van der Berg & Siebrits (2010) in Leibbrandt et al, 2011; Treasury Budget review, 2014

Although the impact of the South African social assistance programme on poverty alleviation has been impressive, extensive social welfare programmes like these could be fiscally unsustainable in the long run. However, some argue that (for instance, HSRC 2013, Sanlam 2013[21]) the current social assistance grant system is unlikely to represent a fiscal threat as grants have mainly increased to adjust for inflation only and no major extensions to other groups have been announced by government. In this case, only the trajectory of the economy and demographic changes will determine the sustainability of the social assistance program.

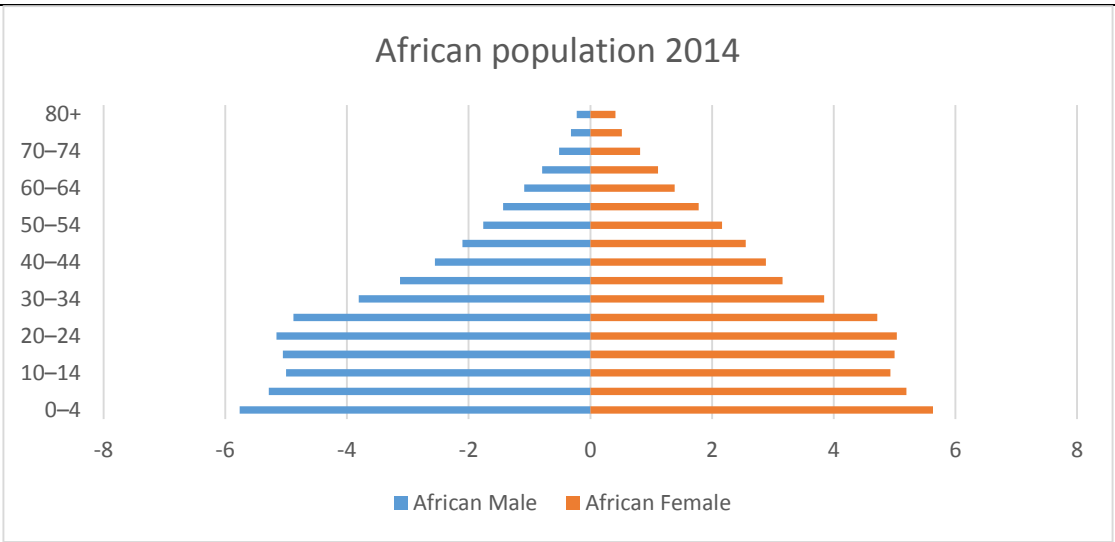
[21] See for instance: http://www.hsrc.ac.za/en/review/hsrc-review-november-2013/social-grants-fiscas or http://www.sanlam.co.za/wps/wcm/connect/sanlam_en/sanlam/investor+relations/economic+information/economic+commentary/the+sustainability+of+the+south+african+welfare+state

Figure 9: Total South African Population: 1994 – 2014



The South African population has increased at less than 2% annually (figure 9). While the South African population is relatively young (especially the African population) and therefore should place relatively little demands on old age grants in the medium term (figure 10), a large share of the African youth struggle to enter the labour market and contribute to the tax revenue base. Rather, there is an increasing number of African youth that is dependent on households that receive some kind of social assistance transfers (Leibbrandt et al, 2011).

Figure 10: Population pyramid: African population 2014



Source: StatsSA mid-year population estimates
(http://beta2.statssa.gov.za/publications/P0302/P03022014.pdf)

Irrespective of the potential dependence on income through grants, social assistance transfers do not necessarily have undesirable behavioural effects. While some studies show an incentive for young unemployed to attach themselves to households with access to social assistance and decrease search activity (Bertrand et al, 2003; Klasen and Woolard, 2008); an increasing number of studies identify positive impacts of residing in a household with access to social assistance on labour market behaviour, especially with regards to labour market participation and search activity (Posel et al, 2006; Sienaert, 2008; Eyal and Woolard 2011; Ardington et al, 2009). Furthermore, social assistance transfers do have a positive impact on health and educational outcomes for children residing in households that have access to these transfers (Case et al, 2005; Budlender and Woolard, 2006; Leibbrandt et al, 2010; Agüero et al, 2007; Duflo, 2003).

Irrespective of the overall positive impact of the social assistance program in South Africa, there is a general consensus that only an inclusive job creation growth path can guarantee lasting poverty reduction (Van der Berg and Sieberts, 2010; Treasury, 2013).

3. The South African economy and international trade

Although the post-Apartheid economy experienced overall economic growth as outlined above, this growth was not evenly distributed across sectors. Broadly, the composition of the South African economy has shifted away from tradable sectors (Agriculture, Mining and Manufacturing) towards non-tradable and service sectors, particularly Finance, Real Estate and Business services (FEB) (see table 7). Between 1995 and 2013 the share of the FEB sector in GDP rose from 17.4 percent to 24.2 percent. Overall the share of the tradable sectors in GDP declined from 32.3 percent to 24.9 percent over the same period with low growth (-0.1 percent per annum) in mining and quarrying sector the primary contributor towards this decline. While annual GDP growth rates in agriculture, forestry and fishing and manufacturing were higher (2.4 to 2.8 percent), their growth rates were still lower than aggregate growth in the economy. Consequently, these sectors also experienced declining shares in the economy. This is partly the outcome of South Africa's reintegration into the international community and its subsequent exposure to the global market.

Table 7: Share structure of real GDP in South Africa

	1995	2000	2005	2010	2013
Agriculture, forestry and fishing	2.6	3.0	2.7	2.5	2.4
Mining and quarrying	10.1	8.6	7.6	6.0	5.6
Manufacturing	19.6	19.2	18.5	17.2	16.9
Electricity, gas and water	2.6	2.5	2.4	2.1	1.9
Construction	2.5	2.3	2.8	3.5	3.4

Wholesale, retail and motor trade; catering and accommodation	13.1	14.0	13.9	13.7	14.0
Transport, storage and communication	7.5	8.9	10.0	10.2	10.1
Finance, real estate and business services	17.4	18.7	21.1	23.5	24.2
General government services	19.1	16.5	14.9	15.2	15.3
Personal services	6.4	6.5	6.3	6.2	6.1
Total value added at basic prices	100.0	100.0	100.0	100.0	100.0
Tradable sectors	32.3	30.8	28.7	25.7	24.9

Source: Own calculations using SARB data.

Tradable sectors include Agriculture, forestry and fishing, Manufacturing and Mining and quarrying.

3.1 Trade policy in post-Apartheid South Africa

As part of South Africa's post-Apartheid macroeconomic strategy, economic growth was to be driven by South Africa's reintroduction into the international community and its participation in the global economy. As such, the post-Apartheid period was characterized by a rapid increase in international trade following the reduction in import tariffs and the ending of sanctions. The South African economy had become increasingly isolated during the two decades prior to the ending of Apartheid and the 1990s heralded an important shift in South Africa's trade policy regime. The new post-Apartheid government adopted the multilateral trade liberalization programme negotiated during the Uruguay Round of the GATT/WTO. Restrictive trade and investment sanctions were also removed, exposing the economy to new international financial and trade flows (Evenett, 2002).

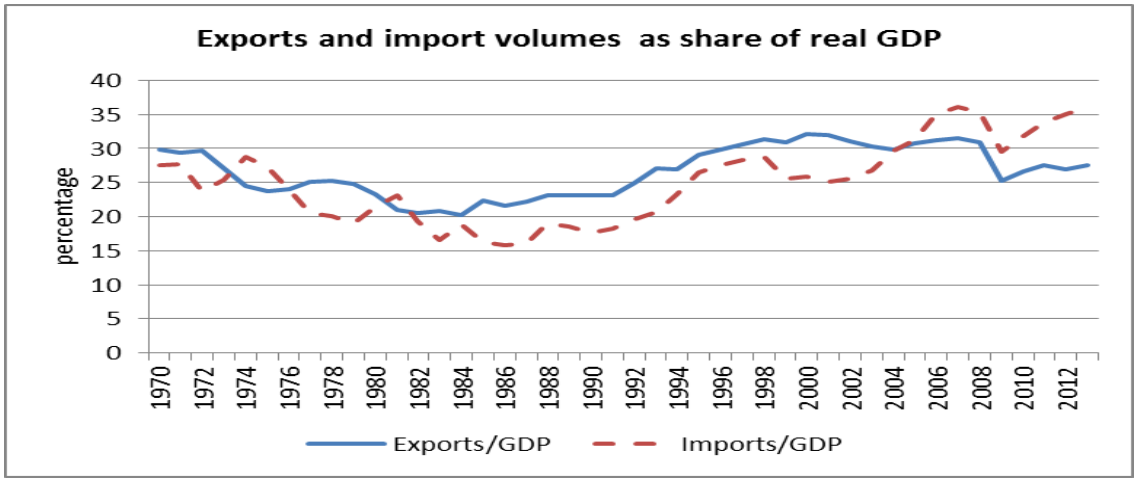
The trade reform programme led to the simplification of the tariff book as well as significant reductions in the levels of protection provided to domestic firms. The total number of tariff lines fell from over 13000 in 1990 to around 7800 in 1997 (Cassim et al., 2009). Transparency was improved through the increased use of ad valorem rates and reductions in the number of international tariff spikes (tariffs in excess of 15 per cent). Import weighted average tariffs fell from 21.4% (inclusive of import surcharges) in 1994 to 12.8% in 1999. Effective rates of protection fell from 42 percent to 15 percent over this

period (Edwards, 2005; Cassim *et al.*, 2009). Relatively large declines in protection (10 percent or more), were experienced in clothing, footwear, motor vehicle, coke products, other manufacturing and communication equipment, although protection rates remained in excess of 20 percent for many of these sectors (leather, textiles, motor vehicles, clothing, footwear and tobacco) (Cassim et al., 2009).

Multilateral trade reform ground to a halt by the late 1990s. Further trade reform was achieved through the implementation from 2000 of free trade agreements with the European Union (EU), the Southern African Development Community (SADC), and from 2007 with the European Free Trade Association (EFTA). By 2009, average protection on imports from SADC, EFTA and EU countries had fallen to 0.2%, 3.3% and 5.5% respectively.

The impact of these trade policies can be seen in Figure 11. Prior to trade liberalization, export and import volumes as a share of GDP were steadily falling. During the 1990s, growth in trade volumes exceeded GDP growth. Exports volumes rose as a share of GDP from around 20% in 1990 to 29% in 2000. Imports also rose as a share of GDP from 16% in 1990 to 24% in 2000.

Figure 11: Exports and import volumes as share real GDP



Source: Own calculations using SARB data.

Box 4: Geography and impact on economy

The geographic location of a country is an important determinant of its pattern of international trade. Distance from markets constitutes a sizeable component of overall trade costs (Anderson and Van Wincoop, 2004; Limao and Venables, 2001), which in turn affect the volume, type and range of products traded (Djankov et al, 2010). Standard gravity based models, for example, reveal that a one percent increase in bilateral distance reduces trade flows by between 0.5 and 1.5 percent, with this effect appearing to rise over time (Disdier and Head, 2008). High trade costs, including distance, also reduce the range of products exported, as well as the number of firms exporting to the destination (Bernard et al., 2007). Remoteness of markets also restricts participation by firms in global value chains. Consequently, remoteness has a relatively strong negative effect on exports of manufactured goods, as well as time-sensitive goods.

In addition to trade flows, a country's geographic location affects economic development through its effect on disease burden, agricultural productivity and the availability of natural resources (Bosker and Garretson, 2012). Further, the new economic geography literature has shown how geography of access to markets and sources of supply of intermediate goods is important in explaining cross-country variation in per capita income (Redding and Venables, 2004). Countries that face high transport costs face two penalties: Firstly, they pay higher costs in delivering their goods to the market. Secondly, they face higher costs in purchasing intermediate production inputs. These effects depress value added and consequently incomes. These effects have been shown to be an important determinant of observed differences in economic development between Sub-Saharan African countries (Bosker and Garretson, 2012).

The effect of geography on trade flows and economic development are particularly relevant for South Africa. South Africa, located on the southern tip of Africa, faces a number of challenges in accessing the international market. Firstly, it is distant from major production centers in the global economy. This affects manufacturing firms' abilities to integrate into global production networks. Secondly, the economy is distant from the major European, American and East Asian markets. These two effects are illustrated by two indicators – remoteness and market potential – presented in table 8 below. The market potential indicator is calculated as the inverse distance-weighted sum of

incomes in potential markets.[22] The closer a country is to large markets, the higher the market potential. The remoteness indicator is calculated as the GDP weighted average distance to markets.[23] The greater the value, the more distant an economy is from large markets.

Table 8: Market potential and remoteness, 2010

	Market potential (US$ bn)	Rank MA (/198)	Rank Remote (/198)
High income: OECD	20.7		
High income: non-OECD	11.5		
Low income	7.9		
Lower middle income	8.3		
Upper middle income	9.9		
Sub-Saharan Africa	7		
Selected upper middle income countries			
South Africa	4.9	189	181
China	8.4	108	123
Brazil	5.3	181	179

[22] Market potential for country *i* is calculated as $MP_i = \sum_j \frac{GDP_j}{D_{ij}}$ where GDP_j is foreign GDP (2005 constant US$ bill) and D_{ij} is bilateral distance between country *i* and *j*.

[23] Remoteness for country *i* is calculated as $REM_i = \sum_{i \neq j} D_{ij} (GDP_j / \sum_{k \neq i} GDP_k)$.

Malaysia	7.1	158	172
Turkey	13.9	43	42
Hungary	21.8	17	23

Source: Own calculations using bilateral distance obtained from CEPII and GDP (in constant 2005 US$) from World Development Indicators

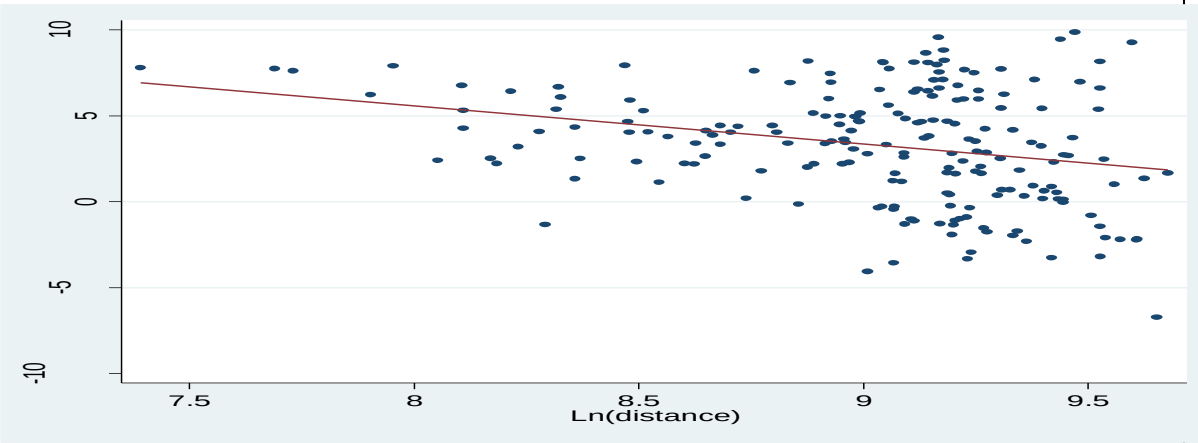
The table reveals a relatively low market potential for South Africa (4.9 US$ billion) compared to the average for upper middle income countries (9.9 US$ billion) and specific comparator countries such as China (8.4), Brazil (5.3), Turkey (13.9) and Hungary (21.8). Out of the 198 countries for which data are available, South Africa ranked 189 in terms of market potential.

South Africa is also distant from the major markets with a GDP weighted average distance of 11 124 km. This exceeds the average for upper-middle income countries (8 430 km) as well as the average for Sub-Saharan African economies (8 835 km).

The remoteness and market potential of South Africa play a considerable role in determining the level and product and geographic composition of South Africa's trade flows. To evaluate this further, we use detailed product level trade data for South Africa (6-digit level of the Harmonized System) and analyse the relationship between exports and the distance to markets.

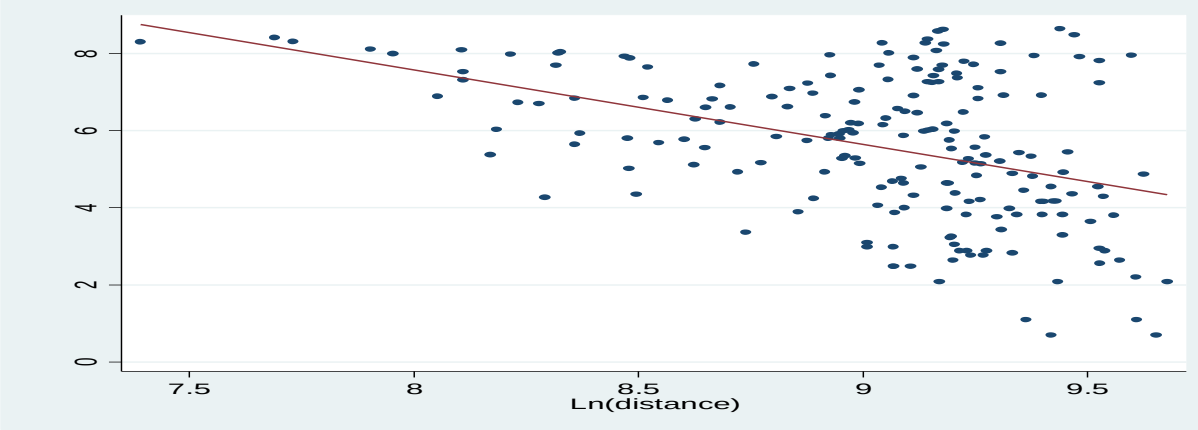
Figure 12 and 13 present scatter plots of the value and the number of products exported by South Africa against the distance to destination. In both case, a clear negative relationship is observed, although there is much variation around the trend line. The total value of exports as well as the range of products exported, falls sharply the further the market is from South Africa.

Figure 12: The value of products exported by South Africa against distance to destination



Source: Own calculations using trade data obtained from UNComtrade and bilateral distance from CEPII. The slope of the relationship is -1.5 (significant at 1% level)

Figure 13: The number of products exported by South Africa against distance to destination



Source: Own calculations using trade data obtained from UNComtrade and bilateral distance from CEPII.. The slope of the relationship in part (1) is -2.9 (significant at 1% level) and part (b) -2.7 (significant at 1% level). The number of products is calculated using 6-digit data classified according to the Harmonized System.

The sector composition of these exports is also affected. Manufactured goods are relatively dependent on access to imported intermediate inputs and integration into global value chains. It is therefore expected that manufactured goods are relatively disadvantaged by distance. In

Figure 14 and 15 plot the share of manufactured goods in the total value of exports as well as the total number of products exported against the distance to each destination. Once again a negative association is present. The share of manufacturing (value and number of products) in South African exports declines as the distance to the destination rises. Interestingly, we note very high shares of manufacturing in the value and number of products exported to nearby destinations. This reflects the importance of the Sub-Saharan African region as a destination of South African manufactured exports.

Finally, distance to markets also affects the spatial location of exports within South Africa. For example, Krugell and Naude (2005) show that regional exports in South Africa to the rest of the world are closely associated with foreign market access and proximity to the ports.

Figure 14: The share of manufacturing in exports value of products exported against distance to destination

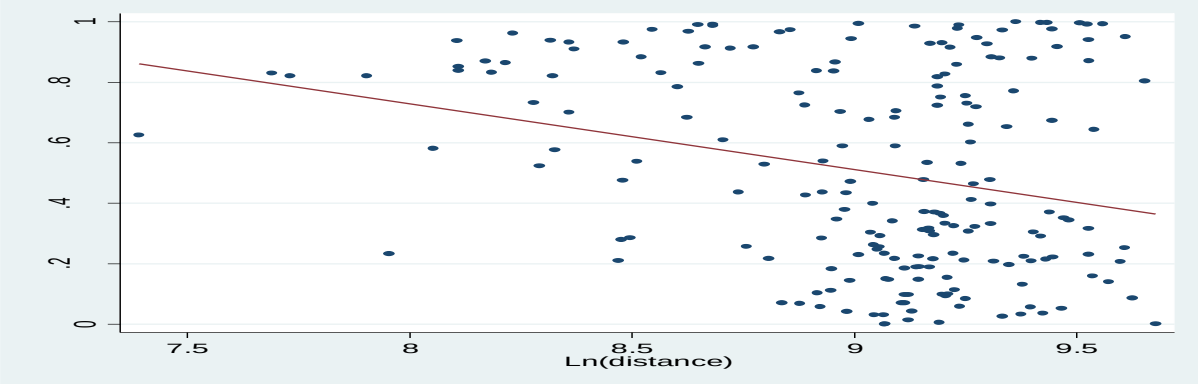
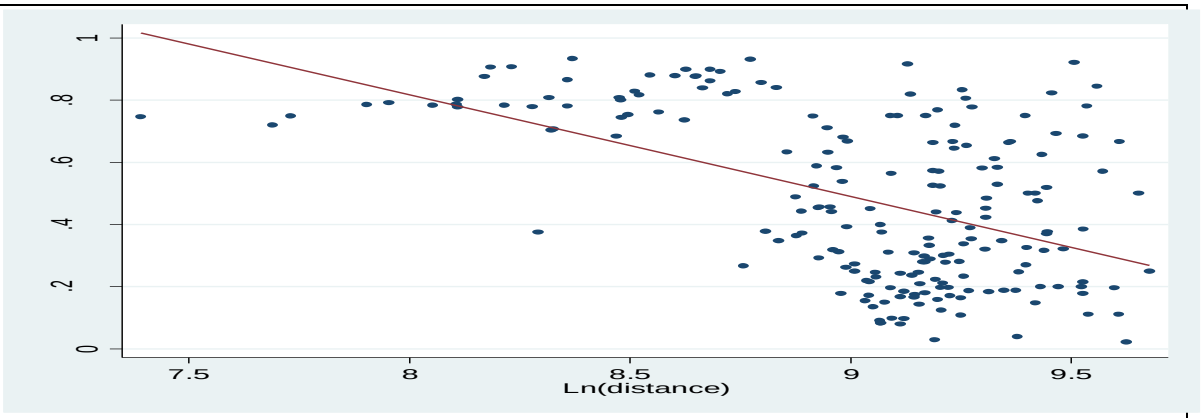


Figure 15: The share of manufacturing in exports number of products exported against distance to destination



Source: Own calculations using trade data obtained from UNComtrade and bilateral distance from CEPII.. The slope of the relationship in part (1) is -0.2 (significant at 1% level) and part (b) -0.3 (significant at 1% level). The number of products is calculated using 6-digit data classified according to the Harmonized System.

Since 2000, export growth has failed to keep pace with GDP and import growth despite the depreciation of the currency and the commodity boom. This resulted in an increased trade deficit that reached of 3.4 percent of GDP (basic prices) by 2008.

One driver of the trade deficit is the strong increase in import demand associated with the boom in economic growth from 2005 to 2007. The entry of China into the World Trade Organisation and the consequent increase in its exports to South Africa is another factor. Growth in South African exports was also mediocre and lagged behind other emerging economies and resource-based economies (Alves and Edwards, 2006) over this period. Importantly, volumes of exports in key export industries have remained stagnant. The volume of mining production, for example, has remained stagnant since 2000, despite the commodity boom.

3.2 Sector analysis of manufacturing trade

The composition of trade flows have changed considerably since the early 1990s (see tables 9 – 10). Historically South African exports have been strongly biased towards mining and resource based manufactures, reflecting the country's rich natural resource endowment. However, the liberalisation of the economy led to a rising share of sales exported across a broad range of industries. On aggregate,

manufacturing exports as a share of sales rose from 12.4 percent in 1995 to 23.7 percent in 2010, but increases were experienced in most 3-digit industry categories including resource based sectors such as basic iron and steel and non-ferrous metals, but also general purpose machinery, television, radio and other electronic equipment and motor vehicles.

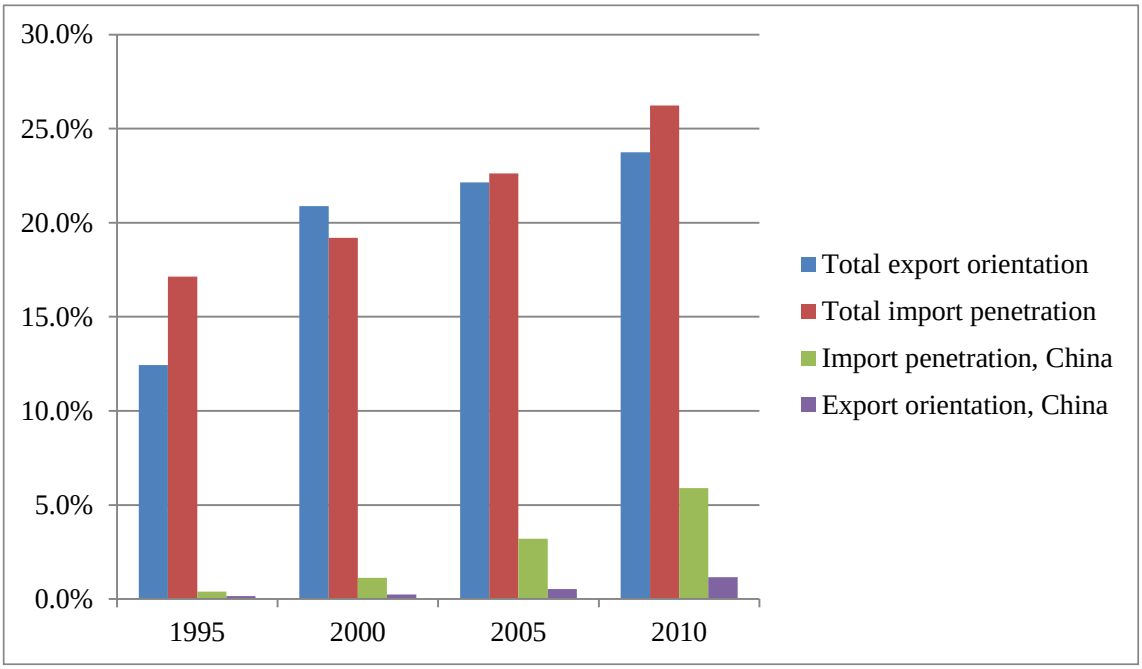
Some of the growth in exports is attributable to the reduction in the anti-export bias arising from lower tariffs (Edwards and Lawrence, 2008). Government incentives have also stimulated exports, particularly within the motor industry (under the Motor Industry Development Programme) and the clothing industry (under the Duty Credit Certificate Scheme).

Over the post-Apartheid period import growth has also risen strongly as a share of domestic consumption and relative to exports. Between 1993 and 2010 the share of imports in total domestic consumption of manufactures in South Africa rose from 14 to 26.2 percent (

Figure 16). As with exports, imports rose as a share of consumption across most industries. Relatively strong increases (30 percentage points or more) were experienced in the labour-intensive industries such as knitting and crocheted fabrics, clothing and footwear, as well as within the machinery and equipment and consumer electronics industries.

The broad period between 1995 and 2010 hides an important difference between the 1990s and the post-2000 period. After 2001, imports from China increased dramatically, rising from less than $1.1 billion in 2001 to $14.2 billion in 2011 (figure 16). Over this period, China rose from South Africa's 10th largest import partner for manufactured goods with a share of 2 per cent to its dominant source of imports with a share of 18.5 per cent by 2010 ahead of Germany, the United States of America and Japan (Edwards and Jenkins, 2013a). Over the same period exports to China increased from less than $0.5 billion to $12.4 billion.

Figure 16: Export-orientation and import-penetration in South African manufacturing



Source: Authors' calculations using UN Comtrade, Industrial Development Corporation (IDC) and Statistics South Africa data.

Notes: Total import penetration is calculated as the ratio of total imports to total consumption, with the latter calculated as total sales volume plus total imports minus total exports. Export orientation is calculated as the ratio of exports to total sales. Tobacco products are excluded as sales data are not provided by Statistics South Africa.

Table 11 reports the share of imports from China in total imports and in domestic consumption for 44 manufacturing industries in 1995, 2000, 2005 and 2010. In the mid-1990s, China dominated imports of goods within traditional labour-intensive industries, but by 2010 its dominance had also shifted to high-technology electronic and machinery sectors (Edwards and Jenkins, 2013).

All manufacturing industries in South Africa also experienced rising shares of Chinese manufactured goods in domestic consumption from 1995 to 2010. Particularly strong increases in Chinese import penetration occurred in knitted and crocheted fabrics (42.8 percentage points); footwear (40.1 percentage points); television, radio and other electronic equipment (30.3 percentage points); electric lamps and lighting equipment (27.5 percentage points); clothing (27.2 percentage points); and general purpose machinery (22.1 percentage points) industries.

Table 9: Total import penetration in South African manufacturing industries, 1995-2010

		Total import penetration (annual percentage)			
SIC	**Industry description**	**1995**	**2000**	**2005**	**2010**
301	Meat, fish, fruit, vegetables, oils & fat	15.6	15.0	15.7	20.3
302	Dairy products	2.4	4.0	3.8	4.3
303	Grain milling & animal feeds	4.7	6.8	8.2	10.1
304	Other food products	2.5	3.9	6.0	7.4
305	Beverages	3.6	4.5	4.7	5.8
311	Spinning and weaving	21.8	28.0	33.3	**41.7**
312	Other textiles	10.5	13.8	16.6	32.9
313	Knitted and crocheted fabrics	13.5	27.2	48.5	**63.2**
314/5	Clothing	3.7	11.4	24.7	37.7
316	Leather and leather products	22.2	33.6	28.3	39.0
317	Footwear	16.0	33.6	53.6	**59.7**
321	Sawmilling and planing of wood	15.6	19.1	17.9	13.2
322	Wood and wood products	6.2	9.5	9.3	8.4
323	Paper and paper products	10.8	11.4	12.2	15.3
324	Publishing	16.3	19.8	22.1	24.3
325	Printing and related services	0.7	0.9	1.0	1.0
331/2	Coke oven and petroleum products	2.1	7.3	15.0	25.9
334	Basic chemicals	32.1	39.7	42.5	42.6
335/6	Other chemicals	22.7	33.0	32.2	37.6
337	Rubber products	14.8	23.7	31.5	41.6
338	Plastic products	9.8	14.7	15.9	15.1

341	Glass and glass products	15.5	23.5	21.8	22.7
342	Non-metallic mineral products	8.9	14.5	13.3	16.2
351	Basic iron and steel	11.0	12.6	15.9	21.7
352	Non-ferrous metals	14.6	15.7	23.1	29.7
354	Structural steel products	1.1	2.1	2.8	8.4
355	Other fabricated metal products	13.0	16.9	18.6	22.1
356/59	General purpose machinery	45.3	62.4	73.5	**95.1**
357	Special purpose machinery	36.0	43.4	44.1	**62.0**
358	Household appliances	13.4	16.3	25.1	33.7
361	Electrical motors, generators and transformers	22.3	27.1	37.7	**46.6**
362	Electricity distribution and control apparatus	56.6	55.1	42.9	**51.7**
363	Insulated wire and cable	5.2	10.3	12.8	18.9
364	Accumulators and batteries	13.4	28.4	28.2	33.9
365	Electric lamps and lighting equipment	32.8	41.5	46.1	**51.1**
366	Other electrical equipment	25.9	25.2	32.9	31.2
371/2/3	Television, radio and other electronic equipment	62.6	82.7	88.2	**94.6**
374/5/6	Medical appliances, measuring and controling equipment	50.4	68.0	69.9	79.3
381	Motor vehicles	23.5	20.8	36.4	**50.1**
382	Bodies for motor vehicles	13.6	7.4	6.0	11.4
383	Parts and accessories for motor vehicles	20.0	10.5	13.1	17.7
384/5/6/7	Other transport equipment	34.1	56.6	75.5	**49.5**
391	Furniture	4.8	16.2	24.4	30.6
392	Other manufacturing	6.9	10.9	14.4	16.4

Total	17.1	19.2	22.6	26.2

Source: Authors' calculations using UN comtrade, IDC and Statistics SA data. The import penetration ratio is calculated as imports over domestic sales (domestic production less exports plus imports).

Table 10: Export orientation in South African manufacturing industries, 1995-2010

		Total export orientation (annual percentage)			
		1995	**2000**	**2005**	**2010**
301	Meat, fish, fruit, vegetables, oils & fat	17.0	18.0	14.1	14.7
302	Dairy products	2.4	2.9	1.4	2.8
303	Grain milling & animal feeds	2.1	2.4	4.6	3.7
304	Other food products	5.4	10.6	8.1	8.7
305	Beverages	9.3	13.0	13.7	13.1
311	Spinning and weaving	14.1	18.4	15.9	15.9
312	Other textiles	4.0	8.5	8.7	15.7
313	Knitted and crocheted fabrics	6.8	20.5	24.3	9.9
314/5	Clothing	4.9	10.7	5.2	4.4
316	Leather and leather products	29.4	43.0	20.9	19.2
317	Footwear	2.6	4.2	4.0	5.9
321	Sawmilling and planing of wood	19.4	34.3	35.5	26.7
322	Wood and wood products	7.8	12.1	7.6	3.8
323	Paper and paper products	20.6	23.0	16.5	20.0
324	Publishing	2.5	2.9	7.0	4.6

325/6	Printing and related services	0.3	1.2	0.9	0.7
331/2/3	Coke oven and petroleum products	2.2	23.7	18.6	12.0
334	Basic chemicals	34.0	38.5	44.4	**41.0**
335/6	Other chemicals	10.0	16.7	14.3	14.8
337	Rubber products	6.8	16.9	18.0	18.1
338	Plastic products	3.7	7.0	6.7	6.0
341	Glass and glass products	6.7	16.5	13.0	14.2
342	Non-metallic mineral products	4.8	7.3	6.7	5.2
351	Basic iron and steel	45.4	55.1	57.2	**61.6**
352	Non-ferrous metals	26.4	28.9	44.4	**48.2**
354	Structural steel products	7.1	13.3	11.9	17.8
355	Other fabricated metal products	6.5	10.9	11.0	13.5
356/59	General purpose machinery	13.6	44.3	56.4	**90.4**
357	Special purpose machinery	9.2	17.1	15.3	31.3
358	Household appliances	2.2	4.0	4.0	7.4
361	Electrical motors, generators and transformers	5.4	15.4	17.9	20.2
362	Electricity distribution and control apparatus	31.9	21.2	13.8	20.8
363	Insulated wire and cable	2.4	6.4	7.3	10.1
364	Accumulators and batteries	7.3	14.5	10.7	10.9
365	Electric lamps and lighting equipment	6.0	12.7	13.6	16.5
366	Other electrical equipment	7.3	18.1	18.1	13.8
371/2/3	Television, radio and other electronic equipment	13.2	36.7	46.5	**63.2**
374/5/6	Medical appliances, measuring and controling equipment	12.3	24.9	29.4	**42.9**
381	Motor vehicles	6.5	23.6	31.8	**52.2**

382	Bodies for motor vehicles	21.4	34.5	15.6	21.0
383	Parts and accessories for motor vehicles	7.7	11.9	10.7	12.6
384/5/6/7	Other transport equipment	14.9	35.2	53.7	18.3
391	Furniture	29.7	43.0	33.1	32.7
392	Other manufacturing	12.5	15.3	18.3	13.7
	Total	12.4	20.9	22.1	23.7

Notes: Export orientation is calculated as the ratio of export sales to total sales.

Key competition factor appears to be trade with China.

Table 11: Share of imports from China in total South African imports and domestic consumption, 2000-2010

		Share China in total SA imports (annual percentage)		**Import penetration from China (annual percentage)**	
SIC	**Industry description**	**2000**	**2010**	**2000**	**2010**
301	Meat, fish, fruit, vegetables, oils & fat	4.1	4.3	0.6	0.9
302	Dairy products	0.0	0.8	0.0	0.0
303	Grain milling & animal feeds	0.2	4.1	0.0	0.4
304	Other food products	0.5	4.0	0.0	0.3
305	Beverages	0.1	0.2	0.0	0.0
311	Spinning and weaving	10.1	43.5	2.8	18.2
312	Other textiles	12.1	38.2	1.7	12.6
313	Knitted and crocheted fabrics	13.8	66.7	3.7	42.2
314/5	Clothing	51.9	75.1	5.9	28.3
316	Leather and leather products	17.7	49.0	6.0	19.1
317	Footwear	40.6	76.8	13.7	45.8

321	Sawmilling and planing of wood	0.0	5.8	0.0	0.8
322	Wood and wood products	5.2	24.6	0.5	2.1
323	Paper and paper products	0.4	8.6	0.1	1.3
324	Publishing	0.9	5.7	0.2	1.4
325/6	Printing and related services	10.2	43.0	0.1	0.4
331/2	Coke oven and petroleum products	10.6	2.8	0.8	0.7
334	Basic chemicals	3.5	12.6	1.4	5.4
335/6	Other chemicals	1.7	7.2	0.6	2.7
337	Rubber products	2.5	23.1	0.6	9.6
338	Plastic products	7.7	22.3	1.1	3.4
341	Glass and glass products	6.7	38.6	1.6	8.8
342	Non-metallic mineral products	7.3	25.0	1.1	4.0
351	Basic iron and steel	3.6	16.4	0.5	3.6
352	Non-ferrous metals	2.3	9.4	0.4	2.8
354	Structural steel products	1.5	13.4	0.0	1.1
355	Other fabricated metal products	9.9	32.2	1.7	7.1
356/59	General purpose machinery	5.1	23.8	3.2	22.6
357	Special purpose machinery	1.5	17.8	0.7	11.0
358	Household appliances	17.8	62.6	2.9	21.1
361	Electrical motors, generators and transformers	6.2	23.4	1.7	10.9
362	Electricity distribution and control apparatus	1.8	12.8	1.0	6.6
363	Insulated wire and cable	4.2	24.1	0.4	4.6
364	Accumulators and batteries	5.9	28.0	1.7	9.5
365	Electric lamps and lighting equipment	21.2	59.9	8.8	30.6
366	Other electrical equipment	3.2	18.8	0.8	5.9

371/2/3	TV, radio and other electronic equipment	3.9	33.5	3.2	31.7
374/5/6	Medical, measuring and controlling equipment	2.8	9.6	1.9	7.7
381	Motor vehicles	0.1	3.0	0.0	1.5
382	Bodies for motor vehicles	0.7	32.6	0.1	3.7
383	Parts and accessories for motor vehicles	0.8	8.6	0.1	1.5
384/5/6/7	Other transport equipment	1.1	3.8	0.6	1.9
391	Furniture	6.1	48.1	1.0	14.7
392	Other manufacturing	21.3	48.7	2.3	8.0
	Total	4.9	18.5	1.1	5.9

Source:Edwards and Jenkins (2013) calculated using UN Comtrade, Industrial Development Corporation (IDC) and Statistics South Africa data.

Notes: Total import penetration is calculated as the ratio of total imports to total consumption, with the latter calculated as total domestic sales plus total imports minus total exports. Consumption here includes intermediate inputs and final demand. Tobacco products are excluded as sales data are not provided by Statistics South Africa.

3.3 Trade and deindustrialisation

The liberalization of the South African economy and the dramatic increase in import penetration has raised concerns about the deindustrialization effect this may have had (DTI, 2010). These concerns are clearly illustrated in

Figure 17-19. Since 1980, South African manufacturing has experienced a secular decline in its share of overall gross domestic product (GDP) and employment. The decline in manufacturing's share of employment appears to have accelerated from 1995 when the economy implemented its trade reform

programme. By 2010, manufacturing accounted for less than 13 percent of non-agricultural employment (from 19 percent in 1981).[24]

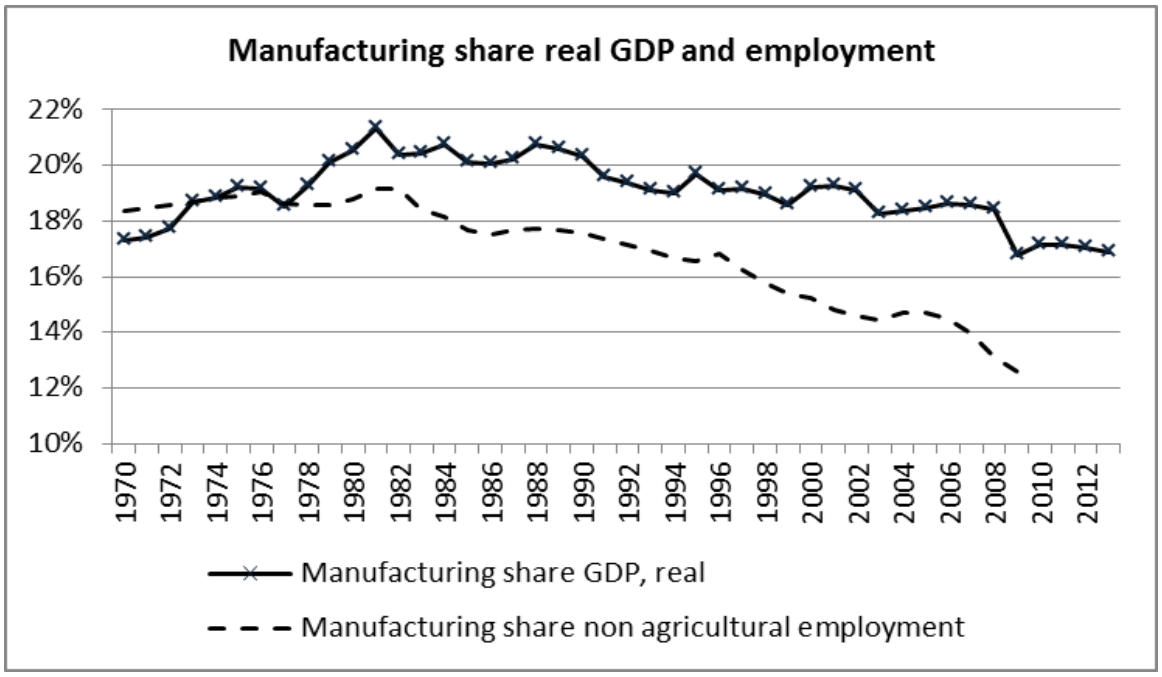
Structural changes also occurred within manufacturing. The skill-intensity of production has risen strongly in manufacturing relative to other sectors (Rodrik 2008). The share of semi and unskilled labour in manufacturing employment, for example, fell from 60 percent in 1980 (54 percent in 1990) to 49 percent in 2009. Across sector composition shifts associated with relatively large decreases in employment in labour intensive and semi-and unskilled intensive sectors (clothing, footwear, furniture) account for some of this decline. The dominant source, however, is a substitution towards skilled workers and capital *within* sectors pointing to the contributing role of skill-biased technological change (Bhorat and Hodge 1999; Edwards 2002; Rodrik 2008).

These structural changes have reduced the capacity of the South African economy to absorb labour, which in turn has contributed towards sustained high levels of unemployment in the post 1994 (Rodrik, 2008). The level of employment in manufacturing actually fell during the 1990s– from 1.5 million in 1990 to 1.26 million in 2001 (

Figure 17). A brief recovery in employment followed, but the downward trend continued from 2005 reaching less than 1.2 million workers by 2010. Semi and unskilled labour were disproportionately affected accounting for 65% of the decline in formal employment in manufacturing, despite only accounting for an average of 51 percent of manufacturing employment in this period. These trends placed manufacturing employment in 2010 at its lowest level in over 40 years.

[24] Evaluating manufacturing employment trends in South Africa is made difficult by the lack of consistently constructed data series. The employment series used here is constructed by merging the various manufacturing employment series obtained from Statistics South Africa.

Figure 17: Manufacturing share of GDP and employment

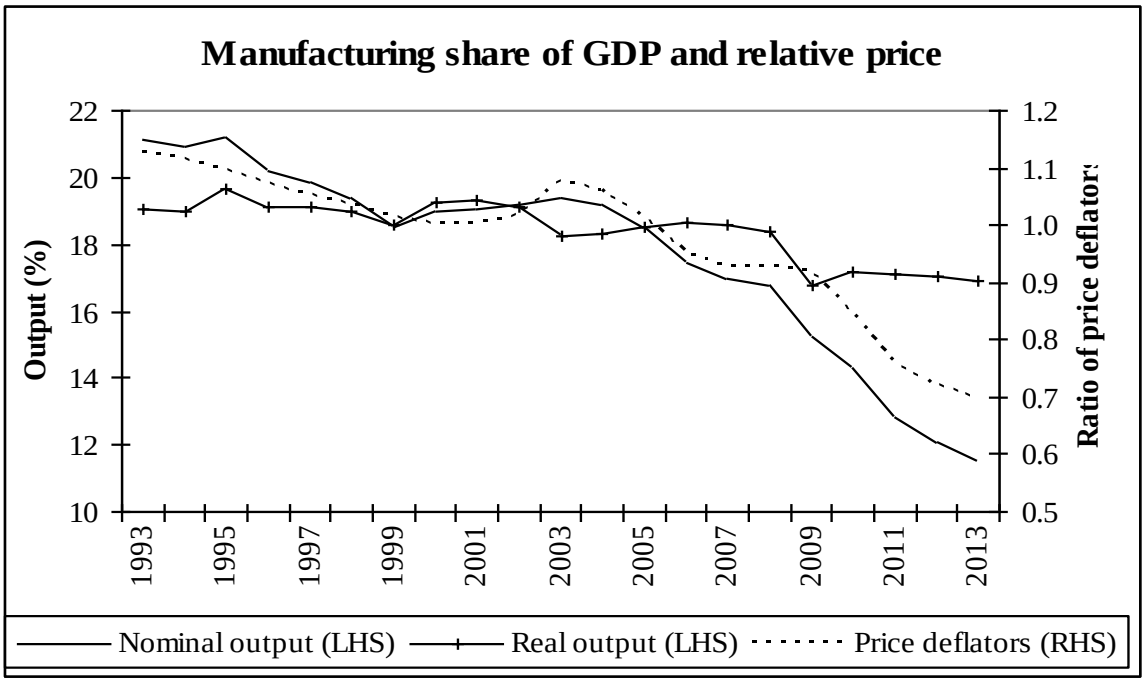


Source: Own calculations using data from South African Reserve Bank and Statistics South Africa data. The employment series from 1990 is constructed from Statistics South Africa data and only includes formal employment. See the data appendix for details on the construction of the employment series.

The determinants of the post-1994 patterns of structural change are widely debated. A key source is the decline in the relative profitability of manufacturing, as measured by TFP adjusted relative GDP deflators, which fell by 30 percent from 1990 to 2004 (Rodrik 2008). Regression estimates by Rodrik (2008) suggest that the decline in the relative price of manufacturing is the predominant cause of the decline in manufacturing employment (accounting for over 100 percent of the employment reduction between 1994 and 2004) with skill biased technological change the second most important contributor. Rodrik (2008) argues that tariff liberalization played a key role in the decline in relative profitability of manufacturing.[25] However, during this period there were also other changes in the South African economy, including changes in macroeconomic and monetary policy and the introduction of new regulations, including labour regulations, which may have played a role.

[25] A decomposition by Rodrik (2008) of his regression results indicate that import competition accounts for a quarter of decline in profitability, but around 4/5ths of this decline is offset by the real depreciation of the exchange rate. The remainder (85 percent of the change) is unexplained and captured by time trend.

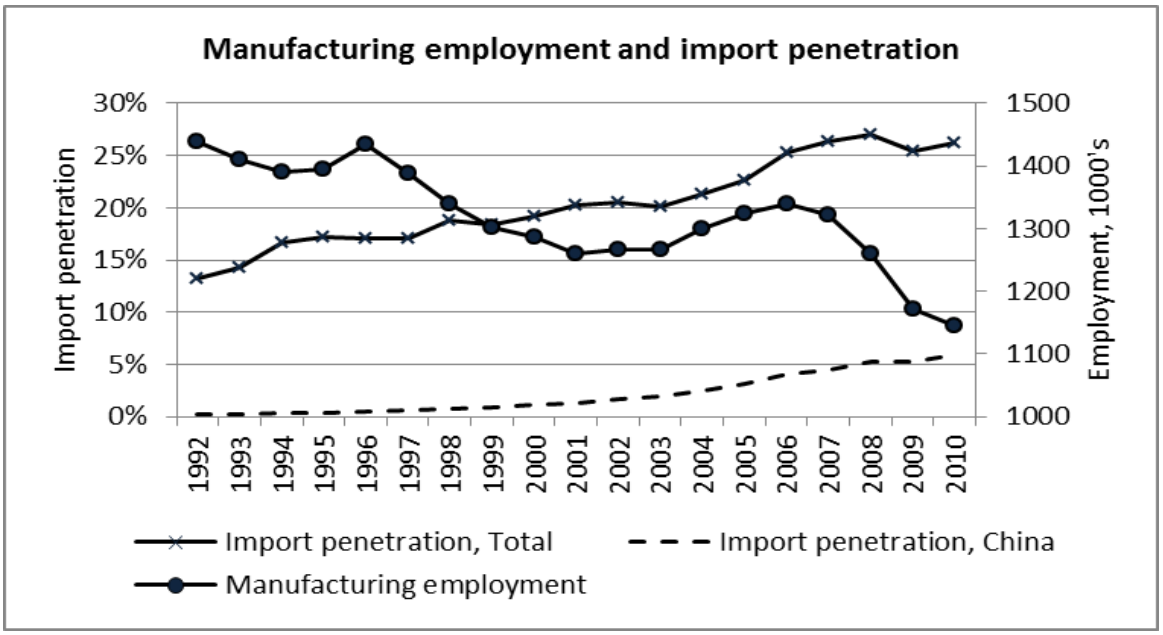
Figure 18: Manufacturing share of GDP and relative price of manufacturing value added to total GDP



Source: Own calculations using SARB data.

See file: PPI_SA_SIC_decompositionstudy_19Aug.xls

Figure 19: Manufacturing employment and import penetration



Source: Authors' own calculations using UN Comtrade and Statistics SA data. The import penetration ratio is calculated as imports over domestic sales (domestic production less exports plus imports).

3.4 Trade and employment

The trade data reveals considerable change within and between South African manufacturing industries in the post-Apartheid period. To evaluate the effect of these changes on output and employment, a Chenery-style (Chenery, 1960; Chenery *et al.*, 1962) decomposition is used to separate out the contributions of domestic demand, exports, import penetration and technology to changes in sales and employment.

Similar approaches have been widely used in the South African literature (Edwards, 2001a, 2001b, 2006; Dunne and Edwards, 2007; Jenkins, 2008; Edwards and Jenkins, 2013). In general, they find that rising import penetration reduced manufacturing employment during the 1990s, but these losses were almost entirely offset by growth in exports. Since 2000 with the growth of imports from China, net trade (exports – imports) appears to have reduced manufacturing employment (Edwards and Jenkins, 2013a).

These aggregate results hide important composition effects. In the 1990s, jobs were created through export growth within the natural resource-based and chemical sectors, while losses to import penetration occurred within labour-intensive and less skill-intensive sectors such as clothing, footwear and leather products (Edwards, 2006; Dunne and Edwards, 2007). Trade with China since 2001 has reinforced these trends (Edwards and Jenkins, 2013a). The structure of trade appears to have therefore shifted towards skilled labour.

These studies also reveal the dominance of within-industry changes in labour productivity in driving employment changes in South African manufacturing. However, rising labour productivity may in part be driven by firm responses to increased competition which cannot be unpacked at this aggregate level.

Lower priced imports of intermediate inputs can also stimulate production and demand for labour. Similarly, growth in exports raises demand for labour, but not necessarily all types of labour. Manufacturing exporters in South Africa tend to be relatively skill-intensive (Edwards et al. 2008). Growth in exports can thus feed into greater demand for skilled labour and rising skill premiums.

As such, decomposition studies are limited but still provide some insight into the relative importance of demand, trade and technology effects in driving output and employment changes within the economy. This decomposition approach is described in the appendix A and the results presented in the next section.

a) Sources of change in gross output

Table 11 presents changes in real output from 1993 to 2011 as a proportion of 1993 output values. Net trade made a positive contribution towards output growth in the period 1993 to 2011. Import penetration reduced real output by 20 percent, but this was more than offset by increases in exports. Looking across sectors, net exports of mining products as well as services contributed positively towards output growth.

Net exports of manufacturing also raised output growth, but important differences are evident across manufacturing industries. In capital-intensive industries (those industries with below median shares of labour remuneration in value added) output growth through exports exceeded losses due to rising

import penetration. In labour-intensive industries, net exports reduced output growth by 33 percent over the period.

Table 12 also aggregates important differences in the effect of trade on production pre-and post-2001. Edwards and Jenkins (2013), for example, find that net exports boosted manufacturing output (they do not take into account indirect effects) from 1992 to 2001, but reduced output from 2001 to 2010. The growth in imports from China accounted for the negative impact on production after 2001.

Table 12: Decomposition of output, 1993 to 2011 (Percentage change from 1993)

	Initial values (1993)	Growth in final demand	Import penetration in intermediates and FD	Exports	Net trade	Change in A coefficients	Total
Agriculture	103	75	-13	17	4	-24	56
Mining	213	20	-5	62	57	23	99
Manufacturing	818	81	-41	46	5	-5	81
Labour-intensive	*181*	*110*	*-64*	*31*	*-33*	*10*	*87*
Capital-intensive	*637*	*73*	*-35*	*50*	*15*	*-9*	*80*
Social overhead	241	113	-8	16	7	-39	81
Services	716	95	-13	39	26	56	178
Other G&S	449	153	-7	26	19	34	206
Total	**2538**	**96**	**-20**	**38**	**18**	**18**	**131**

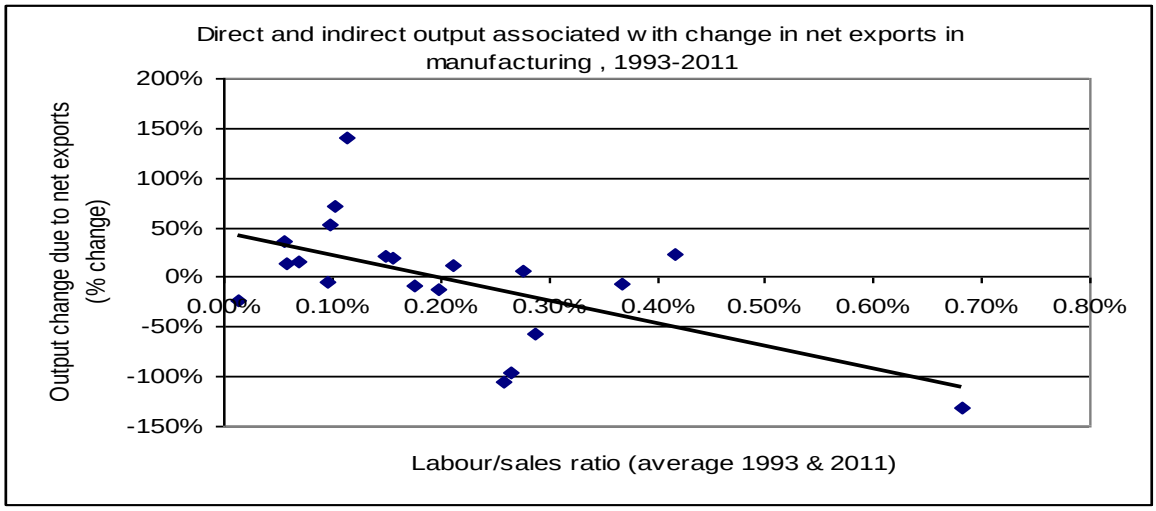
Source: Own calculations using Input-Output tables for 1993 and 2011 provided by Statistics SA

b) Sources of change in employment

The structural shifts in manufacturing output away from labour-intensive sectors associated with exports and imports suggests that international trade may have contributed towards a decline in manufacturing employment.

Figure 20 plots the contribution of net exports towards the change in output within manufacturing industries against the average ratio of employment to sales in 1993 and 2010. A negative relationship is evident (even once the outlier is removed), suggesting relatively large decreases in output from exports in labour-intensive sectors. Trade appears to have contributed towards structural shifts in production away from labour-intensive sectors.

Figure 20: Direct and indirect change in output associated with net exports in manufacturing industries, 1993 – 2011.



Source: Own calculations using Input-Output tables for 1993 and 2011 provided by Statistics SA

Drawing on the findings presented in table 13 and figures 21 and 22, the decomposition of employment changes from 1993 to 2011 (using equation 6 in appendix A) shows the following trends.

Overall, net trade in primary products, manufacturing and services had a positive impact on employment over the period, raising overall employment by 12 percent from 1993 to 2011 as employment losses through import penetration was more than compensated by employment growth through exports. The growth in employment from net trade was lower than the growth in output reflecting the bias of trade flows against labour-intensive industries shown earlier.

Nevertheless, when looking at individual sectors, the positive net trade impact on employment arises mainly from trade in mining and services sectors. For manufacturing, on the other hand, net trade reduced employment over the full period by 6 percent. This trend differed across manufacturing industries. The association between net exports and changes in employment across industries within manufacturing is clearly reflected by the negative slope of the scatter plot in figure 21. Net trade reduced employment in labour-intensive manufacturing industries by 31 percent, but raised employment in capital-intensive sectors by 18 percent. The decline in employment from net exports in labour-intensive sectors arises from relatively low increases in employment from exports combined with relatively high losses in employment from import penetration (figure 22).

Rising labour productivity, however, is the dominant source of change in employment over the period. Rising labour productivity is associated with a 87 percent decline in manufacturing employment, with final demand being the second most important source of change in employment over the period. Finally, while increases in the intermediate intensity of production contributed towards a 17 percent increase in total employment levels, it had a relatively marginal effect on employment in the manufacturing sector, increasing employment by only 2 percent.

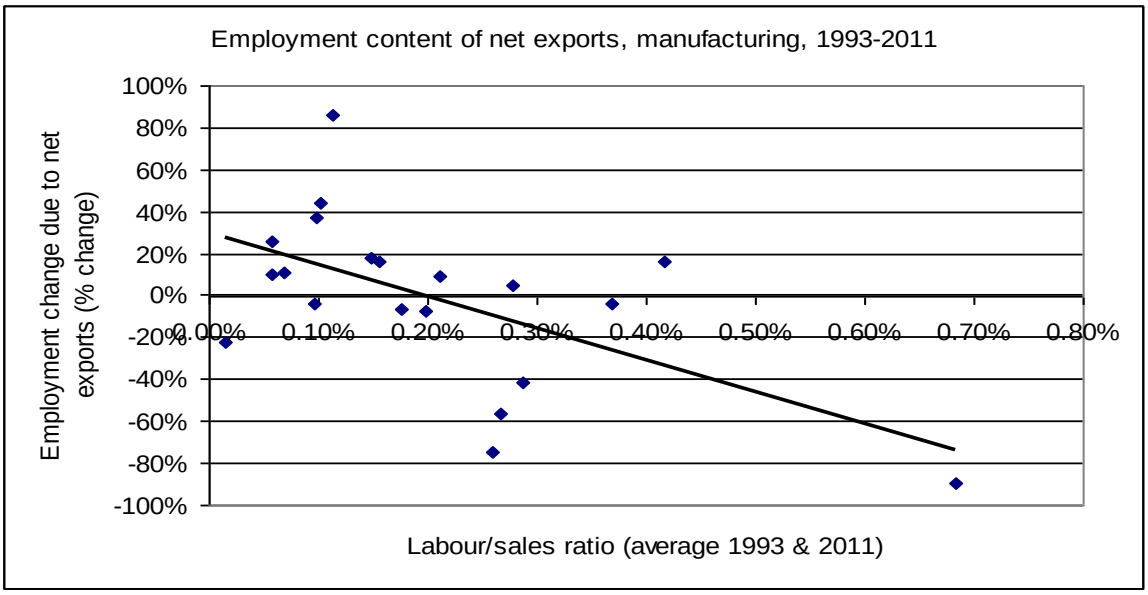
Table 13: Decomposition of changes in employment, 1993-2011 (Percentage change from 1993)

Table: Decomposition of Employment, 1993 to 2011(Percentage change from initial value)

	Initial values (1993)	Growth in final demand	Import penetration in intermediates and FD	Exports	Net trade	Change in A coefficients	Technology	Total
Agriculture	920	58	-10	13	3	-18	-57	-14
Mining	620	14	-3	43	39	16	-91	-22
Manufacturi	1410	73	-37	31	-6	2	-87	-19
Labour-intei	*702*	*85*	*-50*	*19*	*-31*	*8*	*-88*	*-26*
Capital-intei	*708*	*60*	*-24*	*42*	*18*	*-3*	*-87*	*-12*
Social overh	692	92	-3	6	3	-21	-103	-29
Services	2322	76	-10	31	21	44	-86	56
Other G&S	3243	104	-5	18	13	23	-131	9
Total	**9207**	**81**	**-11**	**23**	**12**	**17**	**-101**	**9**

Source: Own calculations using Input-Output tables for 1993 and 2011 provided by Statistics SA

Figure 21: Direct and indirect change in output associated with net exports in manufacturing industries, 1993 – 2011.



Source: Own calculations using Input-Output tables for 1993 and 2011 provided by Statistics SA

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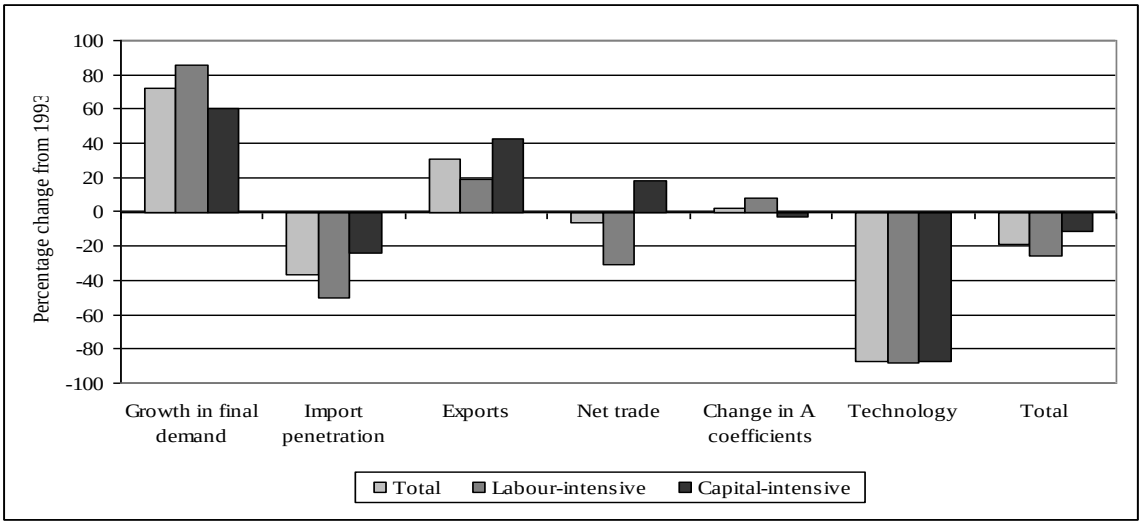
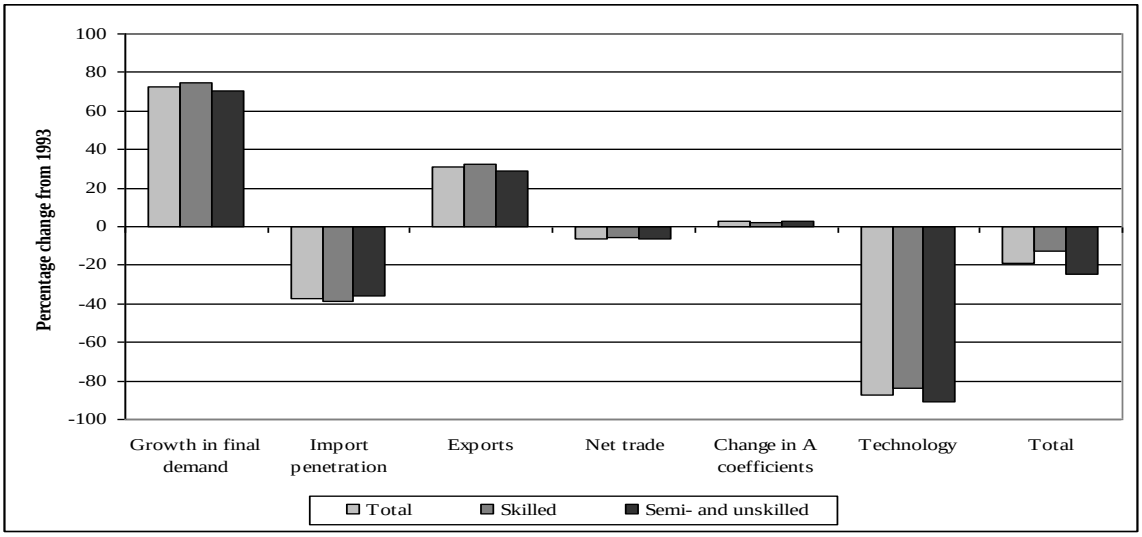
Figure 22: Decomposition of employment changes in manufacturing, by factor-intensity of production (1993-2011), Percentage change from 1993 values



Source: Own calculations using Input-Output tables for 1993 and 2011 provided by Statistics SA

Figure 23 plots the sources of manufacturing employment change according to skill. There are very few differences found across skill category with no substantial skill bias in the effect of net trade on demand for skilled labour relative to less-skilled labour. Export growth is marginally biased towards skilled labour, but this effect is offset by a slightly stronger effect of import penetration on skilled labour. Interestingly, labour productivity only has a slightly more negative effect on semi-and unskilled labour than on skilled labour. This result contrasts with that of Edwards (2001a) which suggested relatively large differential impacts across skills groups.

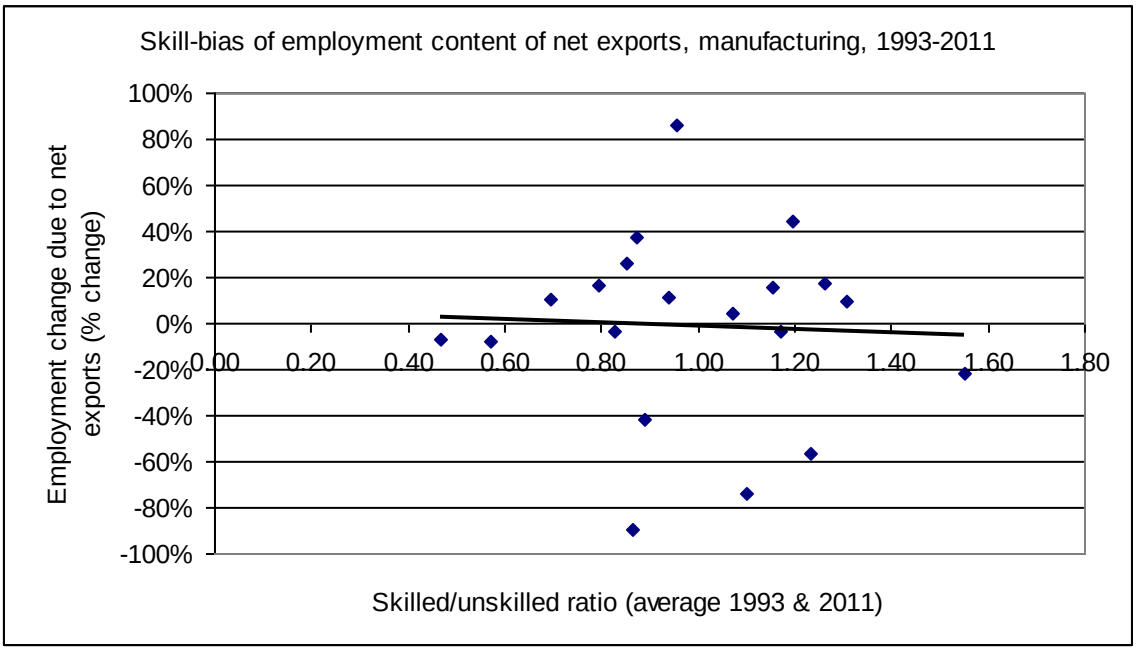
Figure 23: Decomposition of employment changes in manufacturing, by skill (1993-2011), Percentage change from 1993 values



Source: Own calculations using Input-Output tables for 1993 and 2011 provided by Statistics SA

Figure 24 below reinforces the lack of a skill bias of net trade on manufacturing employment. No association is found between the skill-intensity of production in manufacturing industries and the change in employment due to net exports.

Figure 24: Skill bias of net trade (1993-2011), Percentage change from 1993 values



Source: Own calculations using Input-Output tables for 1993 and 2011 provided by Statistics SA

We can conclude that South Africa's reintroduction into the global economy led to a shift away from labour-intensive production towards capital-intensive production. Trade affected these shifts mainly through increased import competition in labour intensive sectors. Furthermore, while an increase in labour productivity accounts for most of the loss in employment in the manufacturing sector, we cannot identify any skills bias.

Nevertheless, as mentioned above, these aggregate results hide important composition effects. Rising labour productivity may in part be driven by firm responses to increased competition through for example becoming more capital or skills intensive. Lower priced imports reduce the profitability of domestic import competing firms. These firms can respond by reducing margins (profit, markups) and sales and may even exit the market. Surviving firms may also respond by improving productivity through innovation, upgrading of technology, improvements in managerial efficiency and changes in product mix (Bloom et al. 2011; Wood, 1994). All of these changes affect the demand for labour, including the labour skills required.

The heterogeneity in firm responses to trade imply that the industry based studies are unable to identify the important firm composition effects that drive the within-industry changes in employment-intensity. In order to understand possible firm responses within sectors, we need to investigate firm level data. The following section presents general trends in (manufacturing) firm characteristics using four firm level survey that span from 1996 to 2008 (1996 Manufacturing Census and Large Sample Survey of 2001, 2005 and 2008).

4. South African manufacturing firms: characteristics and trends (1994 – 2014)

Firms that differ in characteristics are likely to adopt different production, employment and sales strategies when faced with changes in their environment driven by international trade or changes in the regulatory environment. Thus, there is significant heterogeneity in firm performances and dynamics as a response to the policy changes in South Africa during the post-Apartheid period.

Firm-level models of international trade such as Melitz (2003) relate firm performance to underlying firm productivity. In these types of models a change in transport or other costs which prevent firms from participating in the international market have an impact on the survival of firms and the composition of the population of firms, as well as the firm-size distribution and real wages. Such models also predict that only the most productive firms engage in exporting since these can overcome the costs of participating in the export market, such as transport costs, and still be competitive. It follows that a reduction in the productivity threshold required to participate in exporting, through for example reduced transport costs or tariffs, would result in an expansion of existing exporters and the entry into exporting of new firms further down the productivity distribution. At the same time, increased exposure to international trade drives out firms at the lower end of the productivity distribution through two mechanisms: the first is increased competition from foreign firms; the second is increased demand for resources by expanding domestic exporters. However, a key assumption of these models is that the economy is already at full employment.

Such models provide a useful framework for the analysis of South Africa's trade liberalization post-1994. They suggest that firms at the top end of the productivity distribution should have entered exporting, if they were not exporting, or increased exporting if they were already participating in the export market. At the same time lower productivity firms should have exited when faced with increased import competition, particularly with the rapid increase in Chinese imports in the 2000s. However, South Africa's labour market is very far from full-employment (at least amongst unskilled workers). Thus increased labour demand (for the unskilled) by these growing exporters should not have driven up real wages for this group. However, if the labour market is segmented, which work such as Behar (2010) suggests it is, then real wages in these other segments would have risen particularly if exporters demand higher-skilled individuals. There is evidence that South African exporters, particularly those exporting beyond the region, pay higher wages and employ more skilled individuals (Rankin and Schöer 2013). Thus expansion by firms in the top part of the productivity distribution could contribute to rising real wages for the more skilled. This seems to be the case – Wittenberg (2014) shows that real wages in the top half of the wage distribution, where higher skilled workers fall, have risen substantially since at least 2000; and Bhorat et al (2014) show that returns to highly-skilled occupational tasks (those defined ad analytical and ICT-related) have risen substantially too. In contrast demand for, and wages in, the types of jobs which can be outsourced or automated have fallen relative to other groups (Bhorat et al, 2014).

Whilst South Africa was liberalizing its trade in the mid to late 1990s it also embarked on labour market transformation through the introduction of a suite of new labour regulations. Research suggests that firms, particularly smaller firms, found these labour regulations onerous and these regulations constrained the growth of these types of firms (Rankin, 2006). Rankin (2006) also finds that costs of these new regulations fell most heavily on the unskilled.

Thus, during the late 1990s and early 2000s South African firms were dealing with two significant policy changes – substantial trade liberalization, and the subsequent rapid increase in China's participation in international trade; and a set of progressive labour laws which research suggests altered the incentives to hire, particularly unskilled, workers. Furthermore, institutionalized bargaining structures, such as Bargaining Councils and the introduction of minimum wages in certain sectors in the early 2000s, are likely to have reduced the ability of South African firms to respond to increased import competition through more flexible, or lower, wages. In this scenario firms which faced import competition but where constrained in the wages they could pay would have had three choices: become more productive; choose a more capital, skills or intermediate input intensive production technology; or go out of business. Given that the labour regulations were most biding on smaller firms and those with higher labour-intensity then these changes should be more apparent amongst these types of firms. We would thus anticipate:

a) That general productivity increases are largest amongst the smaller firms. This may be due to a compositional effect of less efficient firms exiting or due to within firm increases in productivity;
b) Higher relative increases in capital, skill or intermediate input intensity amongst the smaller firms;
c) Higher exit rates of smaller firms and a decreasing share of employment in small firms in the economy.

All these effects are likely to be stronger in sectors where labour regulations, and wage setting is the least flexible. These would be sectors such as those covered by Bargaining Councils or those tradable sectors which are covered by minimum wages.

The following section provides an overview of firm characteristics and dynamics for firms that have been producing in the South African economy environment.

Most work on the South African labour market has focused on the supply-side due to the availability of regular labour market surveys collected by Statistics South Africa (StatsSA). Research on firm-level labour demand has been limited by the availability of consistent firm-level data. Much of the firm-level data available to researchers is based on, often ad-hoc, cross-sectional surveys. Of these it is only the World Bank's Investment Climate Surveys of 2003 and 2008 which has a panel dimension, although this is relatively small. The regular data collected from firms by StatsSA has not generally been available to researchers, although studies such as Kerr, Wittenberg, and Arrow (2014), which uses the Quarterly Employment Survey – a firm-level survey of employment – are now becoming more common.

a) South African firms in international markets

South African exporting firms share similar characteristics to exporters in other countries. A number of studies, using different datasets have shown that they are larger than non-exporters, generally have higher levels of labour productivity and pay higher wages (Rankin, 2001; Edwards, Rankin and Schöer, 2008; Matthee and Krugell, 2012; and Naughtin, 2014). Table 4 below presents results from the most recent research which uses Statistics South Africa's Large Sample Survey (LSS) of manufacturing to examine the export premium across a number of dimensions (Naughtin, 2014). The data covers two years – 2005 and 2008. These results are derived from an Ordinary Least Squares regression of the following specification:

$$\ln Y_{it} = \alpha + \beta_1 time_t + \beta_2 export_{it} + \beta_3 time_t \times export_{it} + \gamma\, characteristics_{it} + \phi_j + \varepsilon_{it}$$

where Y is the outcome variable of interest, *time* is a dummy variable which takes a value of 1 in 2008, *export* is a dummy variable for whether a firm exports in a given year, *characteristics* are firm-level characteristics such as size, and ϕ is an industry level fixed effect. The subscript i denotes firms, j industries and t time. β_2 indicates whether exporters are different from non-exporters in general and β_3 indicates whether this difference differs between 2005 and 2008.

This data shows that exporters are much larger than non-exporters, between 75 and 100 per cent larger in terms of output and 50 to 90 per cent larger in terms of employment. They also have higher output per worker (16-18 per cent), pay more (23-36 per cent) and are more capital- and intermediate input intensive (43-70 per cent and 25 per cent respectively). These differences are not due to differences across industries since these are controlled for. Neither are they due to the fact that exporters are larger than non-exporters – the lower panel of the table shows these results once firm size is controlled for. This data does not identify the destination of exports but other work indicates that the market which firms sell to matters. Exporting to higher income countries outside the region is associated with higher wages and total factor productivity (Rankin, 2001; Rankin and Schöer, 2013).

Table 14: Characteristics of Exporting Firms

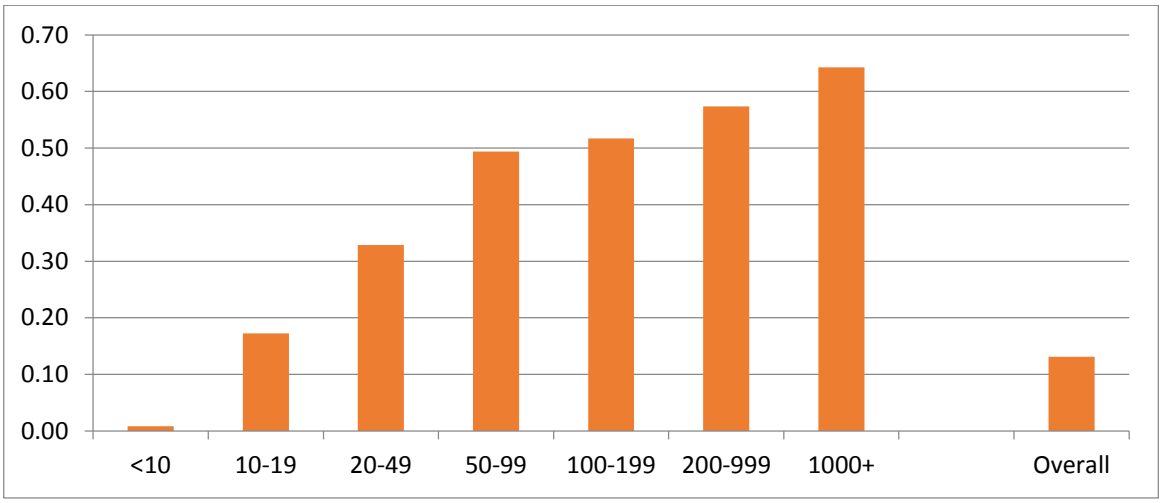
	Sales	Total employment	Output per employee	Average wages	Capital per employee	Intermediate inputs per employee
Controlling for Industry (SIC3)						

2008 dummy	-0.152***	-0.0667**	-0.0276	0.212***	-0.143***	-0.117***
Export dummy	0.738***	0.635***	0.164***	0.311***	0.358***	0.227***
2008 × export dummy	-0.187***	-0.222***	-0.00796	-0.108***	0.167***	-0.00909
Observations	*9,561*	*9,950*	*9,514*	*9,945*	*9,770*	*9,945*
Controlling for Industry (SIC3) and Firm size						
2008 dummy			-0.0322	0.213***	-0.135***	-0.119***
Export dummy			0.186***	0.302***	0.291***	0.245***
2008 × export dummy			-0.0150	-0.105***	0.190***	-0.0154
Observations			*9,514*	*9,945*	*9,770*	*9,945*

Notes: ***p<0.01,**p<0.05,*p<0.1 is significance at the 1% level, 5% level and 10% level respectively Values for sales, employment, output per employee, average wage, capital per employee, and intermediate inputs per employee are given in natural logarithms and are real values.

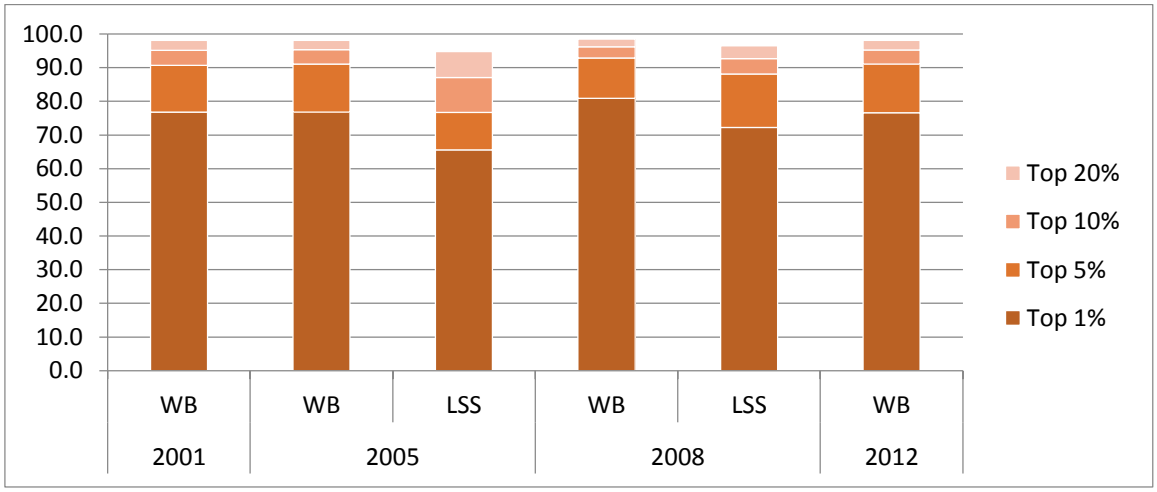
In addition to being different, exporters are relatively rare. Overall only 13 per cent of manufacturing firms export and those that do only export very little of their output - less than half of firms export more than 10% of their output (Farole, Naughtin and Rankin, 2014). Not only is exporting a rare occurrence but even within exporters, a very small number of firms produce the bulk of South Africa export value. Figure 26 shows that in manufacturing the top 5 per cent of largest exporting firms produce between 75 and 95 per cent of total export value. In absolute numbers this is very small – Farole et al (2014) estimate that this was a total of about 200 firms in 2008. The top 1 percent of exporters which produced 65 per cent of export value in 2005 and numbered 21 firms. This high level of export concentration is not just the case in the manufacturing sector. The World Bank's Export Dynamics Dataset shows high levels across the economy as a whole and that South Africa has one of the most concentrated export sectors (World Bank, 2014)

Figure 25: The proportion of firms exporting by size (2008 LSS)



Source:Farole, Naughtin and Rankin (2014)

Figure 26: Export concentration in South African manufacturing



Source: Farole, Naughtin and Rankin (2014)

Notes: WB is the World Bank's Export Dynamics Database; LSS is Statistics South Africa's Large Sample Survey of Manufacturing. Top *x*% refers to the *x*% of exporters which have the largest export value. These categories exclude other categories (for example Top 5% is for the top 1-5% of exporters).

Although participation in the international market as a way to grow the economy and create jobs has been one of the key tenets of South Africa's strategic economic vision, most recently embodied in the National Development Plan, government support for exporting is relatively limited. The most

significant government programme to develop and support exporters is the Export Market and Investment Assistance (EMIA) programme which is administered by the Department of Trade and Industry (dti). The EMIA partially compensates exporters for the costs which they incur in developing export markets. The types of assistance it provides includes the transportation of samples; the renting of exhibition space; the construction of stands; interpretation fees; internet connections; telephone installations; a subsistence allowance per day; return economy-class airfares; and exhibition fees (The dti, 2013).

Exporting directly is not the only way to integrate into global value chains; a second way is to provide intermediate inputs to other domestic firms which do export. However Edwards and Rankin (2014) argue that South Africa is missing a group of intermediate input producers, particularly smaller and medium firms, and that the population of South African manufacturing firms is missing a 'bottom' of small firms which could produce intermediate inputs. This suggests that South Africa firms are not well integrated into the global market through domestic relationships.

b) Labour market legislation as a constraint to employment

South Africa introduced a suite of progressive labour market regulations in the late 1990s and early 2000s. Descriptive evidence by Rankin (2006) suggests that the costs of these laws fell disproportionally on smaller firms and the unskilled workers. Cross-country comparisons of labour regulations, such as the Global Competitiveness Report (World Economic Forum, 2014), suggest that South Africa's are amongst the most rigid in the world. Although these comparisons often rely on the perceptions of executives, other comparisons based on more objective measures (such as Bhorat and Cheadle, 2009) indicate that certain aspects of these regulations, such as the rigidity of hiring and firing regulations, are more restrictive than the world average and above South Africa's peer-group of upper-middle income countries. Bhorat and Cheadle (2009) also find that these regulations seem to have become more onerous over the period between 1997 and 2006, and recent amendments to the Labour Regulations Act are likely to continue this trend. Bhorat and Cheadle (2009) also suggest that lack of capacity and inefficiencies in South African labour market institutions such as the Labour Courts and the Commission for Conciliation, Mediation and Arbitration (CCMA) may mean that *de facto* labour market regulations may be more onerous than how they appear in the legislation.

This set of new regulations created two types of institutionalized wage setting mechanisms in South Africa – sectoral determination bargaining councils. Bhorat et al (2013) conduct a review of the impact of the implementation of these minimum wages through sectoral determination across sectors and find that wages of unskilled workers improved in all sectors where these were implemented, but it was only in agriculture where there were large employment losses. However, one critical distinction between agriculture and all the other sectors where sectoral determination exists (except forestry) is

that agriculture is a tradable sector where it is possible to substitute capital for labour either directly or by changing the types of crops which are grown. In contrast the other sectors are all service sectors which are not tradable and where there is generally less opportunity for substitution of labour.

The second, and more controversial, wage setting structure entrenched by the Labour Relations Act are Bargaining Councils. These developed out of apartheid-era Industrial Councils and are formed by representatives of business and labour in a certain industry or sector and geographical region. If these Bargaining Councils (BCs) are sufficiently representative of the sector, usually meaning there members employ the majority of workers in the sector (50 per cent plus one), then the decisions of these BCs are extended to other businesses in the sector which were not party to the negotiations and agreement. In general large firms within a sector are disproportionally represented on BCs, since relatively few larger firms can employ enough workers to be representative of the sector. This means that decisions taken by these BCs, and extended to other non-party firms with the sector, are likely to more closely reflect the wishes of larger businesses and the workers within these businesses. Moll (1996) was one of the first to show that this extension would lead to some smaller and medium firms going out of business and create the incentive for surviving firms in these size classes to become more capital intensive. More recently, Magruder (2012) found that Bargaining Councils decrease employment in an industry by 8–13 percent, and these losses are concentrated among small firms. Nascent research by Edwards, Rankin and Stijns (2014) also finds that smaller firms in sectors covered by BCs which face increased levels of imports are more likely to exit than larger firms or firms which are not covered by a BC.

One way which it seems South African firms have responded to the changing labour market has been through the increased use of Temporary Employment Service (TES) firms, or labour brokers (Bhorat and Van Der Westhuizen 2013). This type of arrangement means that firms do not have to employ workers directly and thus have increased flexibility in hiring and firing. However, the amendments to the Labour Relations Act introduced in 2014 attempt to tighten up on the conditions of employment under TES firms.

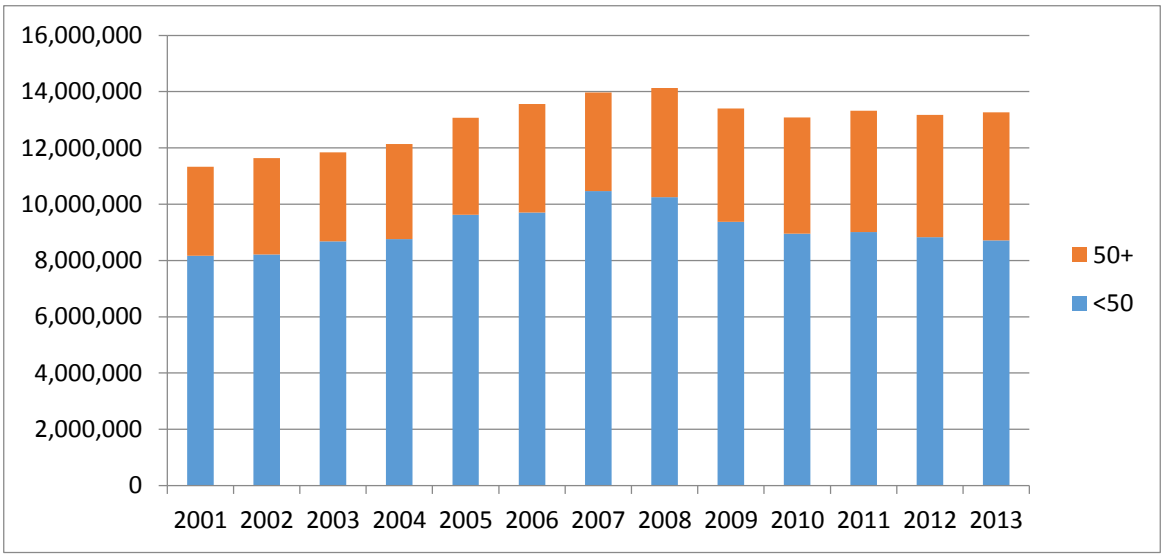
c) The firm size distribution in South Africa

South Africa seems to be missing a group of smaller firms. Table 15 shows that relative to a number of other countries South Africa has a much larger share of employment in larger firms. Magruder (2012) also provides evidence of this from other sources. Furthermore, the share of employment in smaller firms seems to be declining. (Kerr, Wittenberg, and Arrow 2014), who use data from Statistics South Africa's Quarterly Employment Survey (QES) of firms, find that over the period 2005 to 2011 net job creation was negative on average in firms smaller than 500 employees, although their data may

undercount firm births. These trends are supported by recent trends in employment estimated from the Quarterly Labour Force Survey (QLFS).

Figure 27 shows the number of firms that employ 50 or more workers compared to firms that employ up to 50 workers. Between 2008 and 2013 the absolute number of people employed in firms with 50 or fewer workers dropped by approximately 1.5 million. This was approximately balanced by the creation of jobs in firms with more than 50 workers, including government. Although this period corresponds with lower South African growth rates and negative employment growth for a period brought on by the Global Financial Crisis the magnitude of these job losses are staggering and employment levels in smaller firms have been approximately constant since 2010 when overall employment growth resumed. Furthermore, these job losses are not simply the loss of informal jobs or jobs in informal firms. Confining employment to only formal jobs and firms suggests a similar magnitude of job loss in smaller firms.

Figure 27: Employment levels and firm size



Source: LFS, QLFS datasets; own calculations

Table 15: Distribution of the number of firms and employment

		Distribution of number of firms (percent)			Distribution of employment (percent)		
		10-49	50-99	100+	10-49	50-99	100+
South Africa	2005	65.9	14.1	20.0	12.6	8.3	79.1
	2008	60.4	20.7	18.9	13.8	12.8	73.4
Argentina	1993	78.5	15.4	6.2	31.6	24.3	44.1
Bolivia	1992	82.9	9.9	7.2	41.7	17.5	40.8
Chile	2006	61.1	17.3	21.7	14.6	12.3	73.1
Colombia	1998	60.3	18.2	21.5	15.6	14.5	69.9
Ecuador	2005	61.5	16	22.5	12.8	10.2	77.1
El Salvador	2005	70.2	14.3	15.5	21.5	15	63.5
Ghana	1987	88.4		11.6	33.7		66.3
	2003	93.6		6.4	47.9		52.1
Mauritius	2007	66.2	16.8	16.9	n.a	n.a.	n.a.
Mexico	2004	72.4	11.4	16.2	17.5	9.7	72.8
Sri Lanka	2003	74.9	10.9	14.2	18.3	9.7	72
Uganda	2006/7	84.4	7.9	7.6	n.a	n.a.	n.a.
Uruguay	2005	50.3	23.4	26.3	13.3	16	70.7
Venezuela	2001	41.8	15.9	42.4	6.7	7	86.3
United States	2005	64.3	16.2	19.6	16.5	12.9	70.6

Source: (Bloom et al. 2013), own calculations for South Africa and Ghana

d) Productivity, capital-intensity and wages at the firm level

Table 6 provides descriptive statistics of real output per employee (labour productivity), the capital-labour ratio (capital-intensity) and average wages (labour cost per worker), all deflated by the GDP deflator. These show a broad increase over the period – average output per worker and capital-intensity were 55 percent higher in 2008 than 1996, although the average wage was only 5 percent higher. Labour productivity and capital intensity increased substantially between 2001 and 2005.[26] These observed changes in the averages across the years are not driven by sector differences and are robust to controlling for sector.[27]

The largest increase across all these variables occurs in the early 2000s, a period directly after the substantial unilateral trade liberalisation and the introduction of the suite of new labour market regulations in the late 1990s. Accompanying this increase in labour productivity has been a shift towards higher capital-intensity in production but little increase in the average real cost of labour. To investigate this further we examine changes in overall productivity (Total Factor Productivity in Revenue terms – TFP-R).

Table 16: Real labour productivity, capital intensity and average wages

	Output per worker	Capital per worker	Average labour cost
Year: 1996			
Mean	5.73	3.48	4.20
Median	5.67	3.49	4.25
Std dev	0.80	1.23	0.64
N	1470	1437	1470
Year: 2001			
Mean	5.83	3.35	4.11
median	5.78	3.33	4.19
Std dev	0.85	1.42	0.71

[26]One explanation may be the data: the 1996 and 2001 datasets are linked, as are the 2005 and 2008 datasets but we cannot link between 2001 and 2005.
[27]Regression analysis controlling for sector provides similar results.

n	1467	1428	1467
Year: 2005			
Mean	6.13	3.79	4.23
median	6.09	3.79	4.33
Std dev	1.07	1.52	0.83
n	3340	3471	3552
Year: 2008			
Mean	6.17	3.93	4.25
median	6.08	3.96	4.32
Std dev	0.93	1.35	0.71
n	6177	6301	6395
Total			
Mean	6.07	3.78	4.22
median	6.00	3.81	4.30
Std dev	0.96	1.41	0.74
n	12454	12637	12884

Notes: All variables are in natural logarithms and deflated by the GDP deflator.

In order to investigate changes in TFP-R over time we estimate value-added Cobb-Douglas production functions. These results are presented in table 17. The first column of results is only for value-added per worker; the second is the production function results. These indicate that real labour productivity, measured as value-added per worker, increased by about ten percent between 1996 and 2008. However, this increase does not seem to be driven by an increase in TFP but rather due to the increase in capital-intensity over the period. Once capital is controlled for, overall productivity seems to have fallen slightly. Together with the results above, these suggest that the observed increases in labour productivity are not driven by changes in the underlying productivity of firms in the manufacturing sector but rather the use of more capital and higher intermediate and other input intensity. These firm level results confirm earlier findings from industry level data by Edwards and Golub (2003), who argue that improvements in labour productivity due to capital-labour substitution “are disconcerting insofar

as sustainable long-run output and employment growth depend on raising productive efficiency rather than through capital-labour substitution and labour shedding" (Edwards and Golub, 2003: 677)

Table 17: Total Factor Productivity of South African firms (1996 – 2008)

	(1)	(2)
VARIABLES	Ln(Value-added/worker)	Ln(Value-added/worker)
Ln(Capital/worker)		0.295***
		(0.00590)
Ln(employment)		-0.0517***
		(0.00620)
2001	-0.0280	0.00133
	(0.0326)	(0.0298)
2005	0.147***	0.0501*
	(0.0296)	(0.0270)
2008	0.0996***	-0.0422*
	(0.0273)	(0.0250)
Constant	3.677***	3.217***
	(0.334)	(0.303)
Observations	11,740	11,539
R-squared	0.119	0.278

Standard errors in parentheses, *** p<0.01, ** p<0.05, * p<0.1

e) Firm size, productivity, capital-intensity and wages

The average results presented in the previous section masks different outcomes for different sized firms. It seems that outcomes for smaller firms, particularly those in the 10-19 size group, have changed relative to bigger firms. Output per worker increased by relatively more for these sized firms but capital-intensity did not increase as much. Instead real average wages have risen, as has overall productivity. This suggests that the increase in TFP-R observed for these smaller firms may be driven by a relative increase in the share of skilled workers (and thus average wages) within these firms. This shift in employment type within small firms would be consistent with a labour market regulations and institutions which raise the cost of labour by more for smaller firms (see figure 28).

Figure 28: Labour productivity, capital intensity, wages and productivity by firm size (2008 values relative to 1996)

Notes: These are coefficient estimates of the 2008 year dummy in an OLS regression where the outcome variable is specified as a natural logarithm and size groups are dummy variables. Sector specific controls as well as dummy variables for the other years are included. All differences are significant at the 5% level except average wages for the 50-99 and 100+ size groups and TFP-R for the 20-49 size group.

These firm-level results and existing firm-level research suggest that labour productivity and TFP-R amongst small manufacturing firms has increased substantially relative to other sized firms since 1996. There are a number of potential explanations for these observations, and since the observed responses differ across firm sizes, the most likely explanations should take this into account. These explanations include: changes in the cost of capital for different firms; technological changes; the impact of competition, including international competition; and the observed changes in the labour regulations or other regulatory aspects.

5. Labour market trends in South Africa since 1994

With the shifts of the economy away from labour intensive production towards capital intensive production and the observed changes in firm characteristics, how successfully has the South African labour market restructured to improve the lives of all South Africans?

Whilst both employment levels and the proportion of working aged adults in employment have increased during the post-Apartheid period so have unemployment levels and the unemployment rate remains high. Furthermore, labour market outcomes still differ across race groups – for example fewer than half of Africans aged 20 to 60 are currently employed, compared to more than two-thirds of White South Africans. Importantly, the median real wage among African South Africans has not increased substantially since 1996, and is only approximately 20% that of the corresponding figure for White South Africans.

The persistence in inequality in labour market outcomes since the end of Apartheid has provoked a large literature on the trends and potential causes of employment, unemployment and earnings in South Africa[28]. This suggests that the limited growth of employment and real wages among the majority of Africans since the end of Apartheid can be attributed to shifts in the economy from more unskilled labor-intensive sectors to sectors that are relatively more skill-intensive in labour but also within-sector shifts which favour better skilled workers. These shifts have disproportionally affected younger birth-cohorts. In addition to this, increased labour force participation, driven by increased participation of African females (Casale and Posel, 2005) and labour market entry occurring at earlier ages (Branson and Wittenberg, 2007, Burger and von Fintel, 2014) has meant that despite job creation unemployment has remained substantial.

Compounding the unemployment problem are the challenges facing South Africa's education system. Although access to education has improved significantly for the African community, the general quality of education has not (Spaull, 2013b). Thus it seems that unless educational reform happens, it is unlikely that the education system will help reduce unemployment through improving the skills-levels of existing cohorts.

[28]This literature includes, among others, Kingdon and Knight (2007), Banarjee, Galiani, Levinsohn, McLaren, and Woolard (2008), Burger and Von Fintel (2009), Fourie (2011),Branson, Aldington, Lam, and Leibbrandt (2013), Bhorat and Goga (2013), and Cichello, P., Leibbrandt, M., & Woolard, I. (2014).

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Box 5: Education in South Africa since 1994

The education system during the Apartheid area reflected the same inequalities as present in other spheres. Access to and the quality of education provided to Africans was significantly lower than the type of education provided to Whites. To address these inequalities, the government implemented the South African Schools Act in 1996 with the aim to provide universal access and quality education to all learners in South Africa. The Act also stipulated compulsory schooling for all children in South Africa between the ages of 7 and 15. Despite the fact that similar laws of compulsory schooling existed during the Apartheid area, these laws were not necessarily enforced, especially in rural areas.

The government has spent a considerable amount of its fiscal budget on education since 1994. Although the budget share of education has fallen since 1994 (from 22% of total government expenditure in 1994 to around 16% by 2010) in real terms spending has increased marginally. (Taylor et al, 2008)

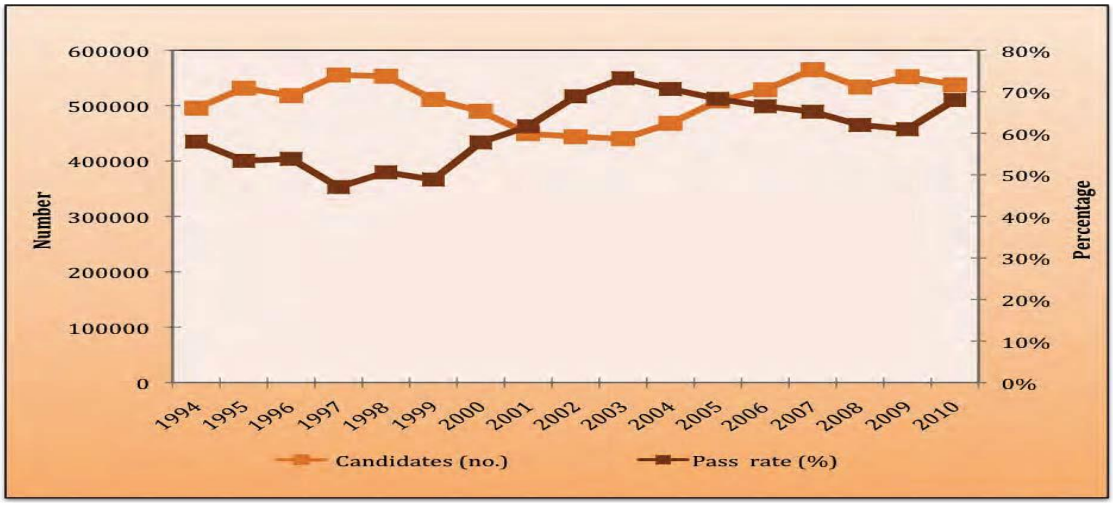
While more than 80% of the education budget is spent on salaries, increased spending on building more schools across South Africa significantly improved access to schooling. Gross enrollment ratios (GER) for primary schooling were already high due to significant increases in primary education enrollment in the early 90s, but secondary education GER has increased steadily since 1994. By 2010, almost 100% of all children aged 7-15 attended educational programmes (DBE, Macro indicator trends in schooling, summary report, 2011).

Furthermore, in order to provide quality education to all learners, the government ensured that the share of qualified educators - someone with completed secondary schooling and at least three years of professional training as an educator - increased across all schools, in particular among African schools. Thus, while in 1994 only 64% of all educators were qualified, by 2010 95% of all educators fulfilled this requirement. (DBE, 2011)

Unfortunately, the improvements in the quantity of education have not been matched with improvements in the quality of education. Despite increasing numbers in secondary schooling, the

number of learners who manage to get into the final year of secondary schooling has not increased (figure 29).

Figure 29: Total number of learners and pass rates in Grade 12 (matriculation) 1994 - 2010

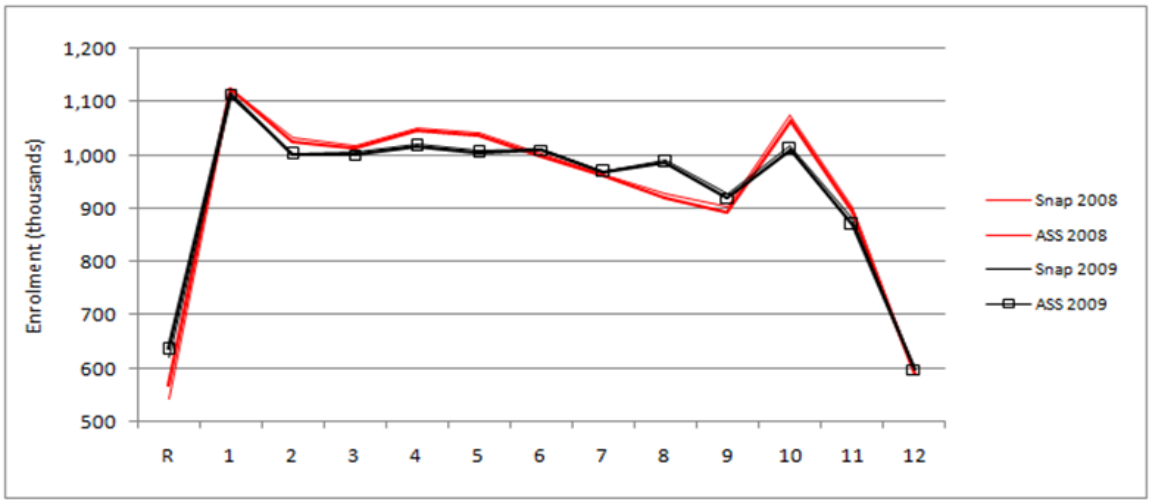


Source: DBE, Macro indicator trends in schooling: summary report 2011

Specifically, the majority of learners do seem to proceed through the various grades up to Grade 9 without large drop-out rates (less than 3% per grade). However, during the final three years of secondary schooling, drop-out rates increase dramatically (up to 24%) with only a very small number

of learners registering for the final set of examinations at the end of Grade 12 (see figure 30). Thus, as Spaull (2013b) argues, of 100 learners that enter grade 1, only 50 manage to get to Grade 12 of which 35 pass the matriculation and only 12 achieve a Bachelor exemption, i.e. marks that allow them to apply for university studies.

Figure 30: Enrolment by grade 2008-2009

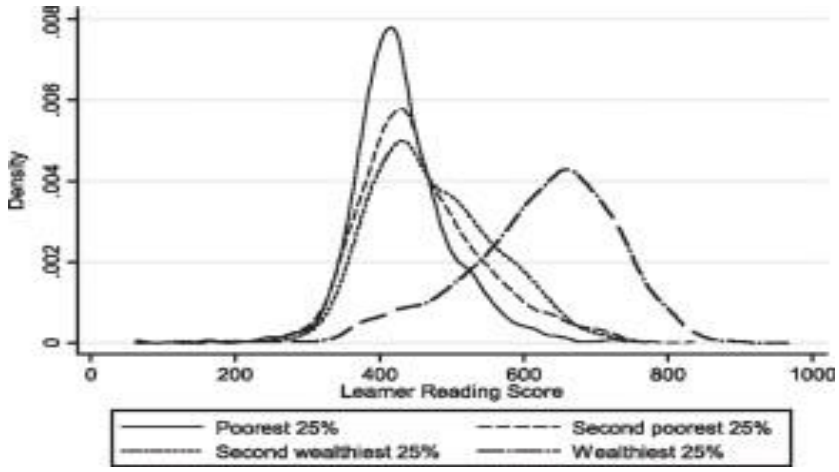


Source: Gustafsson, 2012

This is an outcome of learners being passed through grades without achieving the required competencies but then being hold back in the final years of secondary education since schools are measured according to their Grade 12 examination pass rates.

South Africa performs relatively poorly compared to other middle income countries and African countries in standardized international test instruments like PIRLS, TIMSS, SAQMEC (Spaull, 2013b).Quality of education is also highly correlated with income. Learners that attend schools which fall into the highest income quartile (generally historically White schools) outperform learners in schools of all other income quartiles (figure 31). The South Africa's education system is therefore still characterized by two separate education systems which are highly correlated with income and race.

Figure 31: Distribution of grade 6 reading performance by school wealth quartile



Source: Spaull, 2013a

Even if learners pass secondary schooling, obtain university exemption, find funding for their studies and manage to get accepted, very few students actually graduate with a higher education degree. Based on data on the first year cohort entering Higher education institutions in 2000, the Department of Education showed that 30% of that cohort dropped out at the end of their first year, 11% in second year and 9% in third year. Thus, between 2000 and 2002, 50% of the initial first year cohort exited tertiary education. Eventually less, than 50% passed their bachelor studies. (DoE, 2005). Taylor et al (2008) argue that "high drop-out rate and poor throughput rate also points to the fact that many learners leave school and enter the higher education system without the cognitive skills necessary for the attainment of high level skills and knowledge" (Taylor et al, 2008: 47).

Transitions from schooling into employment are hampered by the poor quality of education. There is little difference in employment probabilities for job seekers that enter the labour market with Grade 1 or incomplete Grade 12. Passing the final year of secondary schooling and obtaining a matriculation certificate increases the employment probability but this may be due to signaling. Only further education and tertiary education affect employment probabilities significantly (labour market section of this report) but that level of educational attainment is achieved by a very small proportion of school leavers.

In the interim policy-makers will have to continue pursuing active labour market interventions that facilitate both transitions into employment among and an increase in the productivity of relatively unskilled workers. These include post-school training, direct employment-creation schemes, and private-sector incentives such as subsidies, as well as fostering a macroeconomic posture that is conducive to both investments in unskilled labour and revenue collection. It is unclear, though, if these programmes should be general or if they should be targeted. As Bhorat and Goga (2013) show, employment in primary sectors (agriculture and mining) has decreased significantly, the manufacturing sector has remained stagnant, and only tertiary sectors and tertiary occupations have experienced employment growth.

Box 6: Active labour market policies

Skills development policies

The National Skills Authority was established in 1999, and in 2000 a pay roll levy was introduced to fund skills development through the National Skills Fund – which was established in terms of section 27 of the Skills Development Act of 1998. (Department of Labour, 2001) A National Skills Development Strategy was launched in 2001. The second phase of this strategy commenced in 2005, and a number Sector Education and Training Authorities (SETAs) were established to respond to skills development in particular sectors of the economy. (Department of Labour, 2005). The SETAs are responsible for promoting learnerships and apprenticeships in these sectors. Learnerships were introduced "as a structured training intervention culminating in a qualification recognised on a National Qualifications Framework (NQF), aiming to provide a quality learning experience by integrating theoretical education and work-based skills training." (Visser and Kruss, 2009: 359). Kruss et al. (2014: 2) find that learnerships have "a total enrolment ranging between 44 000 (2010) to 55 000 (2005) learners, while the apprenticeship system is much smaller, catering for approximately 9 000 to 12 000 new learners per year." The majority of "apprenticeship and learnership participants (70% and 86% respectively) who completed their qualification experienced a smooth transition directly into stable employment."

Concurrently, the Joint Initiative for Priority Skills Acquisition (JIPSA) was implemented from 2006 to 2009 by The Presidency of the Republic of South Africa. The objective of the programme was to supply priority skills to the economy. The Presidency (2010) estimated that, during JIPSA, the number of engineers grew by approximately 14%, the number of technologists increased by approximately 16%, and the number of technicians grew by approximately 4%. Further, over 40 000 artisans also went into training or qualified in the priority areas.

The third, and current, iteration of the National Skills Development Strategy (III, 2011) continues to rely on sector strategies (aligned to government and industry development strategies) and programmes addressing unemployment that are being developed and piloted by SETAs in partnership with the National Skills Fund (NSF). (Department of Higher Education and Training, 2011) It also restructures some of the Professional, vocational, technical and academic learning (PIVOTAL) arrangements (which include Learnerships) between SETAs, educational institutions, employers and learners; and includes incentives for training and skills development capacity in the cooperative, NGO and trade union sectors, including community and worker education initiatives. Approximately 250 000 learners were certified through SETA programmes from 2011 to 2013. (Department of Higher Education and Training, 2014)

Direct employment policies

The Expanded Public Works Programme (EPWP) was first implemented in 2004. While the EPWP is administered by the Department of Public Works, it extends across multiple Government departments. The primary objective of the programme is to provide income relief to poor South Africans through temporary work for the unemployed to carry out socially useful activities. In the first phase of the EPWP, from 2004 to 2009, more than 1 million opportunities were created. (Department of Public Works, 2010). McCord (2005) finds, though, that many of these beneficiaries returned to unemployment.

The second phase of the EPWP was initiated in 2009, and includes among others the Community Work Programme (CWP) that is administered by the Department of Cooperative Governance. The objective of this component of the EPWP is to provide poor South Africans with a minimum number of days of work. In 2009/10 approximately 625 000 opportunities were created through the EPWP (Department of Public Works, 2010 – B). The number of opportunities that have been created has increased to approximately 1 000 000 in the 2013/14 financial year. (Department of Public Works, 2014).

A Jobs Fund was launched by the National Treasury in 2011 to co-finance projects by public, private and non-governmental organizations' that contribute to job creation. Since 2011 approximately 30 000 permanent new jobs and 10 000 short terms jobs have been created by programmes associated with the Jobs Fund.

Youth targeted policies

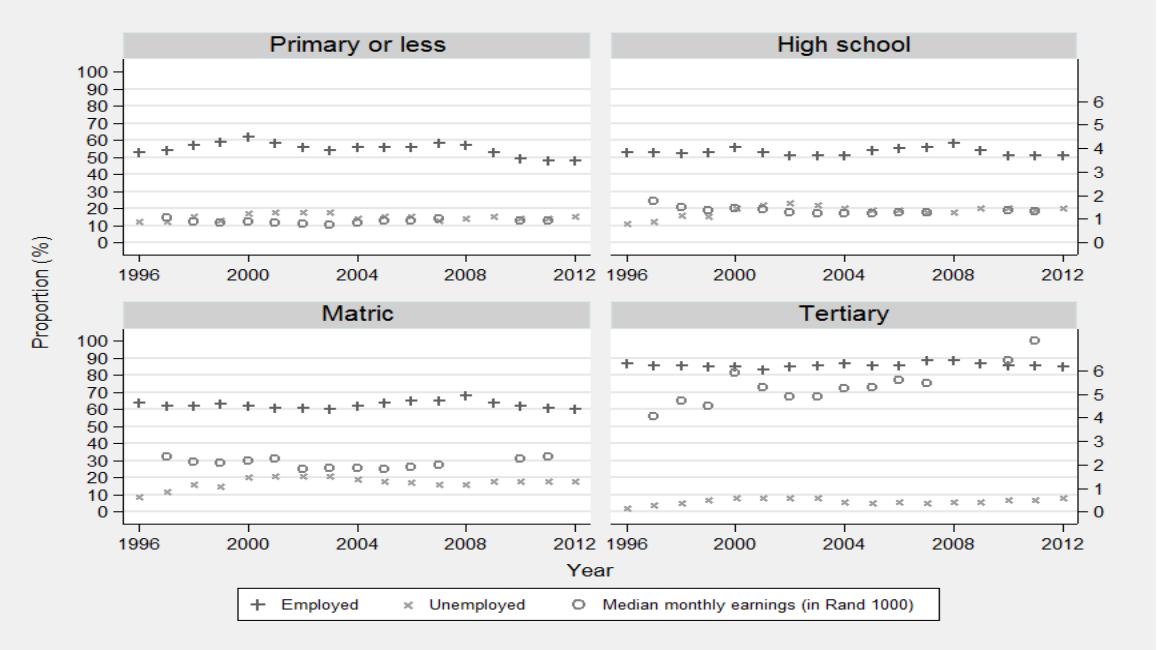
The National Youth Development Agency (NYDA) was established in 2008. It initially focused on enterprise finance but has recently shifted to education and skills development. Approximately 200 0000 to 300 000 young South Africans received advice from an NYDA programme in the second quarter of 2014 (National Youth Development Agency, 2014). There is, however, no evidence on the impact of this advice. It also appears the enterprise finance, and education and skills development initiatives had a very limited reach.

In the beginning of 2014 the National Treasury of South Africa introduced the Employment Tax Incentive (ETI). The objective of the incentive is to increased employment among young South Africans aged 18 to 29. However, Ranchhod and Finn (2014) find that the ETI had no effect on the employment of young South Africans in the first six months of 2014, although they do acknowledge that their approach may not be able to pick up the initial projected changes.

Studies such as Branson et al (2013) and Bhorat and Goga (2013) have examined changing labour market outcomes in South Africa since the end of Apartheid. This section extends this by exploring the relationship between labour market earnings and shifts in employment sectors from 1996 to 2012 using Kerr, Lam, and Wittenberg's (2013) Post-Apartheid Labour Market Survey (PALMS).

5.1 Descriptions of the South African labour market from 1996 to 2012

Figure 32 and 33 below show the proportions the population group, for males and females respectively, which were employed or unemployed from 1996 to 2012 as well as their median real monthly earnings for this period. There are stark differences across race groups: unemployment rates have increased for Africans and Coloureds groups whilst median real monthly wages have only increased marginally; Whites and Indians have seen little change in their employment probabilities but definite increases in their median real monthly wages. There are several explanations for the muted increase in median wages among Africans. The first is that, as Bhorat and Goga (2013) find and Figure 34: Labour markets outcomes among males in South Africa from 1996 to 2012 by education



to 39 below show, earnings growth is strongly correlated with education, skill, and particular sectors. Specifically, there have been no changes in the median real monthly wages for workers with less than complete secondary schooling. Noteworthy as well is the fact that the employment probability as well as wages are almost identical for workers that have no education or anything less than complete secondary education (without Matric certification) and that there is no change over time. Completing secondary schooling and obtaining a Matric certificate immediately increases the employment probability as well as median wages. However, the workers who have seen wages and employment probabilities rise the most over the last twenty years have been those with tertiary education.

Over the past twenty years government jobs, and wages within these jobs, have increased substantially. Workers employed in the public sector (including education and health) experienced the highest growth in median real monthly wages of all sectors. In addition to this, the public sector is one of the largest proportional contributors to employment growth over the 2001 to 2012 period (Bhorat, Goga and Stanwix, 2014). Our graphs also indicate a clear gender dimension across sectors over the last two decades. Females are mainly in self-employment, private household and increasingly in the

sales sector. As for males, the majority have also been working in self-employment, decreasingly in manufacturing and increasingly in sales.

In terms of occupations, there has been an increase in the share of elementary employment across males and females. However, only the higher skilled occupations (Senior and professionals) have actually experienced increases in their median wages. Bhorat et al (2014) have shown that the increase in high skilled jobs (managers and professionals) accounted for 46 per cent of the change in employment between 2001 and 2012. A further 31 per cent came from changes in employment in medium skilled jobs and only a quarter from unskilled occupations.

Bhorat et al (2014) decompose the changes in labour demand into between and within sector shifts. They find that the highest relative demand is for professionals, clerks, managers and sales and service workers, and the lowest is for elementary workers, operators and assemblers and domestic workers. This fits with the broad trends in the economy of employment growth in tertiary sectors such as financial services, community services and retail, and shifts away from unskilled workers. They also find that within sector changes dominate between sector changes for all occupational groups. Thus, the observed change in labour demand, and in turn employment probabilities and wages, is driven primarily by changes within sectors – firms within these sectors are increasing demand for higher-skilled workers.

An additional explanation for the fact that labour market outcomes for Africans have not improved is, among others, that these figures mask a higher proportion of younger workers. **Error! Reference source not found.** - 53 in the Appendix C provide an overview of the proportion of each birth-cohort by population group, by their level of education, that are employed in particular sectors, and in particular occupations (for non-African and African males and females respectively). **Error! Reference source not found.**4 - 69 present the median real monthly earnings for these groups. The graphs show changes in proportion or median wages for each cohort over time. The x-axis shows each cohorts starting with the birth-cohort of 1940. We observe individuals between the ages of 20 and 60 from 1996 to 2012. Therefore, individuals born in 1940 will only be observed until the year 2000, the year in which they turn 60. Thus, from 2001 onwards, the 1940 birth cohort is no longer part of the birth-cohort panel. On the other hand, the birth-cohort of 1985 will only be observed from 2005 onwards, the year in which they turn 20. The graphs contain two types of information: across birth cohorts in the same year (horizontal comparison) and within birth cohorts over years (vertical comparison). To reflect change, an increase in the proportion or the median wage is indicated by an increasingly darker colour. An increasingly darker colour from the left side of the graph to the right side of the graph would indicate an increase in the proportion as we move from the older birth cohorts to the younger birth cohorts. For example, figures 44 and 45 show that younger African birth cohorts have an increasingly

higher proportion of school leavers with complete secondary schooling compared to older African birth cohorts (horizontal comparison). An increasingly darker colour from the bottom of the graph to the top of the graph would indicate an increase in the proportion within the same cohort over time.

With that in mind we can see that African South Africans generally have lower levels of education compared to all other race groups, and are employed in occupations and sectors which require lower levels of skill and which are associated with lower earnings (such as private households). While younger African birth-cohorts are also more likely to have completed secondary schooling and obtained a Matric certificate, it appears that the relationship between earnings and education, occupation and employment has shifted among the youngest birth-cohorts. This corresponds to Branson et al. (2013), who find that the returns to education have generally been decreasing among younger cohorts. It is interesting to note that the median wages for Africans in the education sector have increased since 1996 and are substantially larger than for those in the private sector. The figures appear to show us, though, that both employment and earnings are positively related to age (or to time).

Figure 32: Labour markets outcomes among males in South Africa from 1996 to 2012 by population

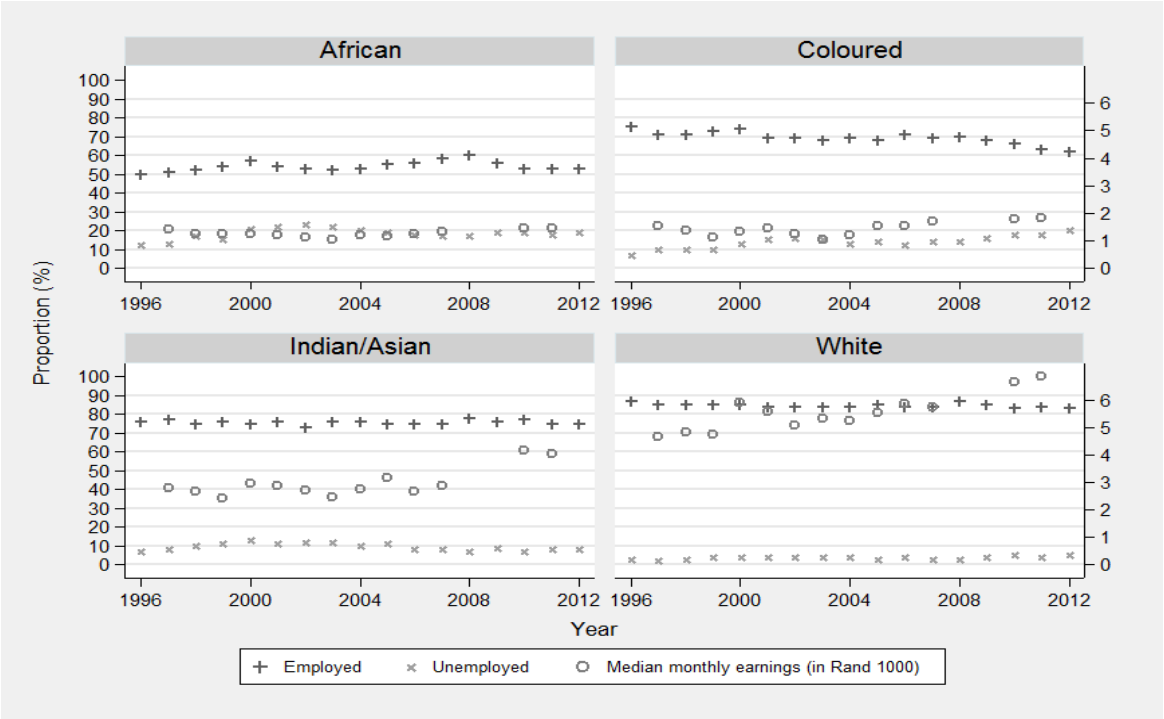


Figure 33: Labour markets outcomes among females in South Africa from 1996 to 2012 by population

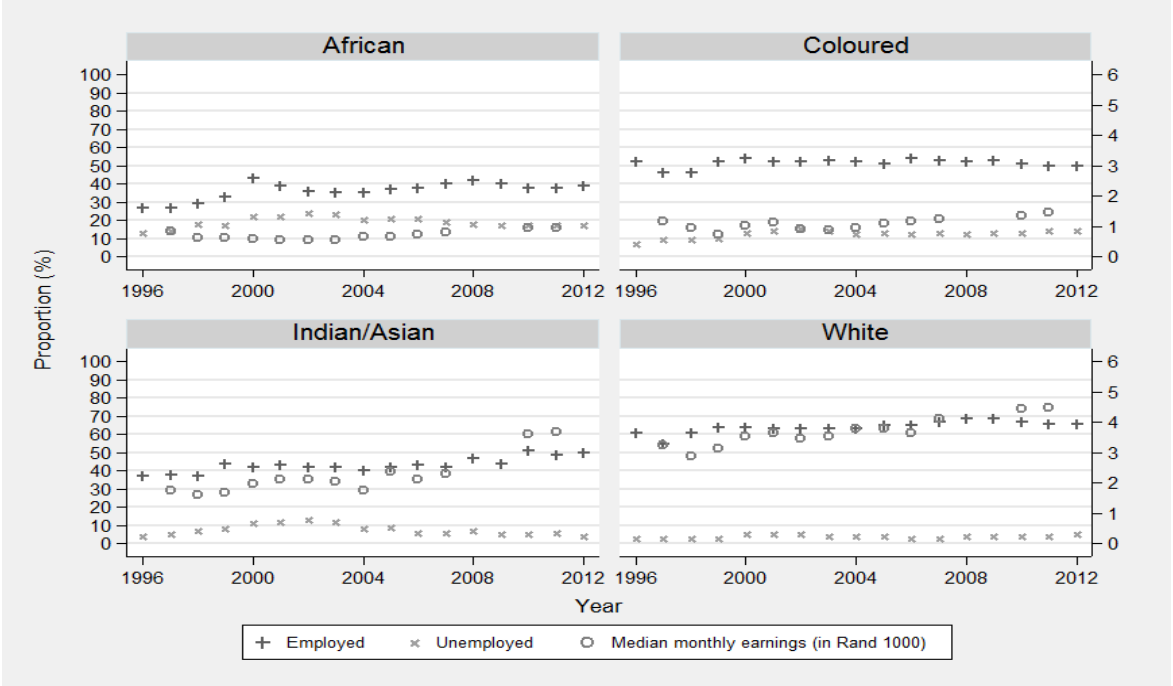


Figure 34: Labour markets outcomes among males in South Africa from 1996 to 2012 by education

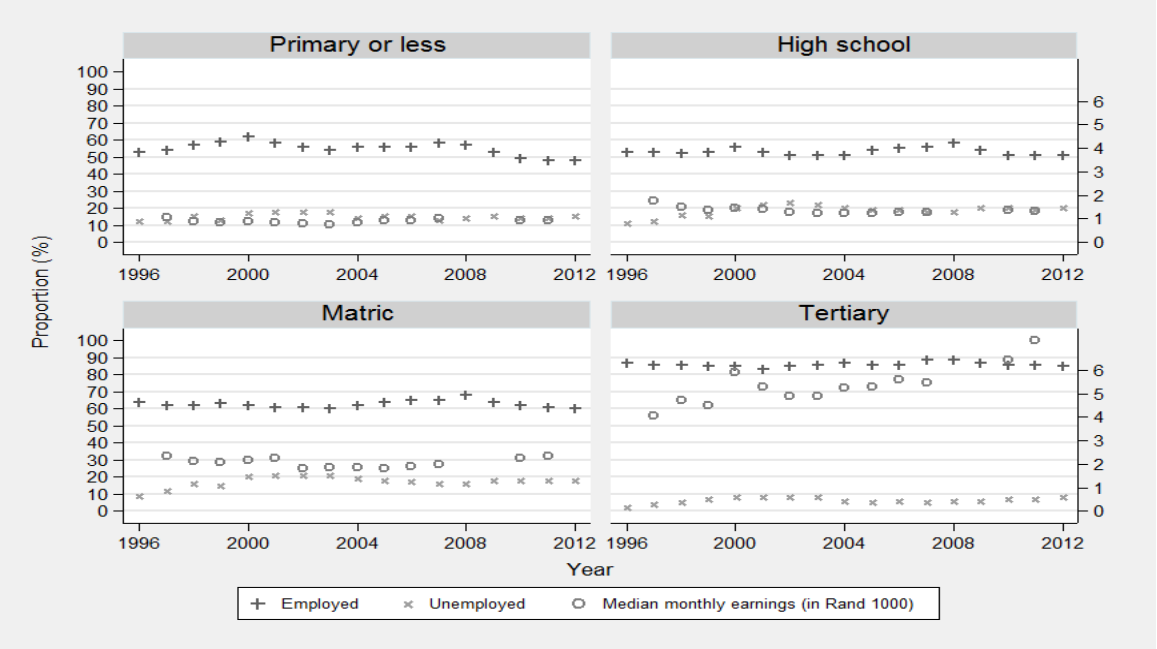


Figure 35: Labour markets outcomes among females in South Africa from 1996 to 2012 by education

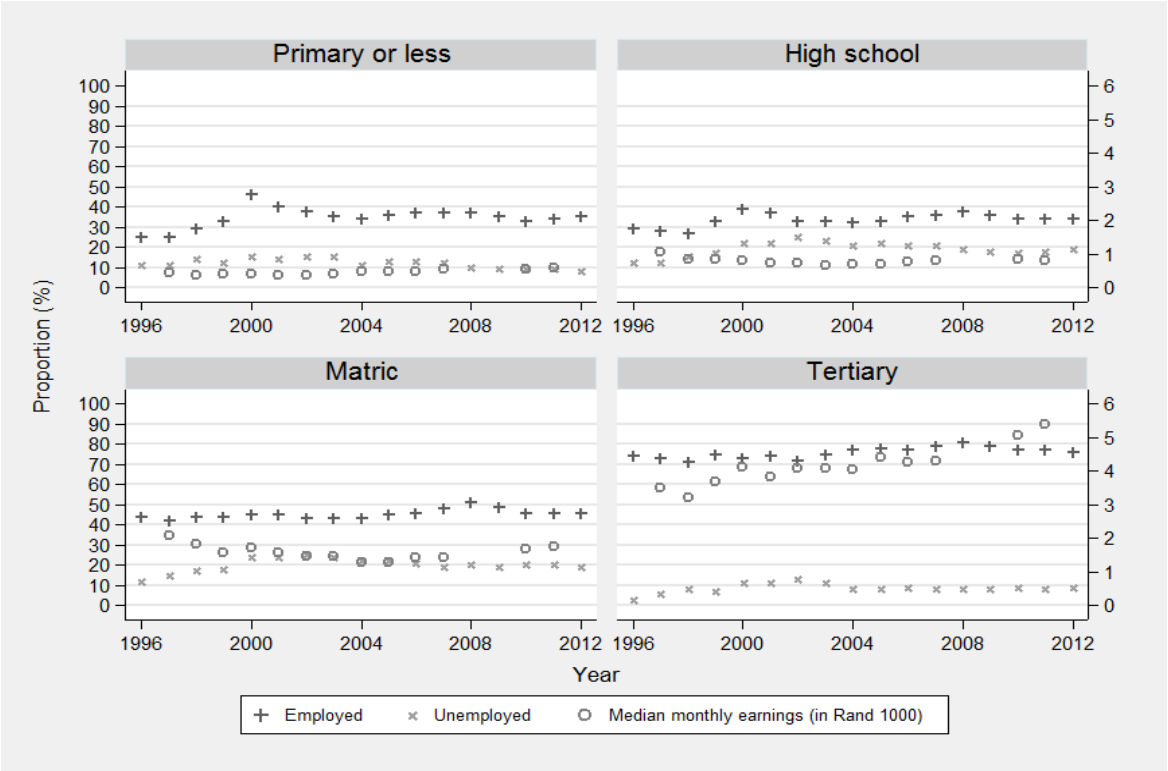


Figure 36: Labour markets outcomes among males in South Africa from 1996 to 2012 by employment sector

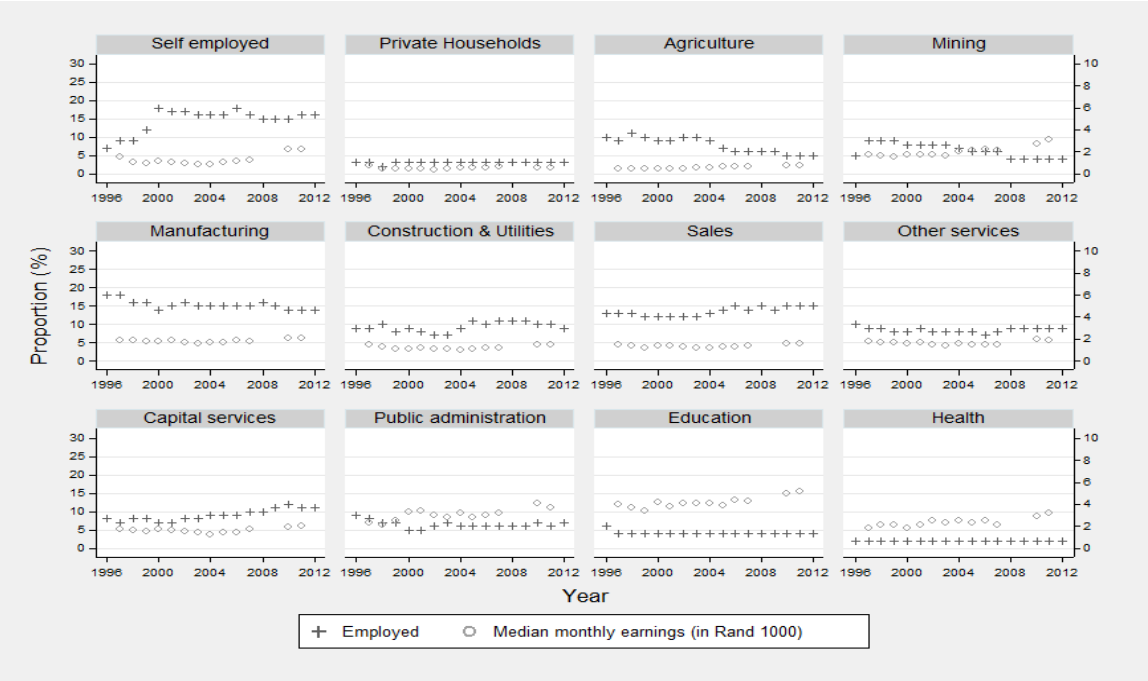


Figure 37: Labour markets outcomes among females in South Africa from 1996 to 2012 by employment sector

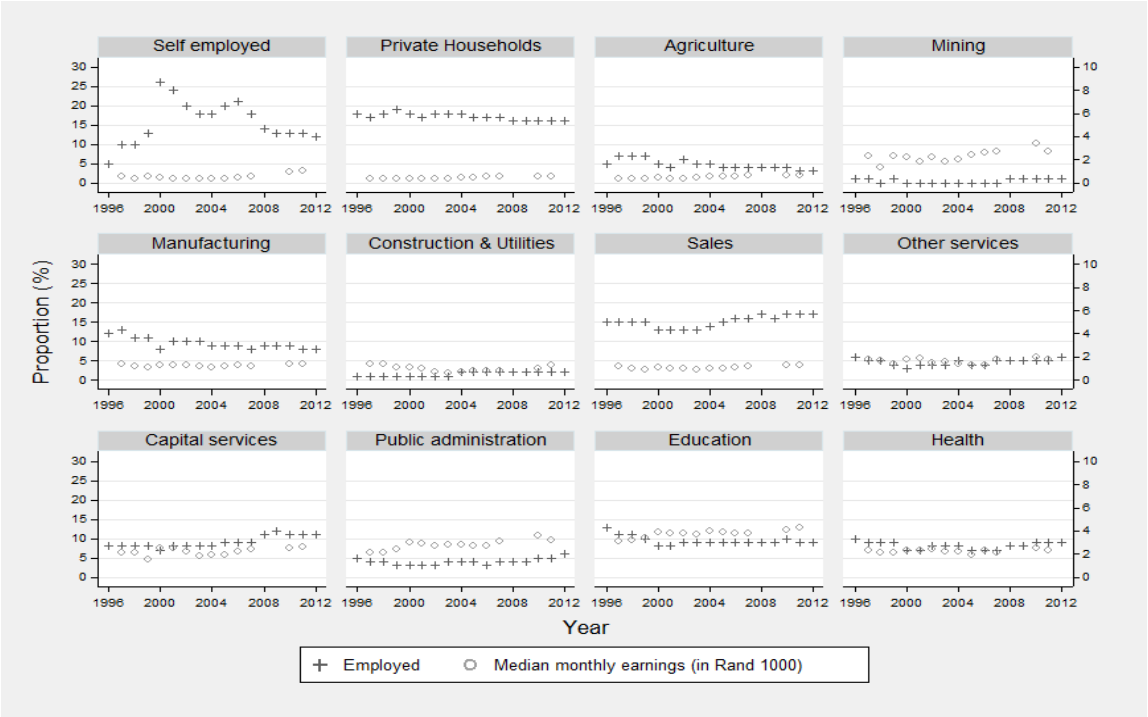


Figure 38: Labour markets outcomes among males in South Africa from 1996 to 2012 by occupation

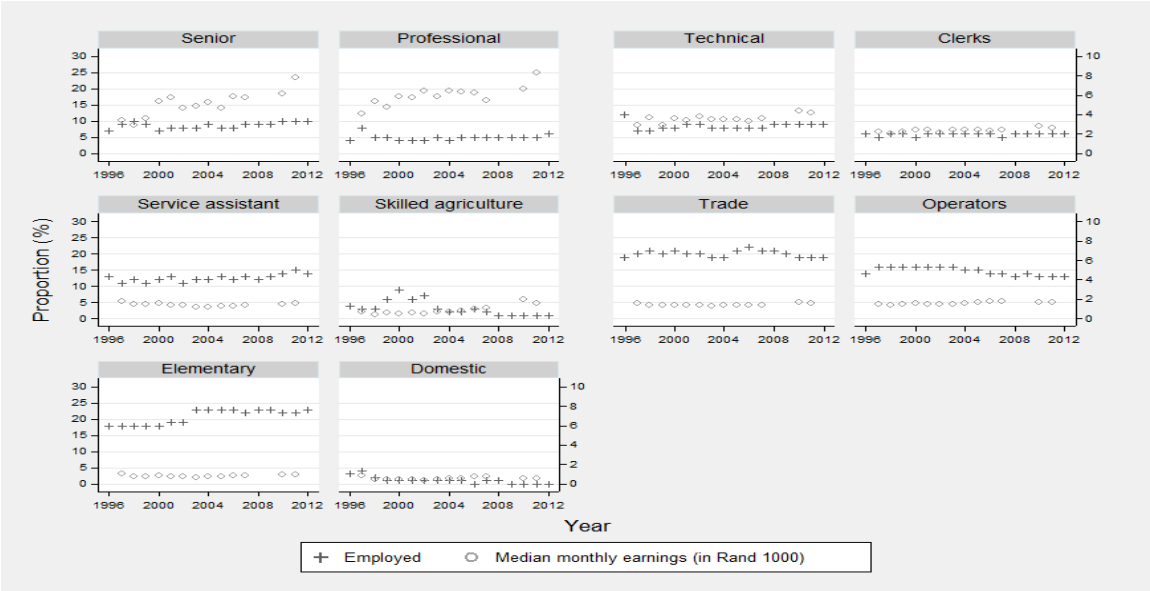
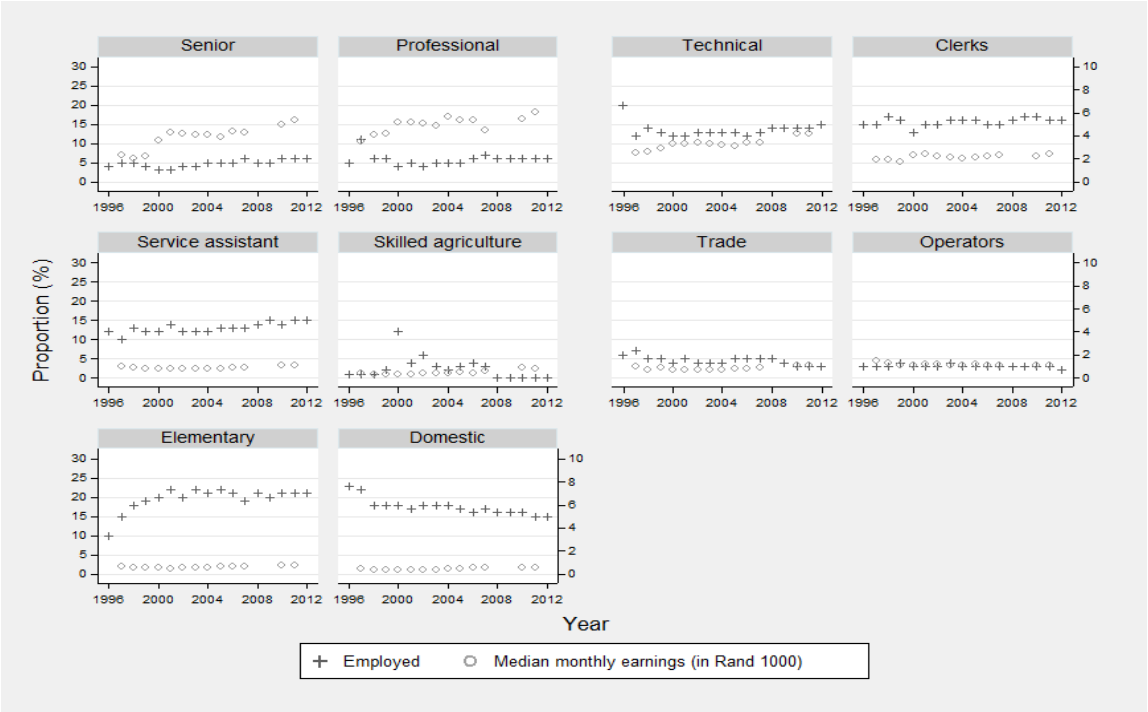


Figure 39: Labour markets outcomes among males in South Africa from 1996 to 2012 by occupation



5.2 Labour market outcomes by birth cohort

The descriptions in the previous sections show that there is substantial variation in employment and earnings across the sector of employment, occupation, and education, between birth-cohorts, and over time. This section attempts to isolate the separate effects of these particular worker and labour market characteristics by constructing a birth-cohort pseudo-panel, for both African males and females. The birth-cohort pseudo panel can be used to control for any cohort specific fixed effects as well as for exogenous shocks that were specific to a particular cohort but affect future outcomes of the cohort over time. To do this, we follow Baltagi and Wu's (1999) approach to unequally spaced- and

unbalanced panel fixed-effects regressions with AR (1) disturbances. The exact details of this approach and the regression output (table 16) are presented in the Appendix B.

The descriptive overview of the labour market suggests that while the labour-market outcomes of African South Africans generally improve with age, they appear to be becoming worse among younger birth-cohorts and less educated South Africans. The birth-cohort pseudo-panel confirms that there are significant returns of age. The median wage in cohorts aged 50 (which is when the median wage is highest) is more than double the median wage for those aged 20 (which is the minimum median wage).

There have also been significant returns – in terms of the median wage of the birth-cohort holding employment and labour force participation (and therefore unemployment) constant – to the increase in the mean years of education of employed workers within birth-cohorts. The mean years of education of employed workers has increased from approximately seven and a half years for males and eight years for females in 1996, to nine and a half years for both males and females in 2011. The relationship between the mean years of education of employed workers and earnings is concave, though. While hypothetically increasing the mean years of education among the employed from 9.5 in 2011 to 10.5 for females would 'imply' an increase in the median real wage of approximately seven percent, it would have no effect for males. However, it is not possible to decompose the contribution of employment experience and other unobservable individual characteristics that are closely related to age and education on productivity. It is therefore interesting to note that earnings are negatively related to labour force participation among females.

When focusing on the relationship between occupations within sectors and earnings the results suggest that the effects of the employment sector and skills on earnings within birth-cohorts are less pronounced than those for age and, in the case of females, education. However, the results may be more amenable to short-term interventions: there is (generally) a positive correlation between earnings and skills (in particular among clerks) even after one considers the effects of age and education. The relationship between the different skill levels of employment and earnings is, however, mediated by the sector of employment. There is evidence of a positive relationship between unskilled male employment in the private and public sectors (again generally) and the first quartile of the earnings distribution within these cohorts; and in both the first and second quartiles of the earnings distribution for semi-skilled employment in the manufacturing sector for male-, and in the retail and wholesale trade sector for males and female-, employment. Indeed, the retail and wholesale trade sector appears to have contributed significantly to the earnings of African females across quartiles. In contrast, there is a negative relationship between earnings for unskilled labour in self-employment, particularly among females, and for both unskilled and semi-skilled male labour in agriculture.

Any analysis from these results is limited in important ways. First, the results are associations (albeit associations net of birth-cohort 'fixed-effects' and the effects of the other explanatory variables that are presented in the preceding table). In particular, the analysis does not explicitly consider the interdependence between employment across birth-cohorts and sectors, occupations, and for particular levels of education in employment. Furthermore, despite the inclusion of the unemployment state in the model, it is not possible to disaggregate this state, and hence, the effects of the business cycle and technology are relegated to the first-order autoregressive error term.

However, despite being limited by the data and the methods to exploit this data, the findings in this section reflect the trade-offs that policy-makers are confronted with. Accordingly, active labour-market policy in South Africa should target manufacturing employment. Interventions that target employment in the public, or in the retail and wholesale trade sectors, are unlikely to be sustainable unless there is a corresponding increase in aggregate output and demand. Indeed, it is important to note that a positive relationship between employment and earnings may be attributed to employment contractions. In this particular data set, however, the manufacturing share of employment has remained fairly stable since 2000, despite considerable variation. This allays some of the concerns that the relationship between employment and earnings should be attributed to decrease in relatively higher-paid unskilled and semi-skilled employment in this sector.

6. Conclusion

Since 1994 and the transition to democracy, South Africa's economic policy has faced a number of, often conflicting, challenges: how to create jobs for a workforce with a poor educational background, whilst addressing inequality and becoming internationally competitive. These challenges are keenly felt in the tensions between labour market regulation and international competitiveness where policies have changed substantially since 1994.

In the 1990s South Africa reintegrated into the world economy through the repeal of economic sanctions and tariff reforms. The new post-Apartheid government adopted the multilateral trade liberalization programme negotiated during the Uruguay Round of the GATT/WTO and continued with free trade agreements with the European Union (EU), the Southern African Development Community (SADC), and the European Free Trade Association (EFTA) in the 2000s. These trade reforms led to substantial increases in both imports and exports, and, although the impact of this increased trade on output and employment was broadly positive it did differ across sectors – for example, within manufacturing net trade reduced employment in labour-intensive industries but increased employment in capital-intensive ones. Furthermore, South Africa's trade liberalisation happened just prior to China's rapid integration into the world economy. Thus, South Africa's newly liberalised sectors faced increasing competition from imports from China.

In parallel to these trade reforms, South Africa implemented a set of new labour regulations. These regulations were intended to modernize existing regulations and extend protection and rights to black workers who were not covered under Apartheid-era regulations. A close relationship between government and organized labour meant that these regulations focused on the conditions of work, protection of employment, and institutionalized bargaining structures for those with jobs, rather than making it easier for companies to employ people. These two broad policy changes thus were in tension – firms were facing increasing international competition and better access to imported intermediate inputs through trade reform, but more restrictive employment regulations due to new labour regulations. At the same time, macroeconomic stability – a successful outcome from government's macroeconomic policies and the GEAR programming, meant that the cost of capital was falling. In the labour market labour supply changed too – in the 1990s more females and young people wanted to work which resulted in an increase in labour force participation rates. All these factors have come together to influence labour market outcomes over the past twenty years.

Although the South African economy has created relatively large numbers of jobs in the last twenty years, the rate of job creation, and the types of jobs, have not been sufficient to reduce the absolute

level of unemployment, nor the unemployment rate substantially. The post-Apartheid labour market has benefitted those at the top of the income and skills distribution the most and jobs and wages for those in high-skilled occupations have increased substantially relative to low-skilled occupations. Part of this is explained by between sector changes in the South African economy. Sectors which have traditionally employed large numbers of low-skilled workers – agriculture, mining and manufacturing, have been contracting and services and government employment have been rising. However, most of the observed change in labour demand has been driven by within sector changes. Within sectors the labour-intensity of production has been decreasing and the skills-intensity increasing. Furthermore, the size distribution of firms seems to be changing too – the employment share of smaller firms, the types of firms which are arguably most likely to employ people with the profile of the currently unemployed, has been falling.

Although some of these changes may have been the result of increased trade, there is very little work investigating the trade-off between trade liberalization and labour market regulation in South Africa. The South African labour regulation environment has a number of different components which may affect firms including regulations on the basic conditions of employment, affirmative action legislation and institutional wage setting. Firms of different sizes and characteristics such as productivity or technology, participating in different markets are likely to have reacted differently to this combination of increasing international opportunities and competition and more progressive labour regulation. Furthermore, it is likely that some aspects of these regulations and the institutional structure will be more binding than others, and this too may differ across firms of different types and characteristics. To better understand these dynamics requires firm-level databases which link these changes to firm outcomes, specifically their sales, production and employment decisions. It will also require the use of credible techniques to construct counterfactual groups to determine the impact of these changes.

With a better understanding of firm responses to changes in their environment, it is also possible to unpack employment effects that are subsequent to changes in firm outcomes. For instance, casualization of labour is likely to be a direct consequence of firms responding to increasing competition in a regulatory environment which limits adjustment in other ways. The effects of firm outcomes on the quantity and quality of employment are equally likely to differ across sectors and skill levels. It is for that reason that any discussion trying to align labour market reform and economic growth policy needs to be based on a thorough understanding of such firm and employment dynamics.

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Appendix A: Methodology and data for the Chenery decomposition of changes in output and employment

Input-output decomposition methodology[29]

The standard gross input-output identity can be written as

$$X = A^d X + D^d + E \qquad \textbf{(1)}$$

where X is a vector of sectoral gross output, A^dX is a vector of domestically produced intermediate goods, A^d is the matrix of domestic inter-industry purchases per unit of sectoral gross output, vector D^d is the flow of domestic goods (household consumption, government consumption and capital expenditure) to final domestic demand and E is the vector of exports by sector. Using diagonal domestic content ratio matrices for intermediate goods (h) and domestic demand (f) this expression can be written as

$$X = hAX + fD + E \qquad \textbf{(2)}$$

where AX and D are vectors of domestic plus imported intermediate and final demand goods, respectively.

Letting subscripts 2 and 1 reflect final and initial periods, respectively, changes in output ($X_2 - X_1$) can be expressed as

$$\Delta X = h_2 A_2 X_2 + f_2 D_2 + E_2 - (h_1 A_1 X_1 + f_1 D_1 + E_1). \quad (3)$$

Adding and subtracting $h_2A_2X_1$, $h_2A_1X_1$ and f_2D_1 in the right hand side and then simplifying yields

$$\begin{aligned} \Delta X = \; & R(f_2 \Delta D) && \{row\ 1\} \\ & + R(\Delta h A_1 X_1) + R(\Delta f D_1) + R(\Delta E) && \{row\ 2\} \\ & + R(h_2 \Delta A) X_1 && \{row\ 3\} \end{aligned} \qquad (4)$$

where $R = (I - h_2A_2)^{-1}$ captures the indirect and direct effects of changes in final consumption of domestic goods by government and households (ΔD) (row 1); the effect of international trade through changes in exports (ΔE) and import penetration in the supply of final goods (Δf) and intermediate goods (Δh)

[29] This section draws on Edwards (2001a, b).

(row 2); and changes in input requirements of intermediate goods (ΔA) (row 3).[30] The treatment of import substitution varies widely across the literature (Chenery, 1960; Chenery *et al.*, 1962; Morley and Smith 1970; Syrquin, 1976). In the approach used here import substitution is defined sectorally as arising from changes in the ratio of imports to intermediate and final demand.

The inclusion of the Leontief inverse, which captures the indirect effects of changes in demand, trade and input-output coefficients follows that of Edwards (2001a, b) and extends the subsequent decomposition studies of Edwards (2006), Dunne and Edwards (2007), Jenkins (2008) and Edwards and Jenkins (2013).

Using employment coefficient matrices, the employment impact of changes in gross output can be estimated as

$$\Delta N = n\Delta X + \Delta nX \qquad (5)$$

where ΔN is change in total employment and n is a vector of employment coefficients per unit gross output. Changes in total employment are attributable to changes in sector gross outputs at constant labour use ($n\Delta X$) and to changes in labour use per unit output (ΔnX). We follow Greenhalgh *et al.* (1998) and decompose N into a vector of total employment according to skill level.

By substituting (5) of into (4), the employment impact of structural change (ΔN) can be expressed as:

$$\begin{aligned} \Delta N = \; & n\mathrm{R}(f\Delta \mathrm{D}) && \{row\ 1\} \qquad (6) \\ & + n\mathrm{R}(\Delta h\mathrm{A})\mathrm{X} + n\mathrm{R}(\Delta f\mathrm{D}) + n\mathrm{R}(\Delta \mathrm{E}) && \{row\ 2\} \\ & + n\mathrm{R}(h\Delta \mathrm{A})\mathrm{X} + \Delta n\mathrm{X} && \{row\ 3\} \end{aligned}$$

As in the gross output decomposition explanation, row 1 gives the occupational employment impact attributed to changes in final demand; row 2 the impact attributed to trade flows; and row 3 the impact attributed to "technological change". This approach interprets technological change as changes in labour embodied in intermediate goods purchased by firms as inputs, as well as changes in the labour coefficient of gross output (commonly regarded as an indicator of labour productivity).

[30] The decomposition can be defined either using the final year structural coefficients and initial year volume weights (Paasche index) or using the initial year structural coefficients and final year volume weights (Laspeyres index). The arithmetic averages are presented.

Data

The study draws on Input-Output tables for 1993 and 2011 provided by Statistics South Africa. The tables are aggregated to 28 sectors, 20 of which are manufacturing.[31]

Output is deflated using PPI Commodities for South African consumption. Exports are deflated using the Producer Price Index for exported commodities according to groups and imports using the Producer Price Index for imported commodities according to groups. All PPI indices are obtained from Statistics SA.

Employment data for agriculture, mining and services are obtained from Quantec. Manufacturing employment levels are calculated using the employment series data provided by Statistics South Africa (see Edwards and Jenkins (2013) for a discussion of the employment data series).

Appendix B: Data and methodology for the analysis of birth-cohort labour market trends

Data

The literature on employment and earnings in South Africa has been aided by a relative abundance of high quality data. However, the first representative panel survey that tracks individual labour-market outcomes (the National Income Dynamics Study) was only launched in 2008. Subsequent to this, the only individual level panel (the Labour Force Survey Panel 2000 – 2004) tracked dwellings. It is

[31]Agriculture, Mining, Food, Beverages & tobacco, Textiles, Clothing, Leather products, Footwear, Wood products, Paper & printing, Petrol refinery, Chemicals, Rubber & plastic, Non-metalic minerals, Basic iron & steel, Basic non-ferrous metals, Metal products, Non-electrical machinery, Electrical machinery, TV & communication, Transport equipment, Furniture, Other manufactures, Electricity, gas & water, Construction, Wholesale & retail, Transport & communications, Finance, insurance and other business services, Other services

therefore limited to those individuals that did not leave these dwelling while they were in the sample frame. This constrains the analysis of the dynamics of employment and earnings.

Fortunately, Kerr, Lam, and Wittenberg (2013) have constructed the Post-Apartheid Labour Market Series 1994-2012 (PALMS) by stacking the cross sectional datasets created from 39 labour-market surveys conducted by Statistics South Africa between 1994 and 2012. These include the October Household Surveys from 1994 to 1999 and the bi-annual Labour Force Surveys from 2000-2007, including the smaller LFS pilot survey from February 2000, and the Quarterly Labour Force surveys from 2008 until 2012. PALMS allows us to, at the very least, explore the relationship between labour-market earnings and employment sector, education in employment and skills over this period.

There are several caveats. The dataset includes cross-entropy weights that were constructed for the series because the weights presented in the original cross-sections "are problematic for analyses over time, for two main reasons: First, the auxiliary data used as a benchmark in the post-stratification adjustment are unreliable and inconsistent over time and hence result in temporal inconsistencies even at the aggregate level. Second, since the adjustments were made at the person level until 2003, there is no hierarchical consistency between the person and household weighted series until 2003. Thus estimates at the household and person level may disagree." (Kerr, Lam, and Wittenberg, 201:6) The cross-entropy weights "result in consistent demographic and geographic trends and can be used at both the person and household level." 2012 (Kerr, Lam, and Wittenberg, 2013: 6). Second, there is no data on the sector of employment prior to 1996 and there is also no earnings data prior to 1997 and from 2008 to 2009. Finally, that unequal spacing between the different cross-sections places additional demands on any pooled data regression specification of these relationships.

Model and results

Verbeek (2008) outlines the identifying restrictions for consistent estimation of the population parameters of interest in models that use the average value of both the dependent and explanatory variables for the individuals in a cohort. In particular, pseudo-panels are susceptible to measurement error. Each cohort in a pseudo-panel should therefore have a large number of individual observations[32]. The cohorts should also be exogenous and stable over time. This excludes, for example, using province-birth cohorts in South Africa.

More than 99% of the observations in the birth-cohort pseudo-panel we construct from the PALMS data for male- and separately for female- African South Africans aged 20 to 60 born from 1940 to 1992 have at least 120 observations (and on average more than 400 observations) in each time period. Since there is no wage data for the eight QLFS surveys from 2008 and 2009 and the single QLFS in 2012, and the different surveys are unequally spaced, the estimates from a standard fixed-effect estimator will

[32] Although there is neither consensus on what sufficiently large is nor on the asymptotics that should be used to demonstrate the consistency of these models.

be inconsistent. We follow Baltagi and Wu's (1999) approach to unequally spaced- and unbalanced panel fixed-effects regressions with AR (1) disturbances when we model the first, second (i.e. the median) and third earnings quartiles within cohorts as a function of the proportion of these birth-cohorts that are employed in an occupation in a particular sector:

$$\mathrm{Y}_{qct} = a + \Sigma\beta_{o/s,ct}\left(\frac{E_{o/s,ct}}{N_{ct}}\right) + \tau\boldsymbol{X}_{ct} + \gamma\alpha_{ct} + \rho\varepsilon_{c,t-1} + \varepsilon_{ct}$$

Y_{qct} is the log earnings quartile *q* for the cohort *c* in period *t*,

$\frac{E_{o/s,ct}}{N_{ct}}$ is the proportion of the cohort c population (N_{ct}) that is employed (E) in an occupation in a sector (o/s) in period *t*,

$\boldsymbol{X}_{ct}$ includes the age, the mean education of the employed, and the proportion of the cohort *c* that it not economically active in period *t*, and

α_{ct} is the fixed-effect for cohort *c*.

We collapse those occupations in $E_{o/s}$ with fewer than 6000 individual data-points into an "Other" sector-occupations category, and exclude the proportion of the cohort population that is unemployed in the period. This allows us to interpret the coefficients $\beta_{o/s,ct}$ as a percentage-point increase in employment, relative to a percentage-point decrease in the proportion of the cohort that is searching unemployed (holding the proportion employed in other sector-occupation combinations and the proportion of the cohort that is not economically active constant). We also collapse elementary and domestic worker into a single occupation, and skilled agriculture into the technical occupation (see Figure and). The results are presented in table 16 below.

Table 16: Birth-cohort pseudo-panel fixed-effects regression with AR(1) error

	African male log earnings quartile			African female log earnings quartile		
	First	Second	Third	First	Second	Third
Proportion of cohort population						
in occupations within sector:						
Self employed						

Senior	0.010	0.013**	0.019***	0.013	0.006	0.030*
	(0.006)	(0.005)	(0.005)	(0.013)	(0.013)	(0.018)
Technical	0.001	0.001	-0.004	0.016***	0.017***	0.019***
	(0.004)	(0.004)	(0.004)	(0.003)	(0.003)	(0.004)
Service assistant	-0.020***	-0.007	0.001	0.020***	0.018***	0.003
	(0.006)	(0.005)	(0.005)	(0.006)	(0.006)	(0.007)
Trade	-0.011**	-0.019***	-0.013***	-0.004	-0.007	-0.014
	(0.005)	(0.004)	(0.004)	(0.008)	(0.008)	(0.010)
Elementary	-0.015***	-0.006	-0.008*	-0.013***	-0.012***	-0.015***
	(0.005)	(0.004)	(0.004)	(0.004)	(0.004)	(0.005)
Private Households						
Elementary	-0.018***	-0.014***	-0.012***	0.004	-0.004	-0.023***
	(0.005)	(0.004)	(0.004)	(0.003)	(0.003)	(0.004)
Agriculture						
Operator	-0.023***	-0.025***	-0.021***	0.033	0.004	-0.021
	(0.008)	(0.007)	(0.007)	(0.051)	(0.052)	(0.069)
Elementary	-0.026***	-0.015***	-0.014***	0.005	-0.011	-0.012
	(0.005)	(0.005)	(0.005)	(0.007)	(0.007)	(0.010)
Mining						
Trade	0.031***	0.019***	0.004	0.072	0.080	0.147
	(0.006)	(0.006)	(0.005)	(0.067)	(0.067)	(0.089)
Operators	0.022***	0.011**	0.001	-0.040	0.002	0.052
	(0.005)	(0.004)	(0.004)	(0.067)	(0.067)	(0.090)
Elementary	-0.007	0.001	-0.005	0.050	-0.020	0.026
	(0.008)	(0.007)	(0.007)	(0.038)	(0.038)	(0.051)

Manufacturing						
Trade	0.014***	0.007	0.003	0.009	0.019*	0.002
	(0.005)	(0.005)	(0.005)	(0.010)	(0.010)	(0.014)
Operators	0.009**	0.009**	0.002	0.007	0.002	0.003
	(0.004)	(0.004)	(0.004)	(0.009)	(0.009)	(0.012)
Elementary	0.026***	0.011**	-0.000	0.026***	0.026***	0.019
	(0.006)	(0.005)	(0.005)	(0.009)	(0.009)	(0.012)
Construction and Utilities						
Trade	0.012***	0.008**	0.001	0.009	-0.001	-0.009
	(0.004)	(0.003)	(0.003)	(0.020)	(0.020)	(0.026)
Elementary	0.008	0.002	-0.008	-0.021*	0.021	0.040**
	(0.006)	(0.005)	(0.005)	(0.013)	(0.013)	(0.017)
Sales						
Clerks	0.001	0.005	0.011	0.020***	0.028***	0.018*
	(0.009)	(0.009)	(0.008)	(0.008)	(0.008)	(0.011)
Service assistant	0.011*	0.008	0.007	0.022***	0.026***	0.021**
	(0.006)	(0.005)	(0.005)	(0.006)	(0.006)	(0.009)
Trade	0.012*	-0.004	-0.009*	0.046***	0.047***	0.017
	(0.006)	(0.006)	(0.006)	(0.014)	(0.014)	(0.018)
Elementary	0.018***	0.003	0.002	0.023***	0.026***	0.019*
	(0.006)	(0.006)	(0.006)	(0.008)	(0.008)	(0.010)
Other services						
Operators	0.013**	0.010**	-0.000	0.038	0.066**	0.071*
	(0.005)	(0.005)	(0.004)	(0.028)	(0.028)	(0.037)

Elementary	0.010	0.003	-0.005	0.014	0.010	-0.002
	(0.007)	(0.007)	(0.007)	(0.012)	(0.012)	(0.016)
Capital services						
Service assistant	0.008	0.001	-0.008*	0.006	0.020	0.035
	(0.005)	(0.005)	(0.005)	(0.019)	(0.019)	(0.026)
Elementary	0.019**	-0.005	-0.007	0.004	0.009	-0.007
	(0.009)	(0.008)	(0.007)	(0.009)	(0.009)	(0.012)
Public administration						
Clerks	-0.008	0.007	0.005	0.010	0.010	0.053***
	(0.011)	(0.010)	(0.009)	(0.013)	(0.013)	(0.018)
Service assistant	0.012*	0.013**	0.027***	0.007	0.006	0.043*
	(0.007)	(0.006)	(0.006)	(0.020)	(0.020)	(0.026)
Elementary	0.026***	0.018***	0.004	0.031**	0.024*	0.035**
	(0.007)	(0.006)	(0.006)	(0.013)	(0.013)	(0.017)
Education						
Professional	0.018	0.013	0.014	0.001	0.009	0.036***
	(0.011)	(0.010)	(0.009)	(0.008)	(0.008)	(0.011)
Technical	-0.009	-0.005	0.007	-0.008	-0.002	0.033***
	(0.008)	(0.007)	(0.007)	(0.006)	(0.006)	(0.008)
Elementary	-0.013	-0.030**	-0.025**	-0.003	0.016	-0.007
	(0.014)	(0.013)	(0.012)	(0.014)	(0.014)	(0.019)
Health						
Technical	0.013	0.012	0.010	-0.003	0.003	0.028***
	(0.015)	(0.014)	(0.013)	(0.008)	(0.008)	(0.011)

Elementary	-0.002	-0.002	-0.008	-0.011	0.004	0.027**
	(0.015)	(0.013)	(0.013)	(0.009)	(0.009)	(0.012)
Other sector-occupations						
Senior	-0.004	-0.001	0.001	-0.000	-0.000	0.020
	(0.005)	(0.005)	(0.005)	(0.010)	(0.010)	(0.013)
Professional	0.010	0.003	0.020***	-0.003	0.006	0.003
	(0.007)	(0.006)	(0.006)	(0.007)	(0.008)	(0.010)
Technical	-0.003	-0.003	0.005	0.014	0.019**	0.037***
	(0.004)	(0.004)	(0.004)	(0.009)	(0.009)	(0.012)
Clerks	0.013**	0.014**	0.014**	0.006	0.020***	0.031***
	(0.007)	(0.006)	(0.006)	(0.007)	(0.007)	(0.009)
Service assistant	0.023***	0.015***	0.002	-0.005	0.011	0.013
	(0.006)	(0.005)	(0.005)	(0.007)	(0.007)	(0.009)
Trade	0.026***	0.016**	0.019***	0.011	0.033	0.117***
	(0.007)	(0.006)	(0.006)	(0.027)	(0.027)	(0.036)
Operators	0.008*	0.003	0.007*	0.033**	0.019	-0.014
	(0.004)	(0.004)	(0.004)	(0.015)	(0.015)	(0.020)
Proportion of cohort population						
that is not economically active	0.002	0.001	0.002	0.007***	0.008***	0.007***
	(0.002)	(0.001)	(0.001)	(0.002)	(0.002)	(0.002)
Mean years of education						
in employment	0.441***	0.553***	0.503***	0.353***	0.436***	0.442***
	(0.049)	(0.040)	(0.038)	(0.041)	(0.040)	(0.053)
Mean years of education						
in employment squared	-0.023***	-0.030***	-0.028***	-0.012***	-0.019***	-0.020***

	(0.003)	(0.003)	(0.003)	(0.003)	(0.003)	(0.004)
Age	0.099***	0.133***	0.162***	0.104***	0.116***	0.129***
	(0.012)	(0.010)	(0.010)	(0.010)	(0.010)	(0.013)
Age squared	-0.001***	-0.001***	-0.002***	-0.001***	-0.001***	-0.001***
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
Constant	1.838***	1.638***	1.669***	0.625***	1.007***	1.793***
	(0.294)	(0.216)	(0.181)	(0.174)	(0.158)	(0.180)
Observations	1,049	1,049	1,049	1,049	1,049	1,049
Number of cohorts	52	52	52	52	52	52

*Standard errors in parentheses. *** p<0.01, ** p<0.05, * p<0.1. The proportion ($\frac{U_{ct}}{N_{ct}}$) of cohort c that is unemployed (U) in period t is omitted.*

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Appendix C: Additional graphs of *Changes in labour market* section

Figure 40: Proportion of male birth-cohort

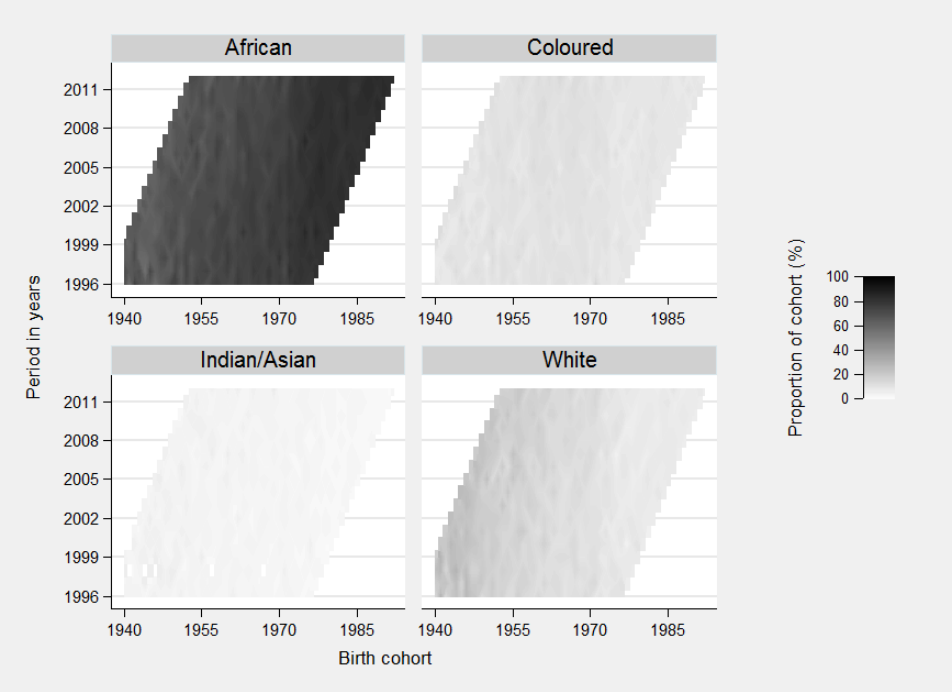

Figure 41: Proportion of female birth-cohort

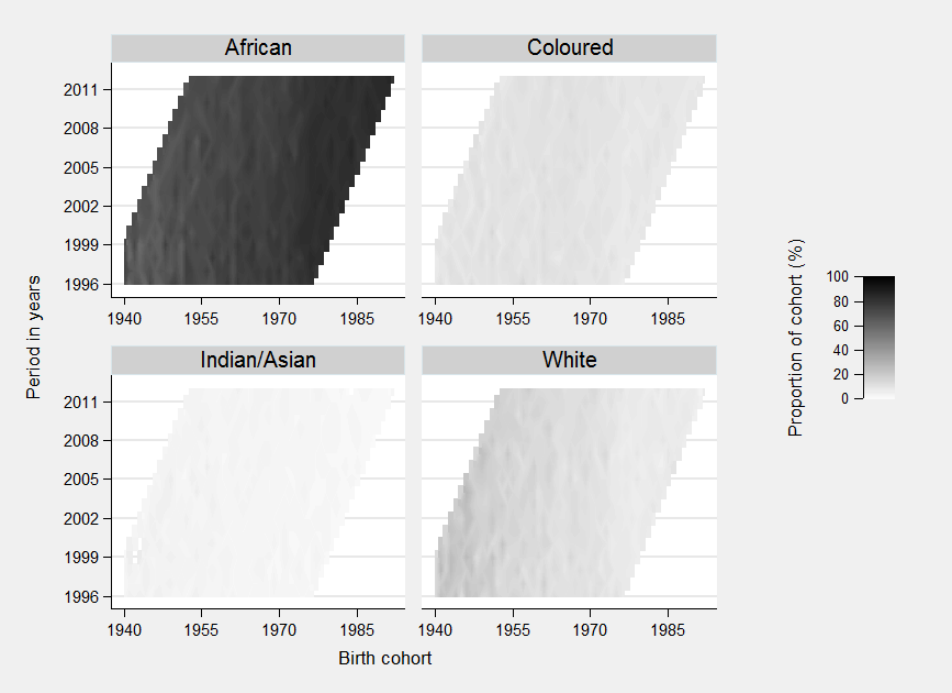

Figure 42: Proportion of non-African male birth-cohort by education

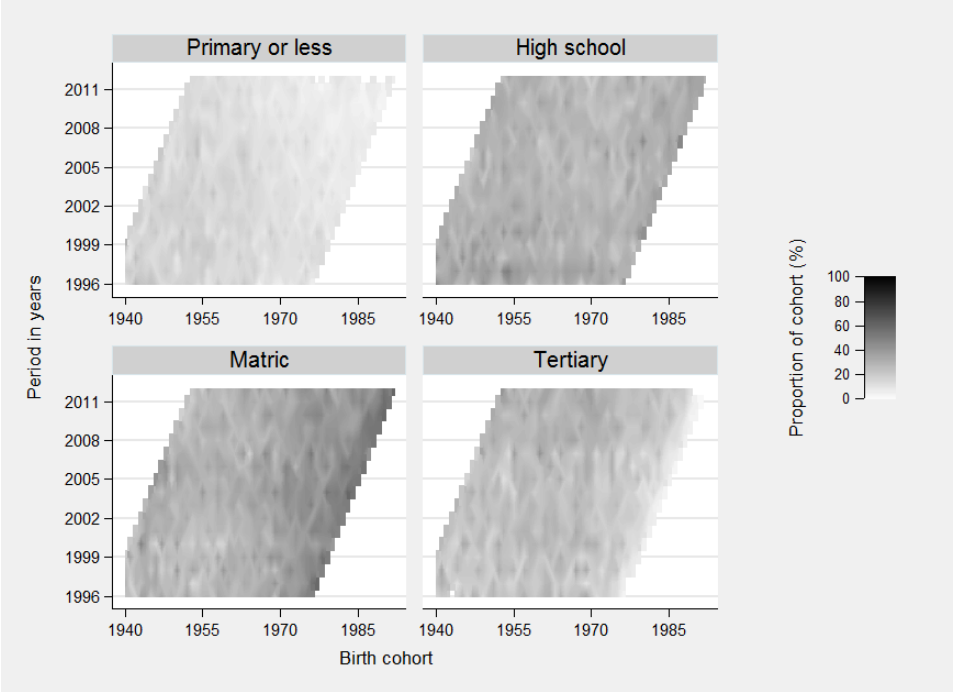

Figure 43: Proportion of non-African female birth-cohort by education

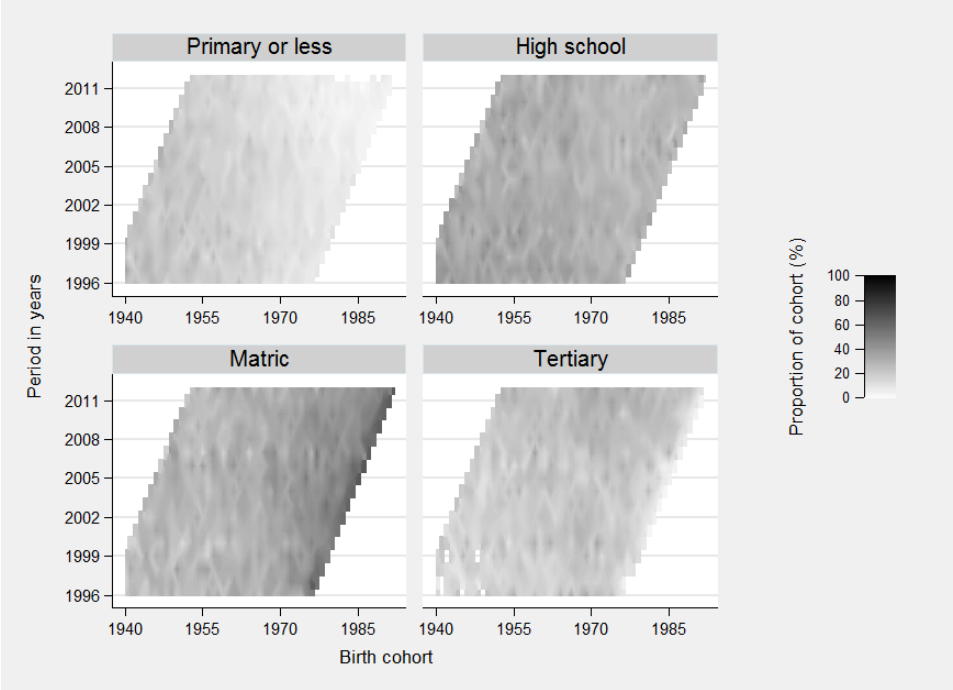

Figure 44: Proportion of African male birth-cohort by education

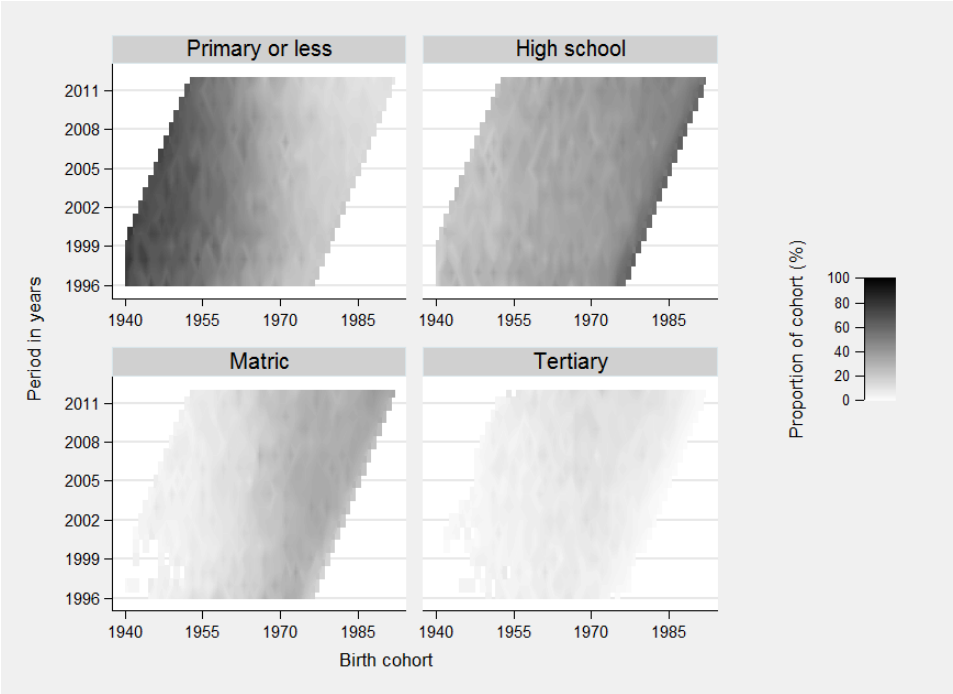

Figure 45: Proportion of African female birth-cohort by education

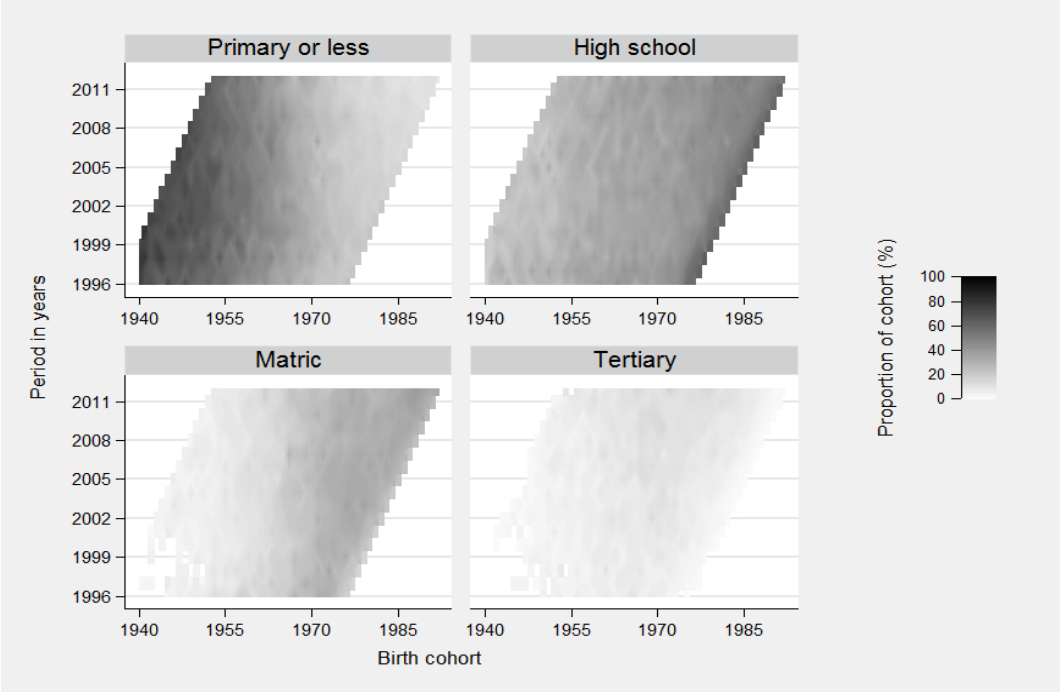

Figure 46: Proportion of non-African male birth-cohort employed by sector

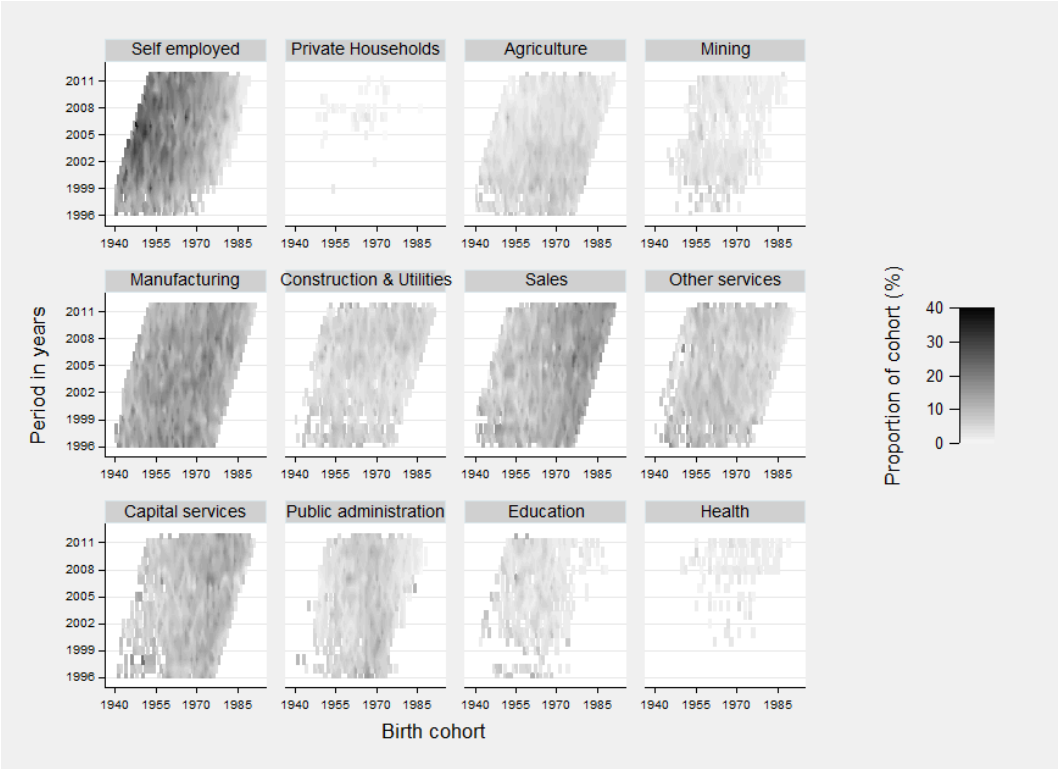

Figure 47: Proportion of non-African female birth-cohort employed by sector

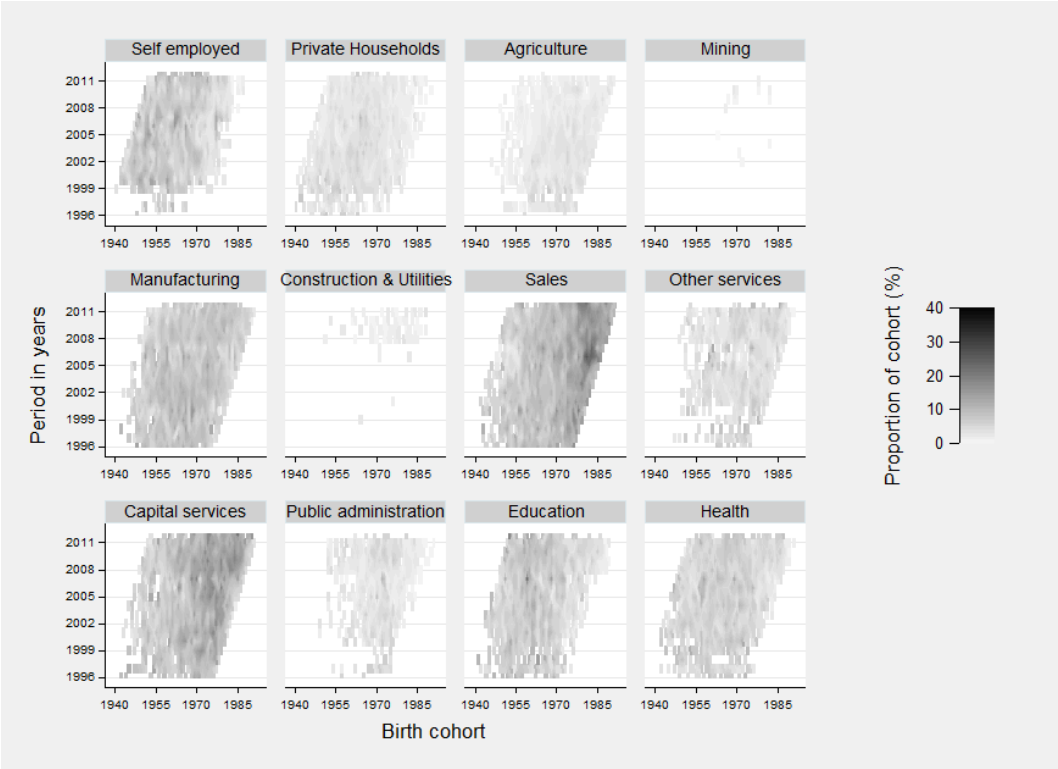

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Figure 48: Proportion of African male birth-cohort employed by sector

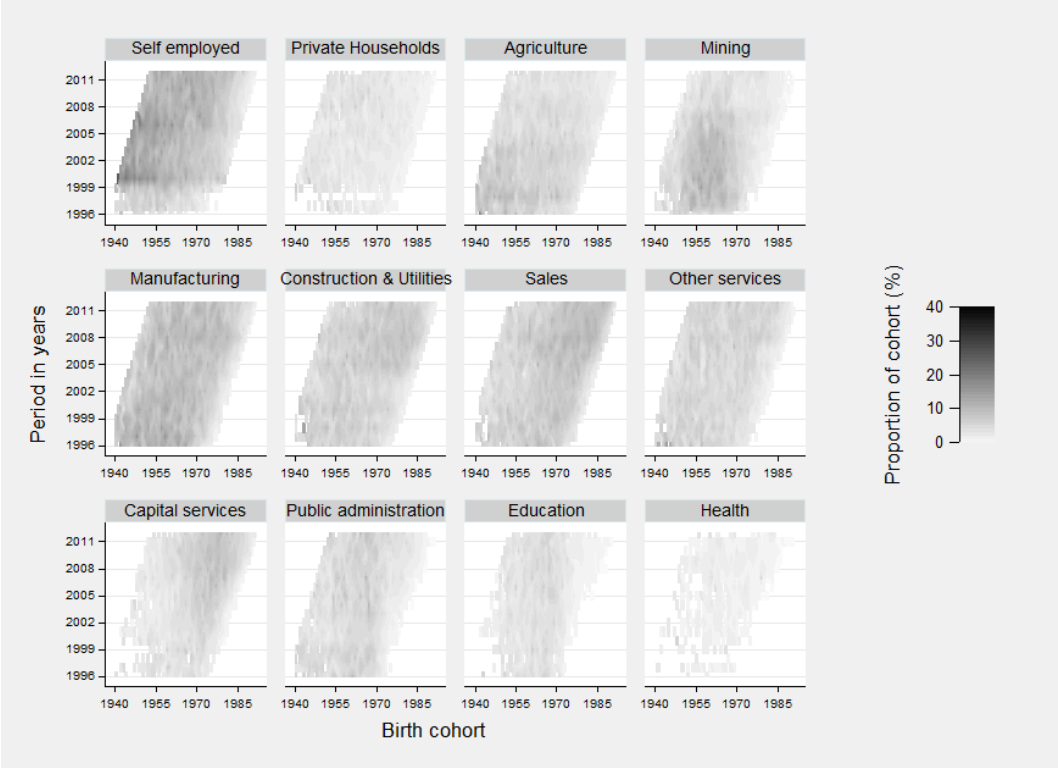

Figure 49: Proportion of African female birth-cohort employed by sector

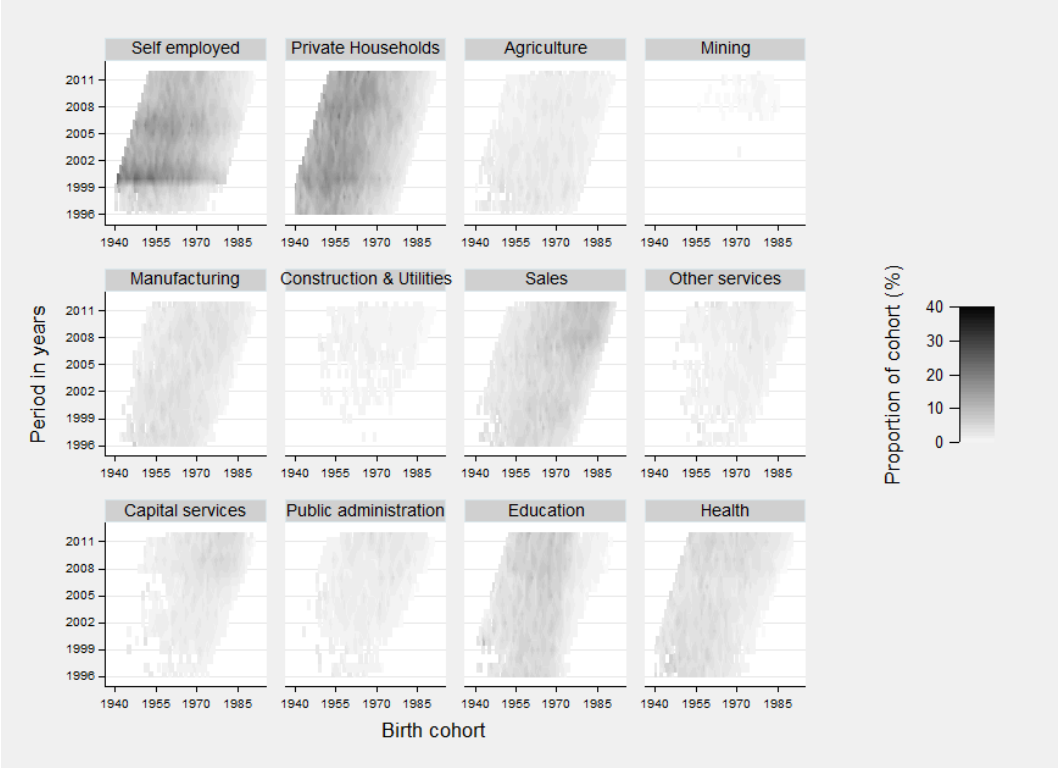

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Figure 50: Proportion of non-African male birth-cohort employed by occupation

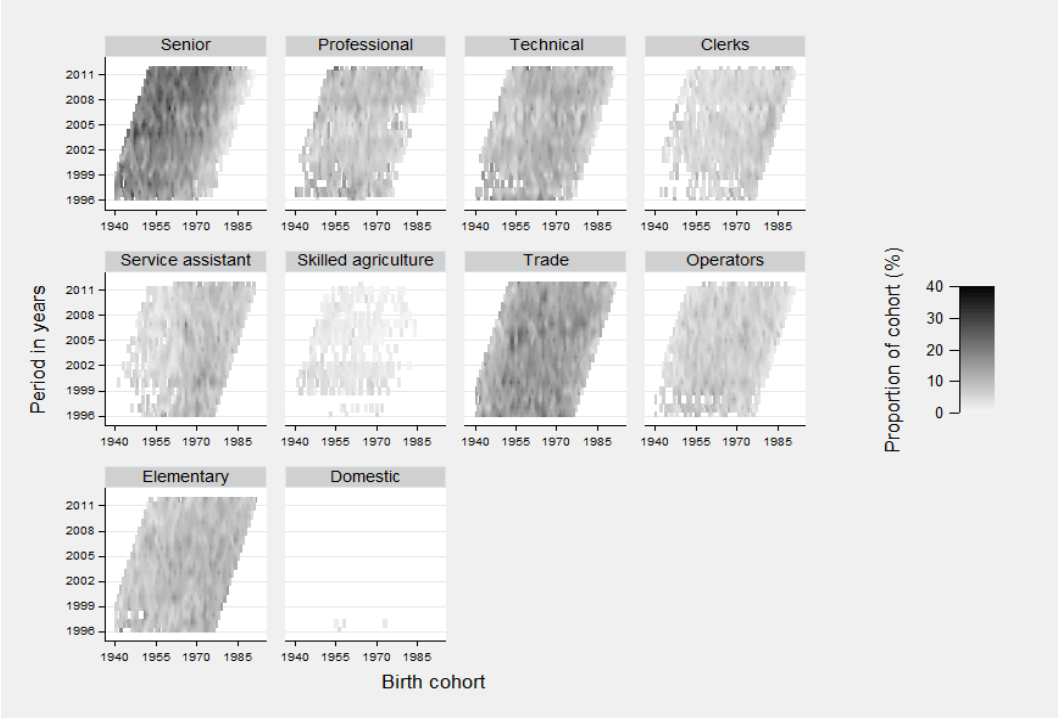

Figure 51: Proportion of non-African female birth-cohort employed by occupation

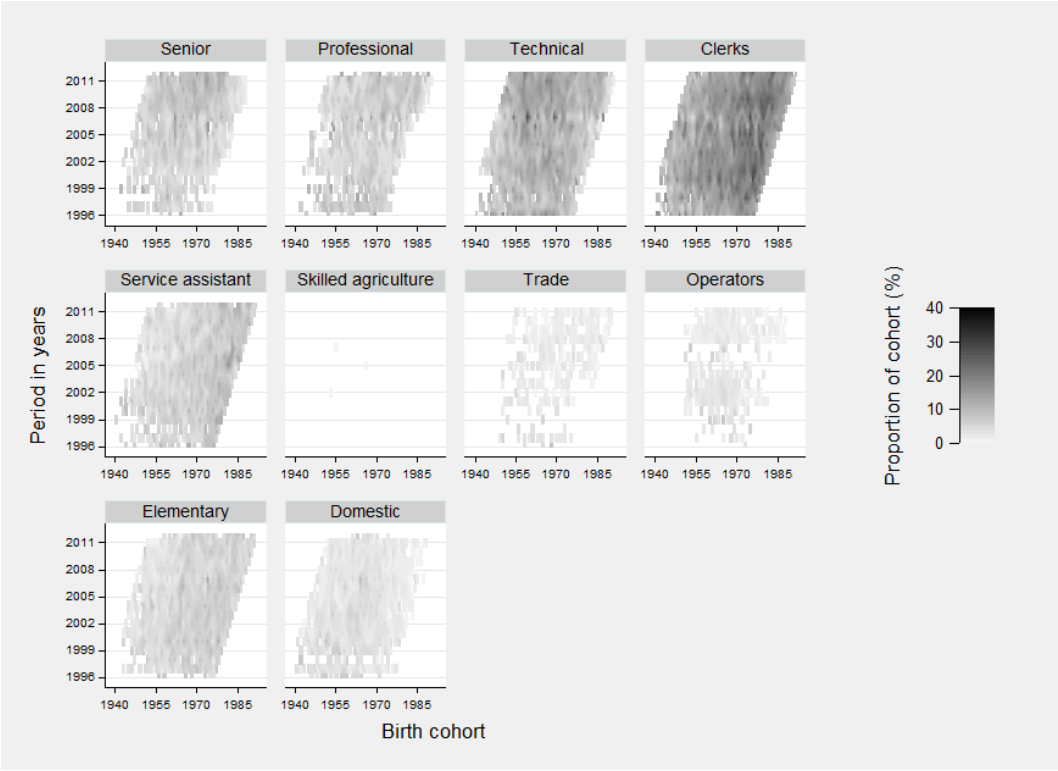

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Figure 52: Proportion of African male birth-cohort employed by occupation

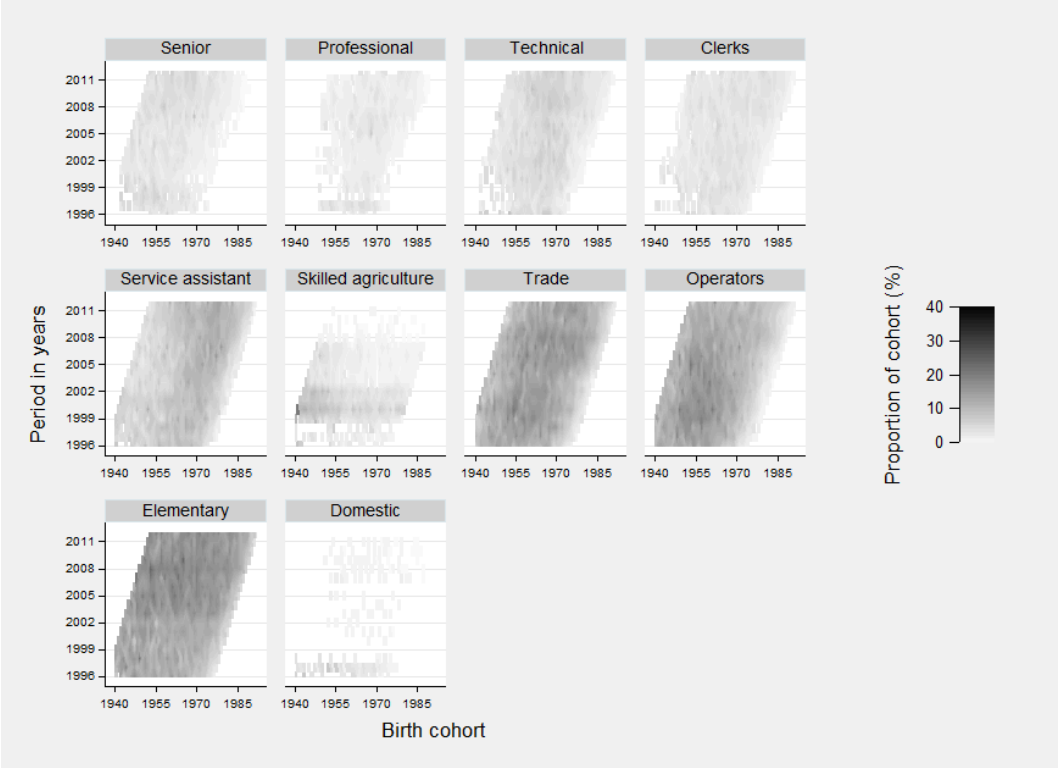

Figure 53: Proportion of African female birth-cohort employed by occupation

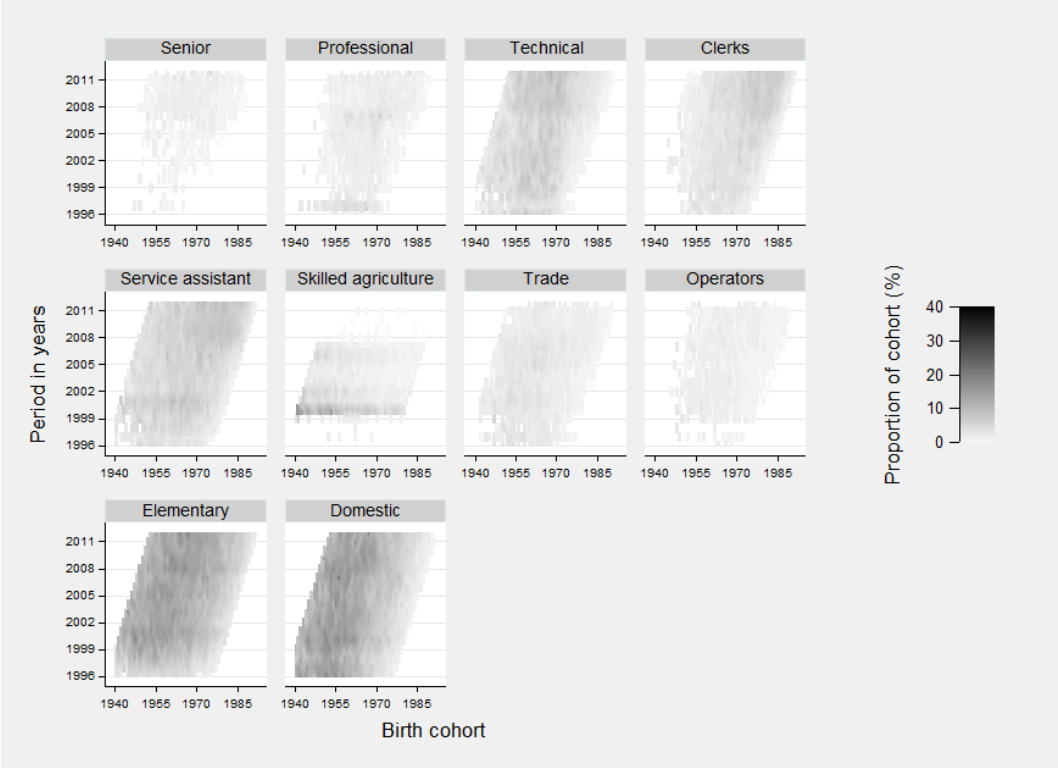

Figure 54: Median real monthly earnings of male birth-cohort

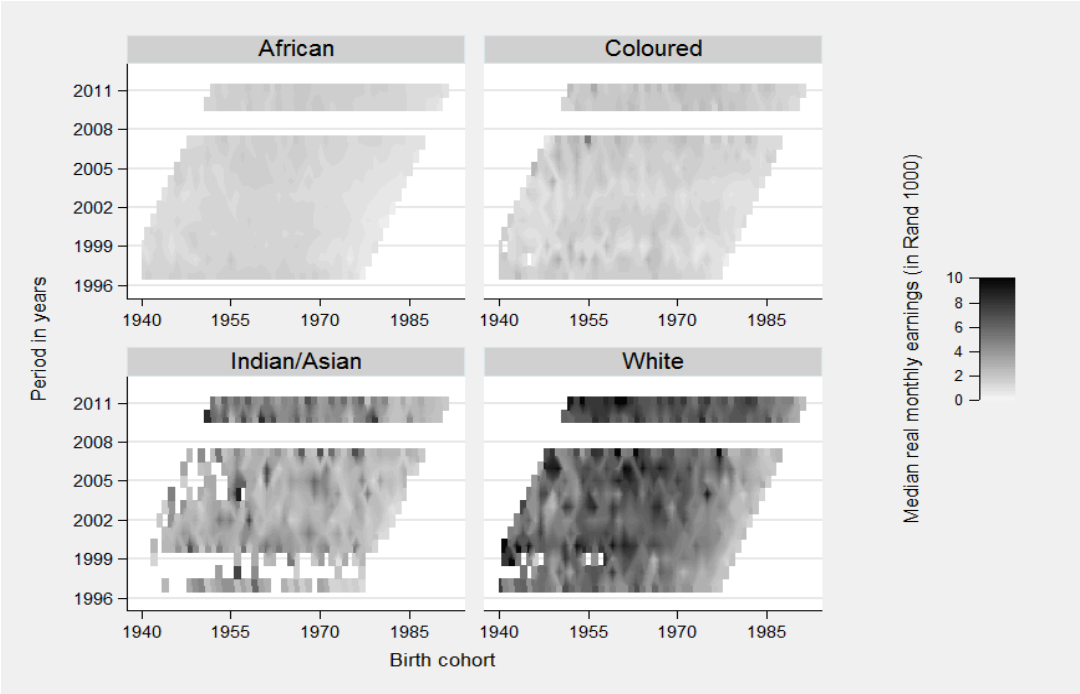

Figure 55: Median real monthly earnings of female birth-cohort

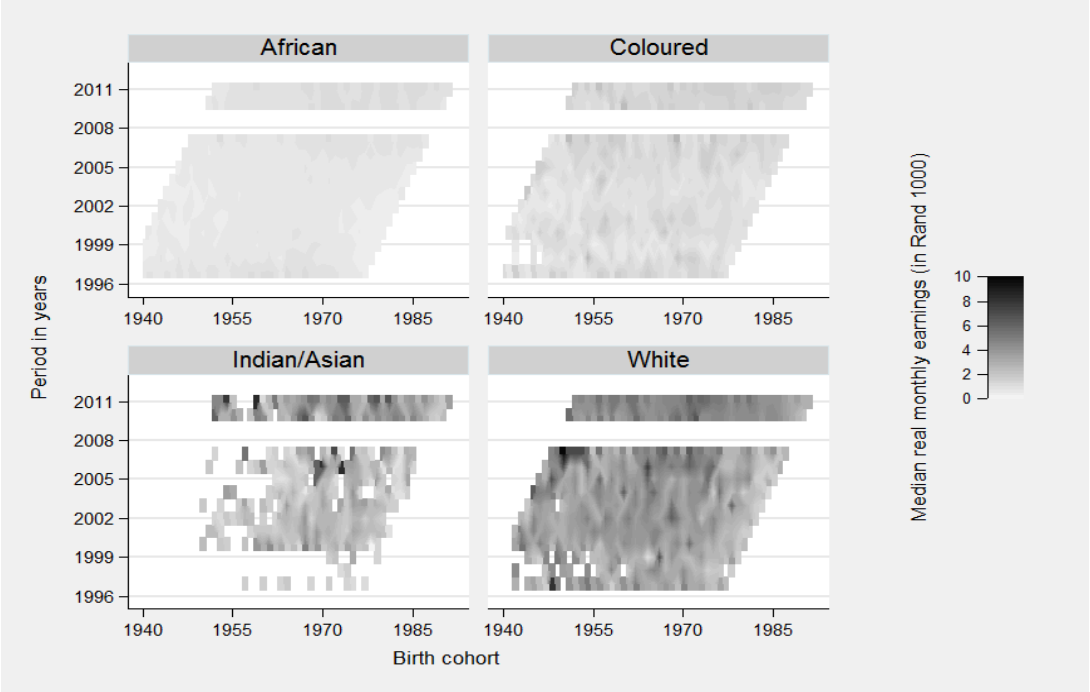

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Figure 56: Median real monthly earnings of non-African male birth-cohort by education

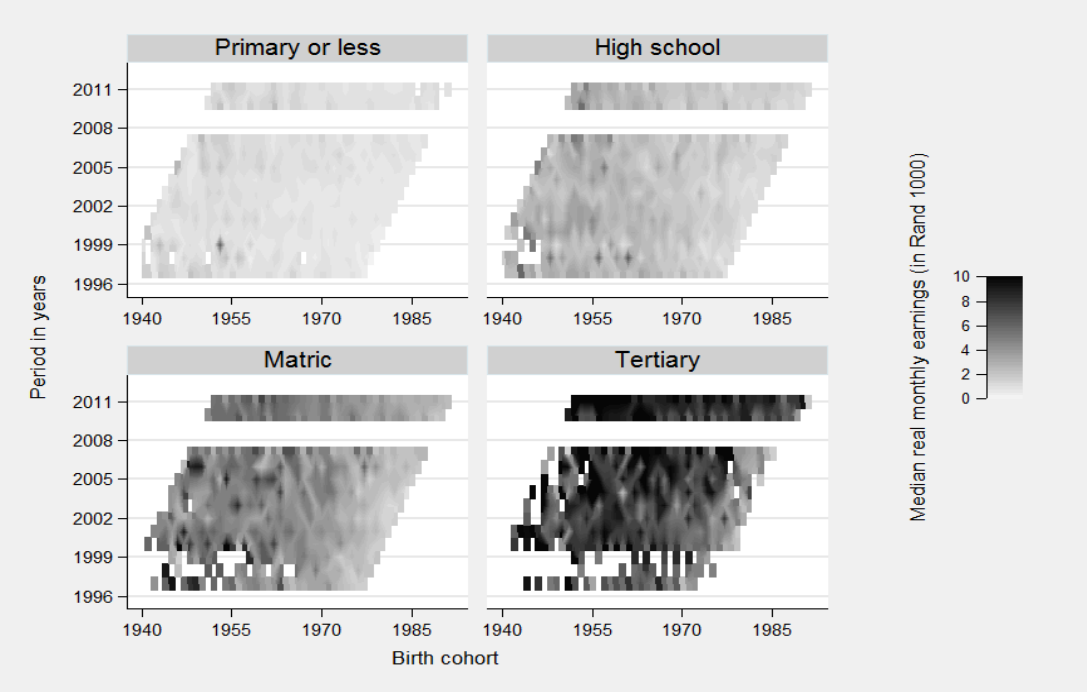

Figure 57: Median real monthly earnings of non-African female birth-cohort by education

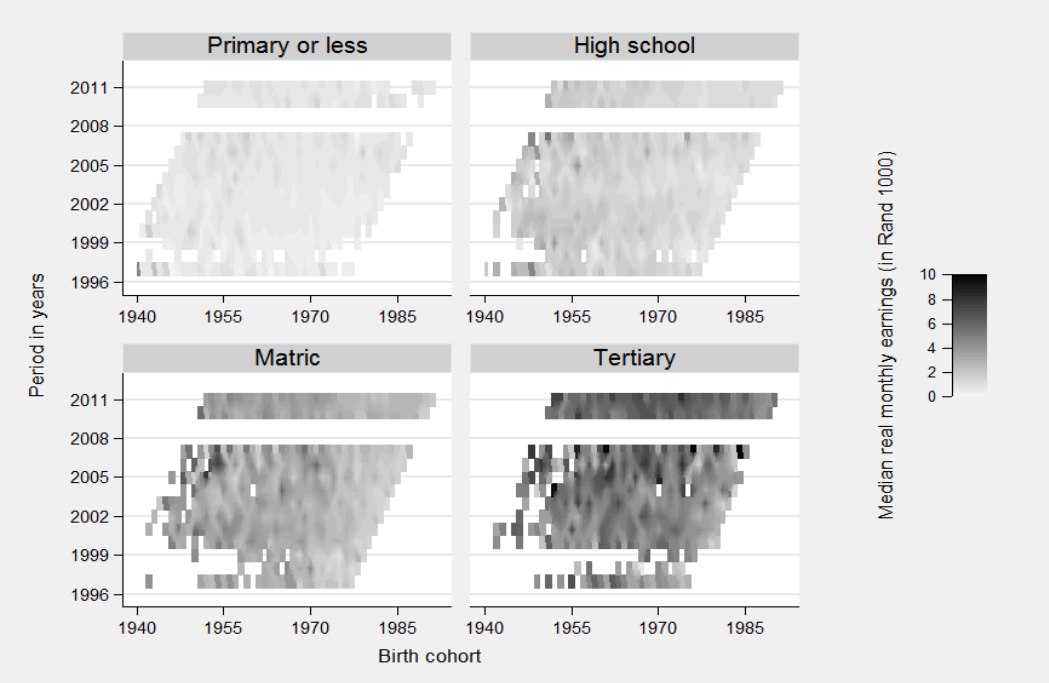

Figure 58: Median real monthly earnings of African male birth-cohort by education

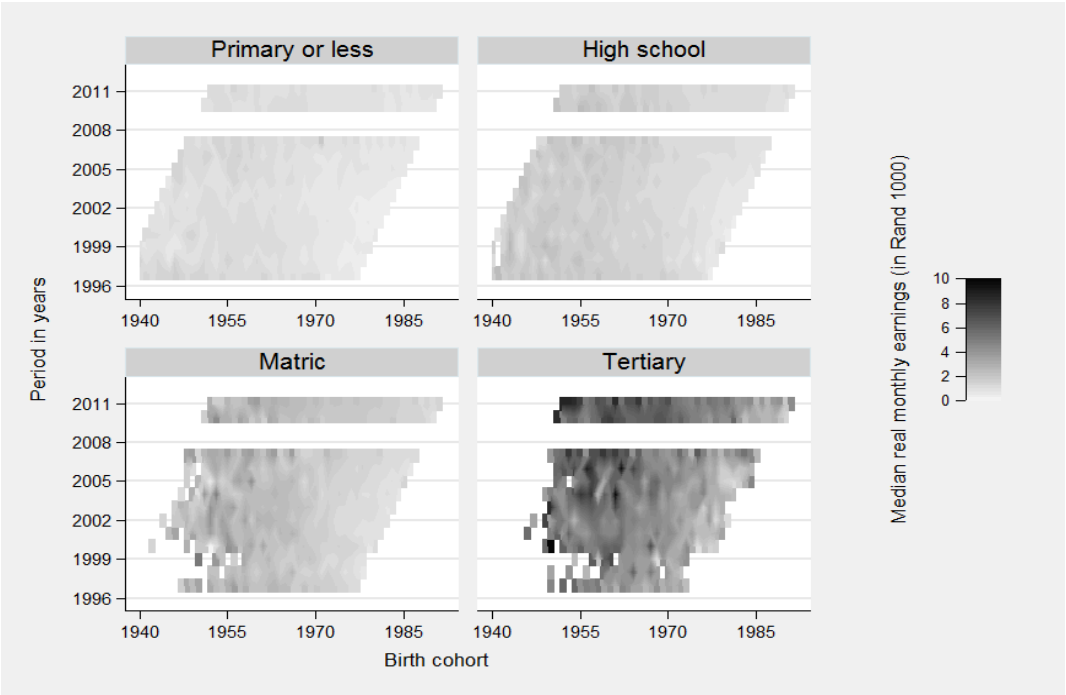

Figure 59: Median real monthly earnings of African female birth-cohort by education

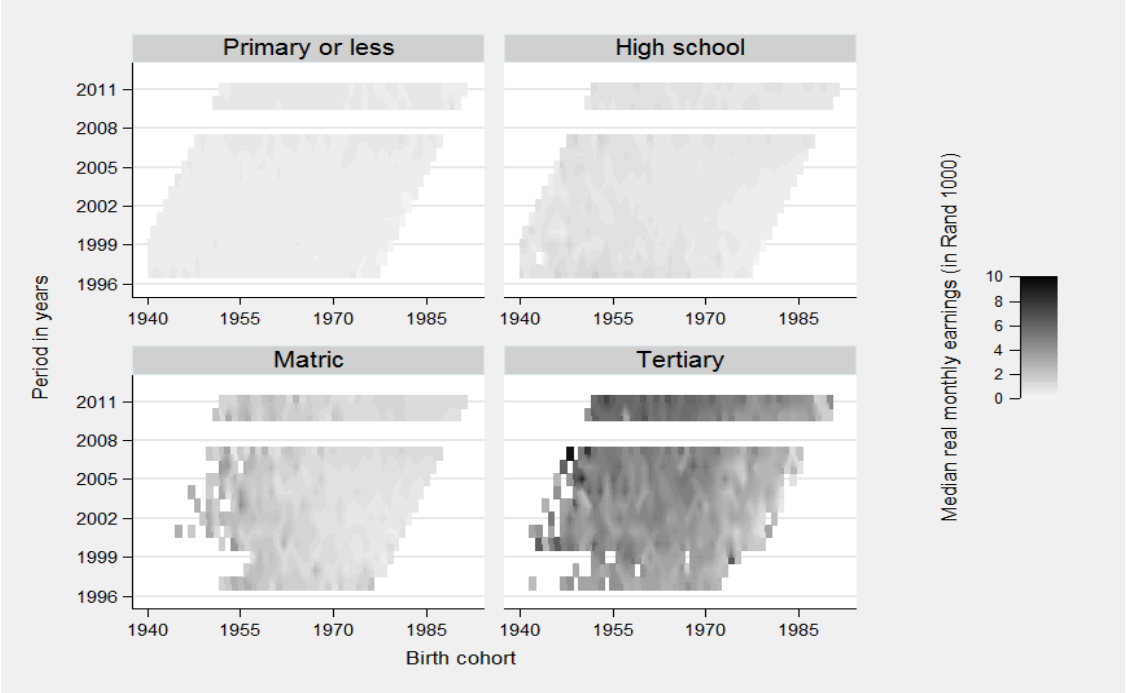

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Figure 60: Median real monthly earnings of non-African male birth-cohort by employment sector

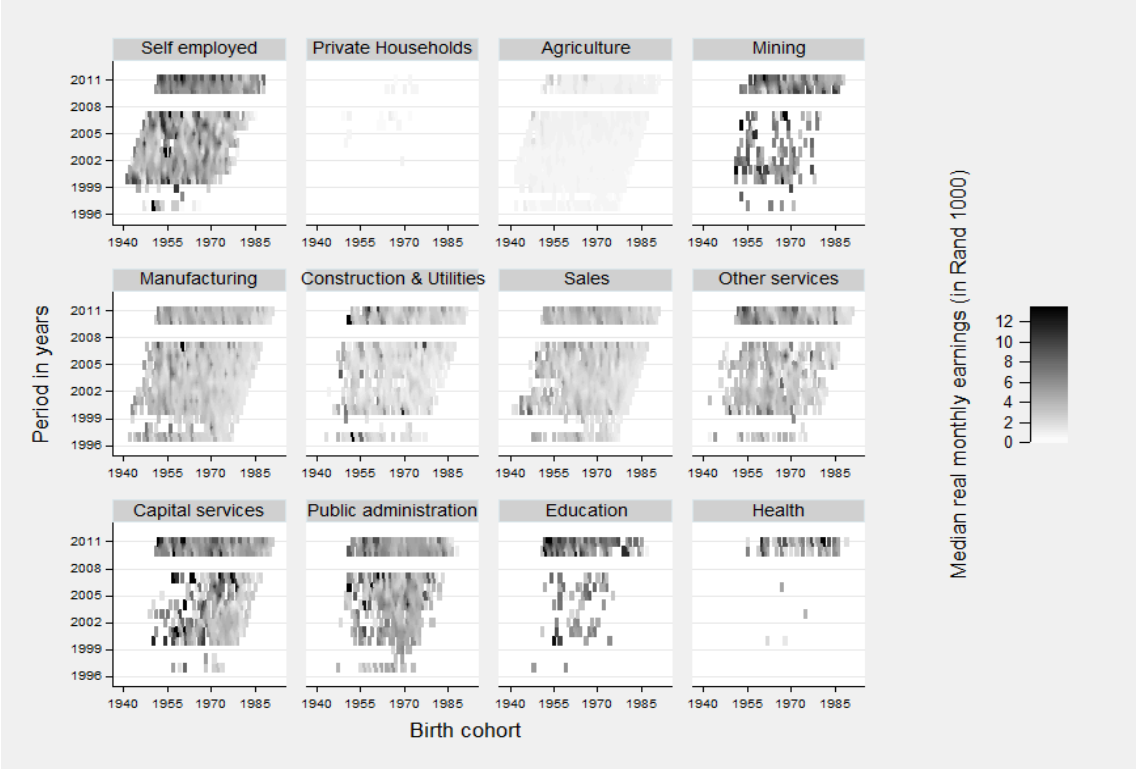


Figure 61: Median real monthly earnings of non-African female birth-cohort by employment sector

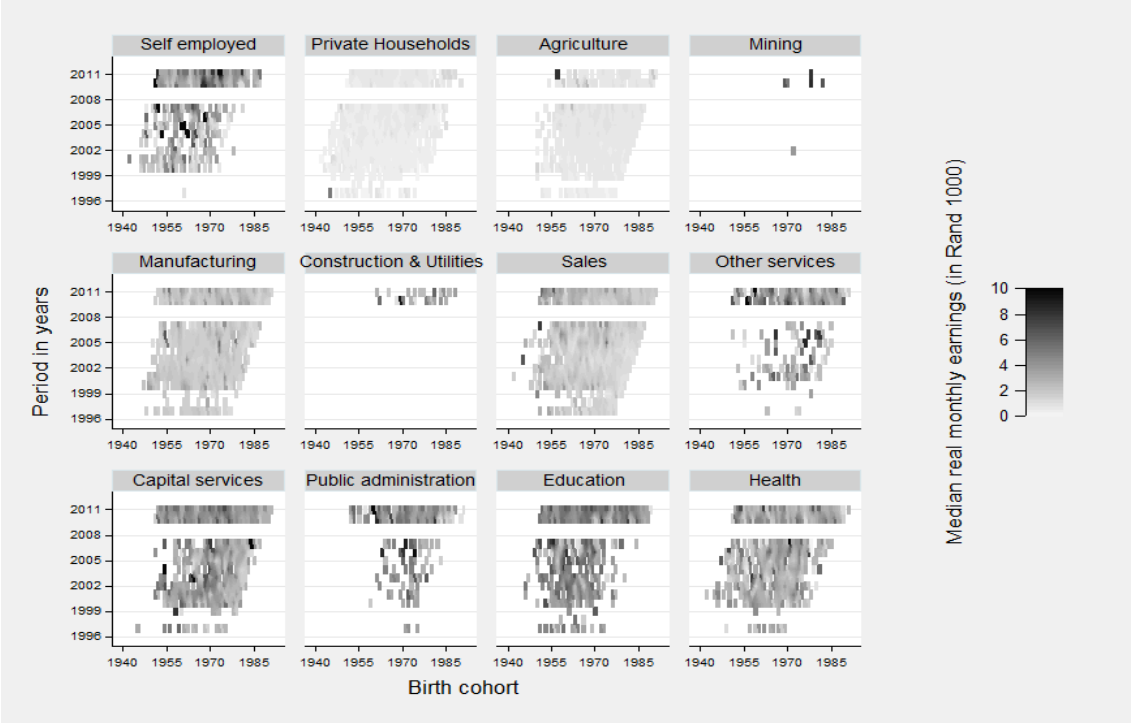


Figure 62: Median real monthly earnings of African male birth-cohort by employment sector

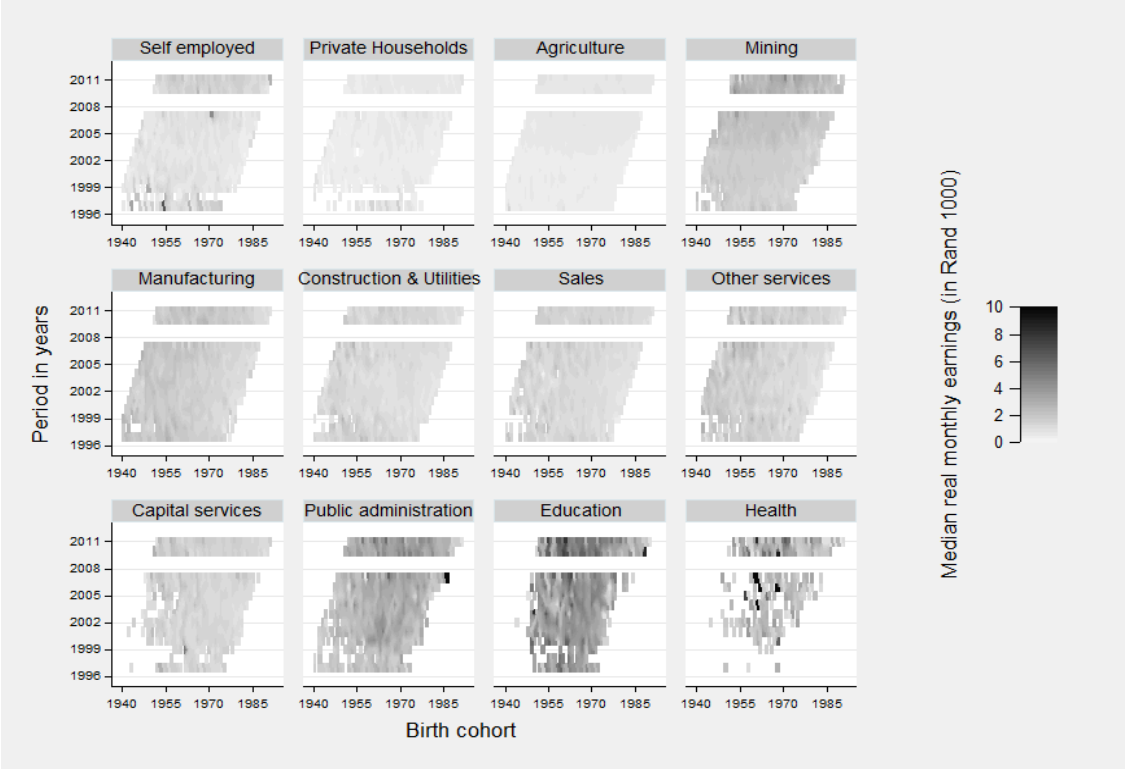


Figure 63: Median real monthly earnings of African female birth-cohort by employment sector

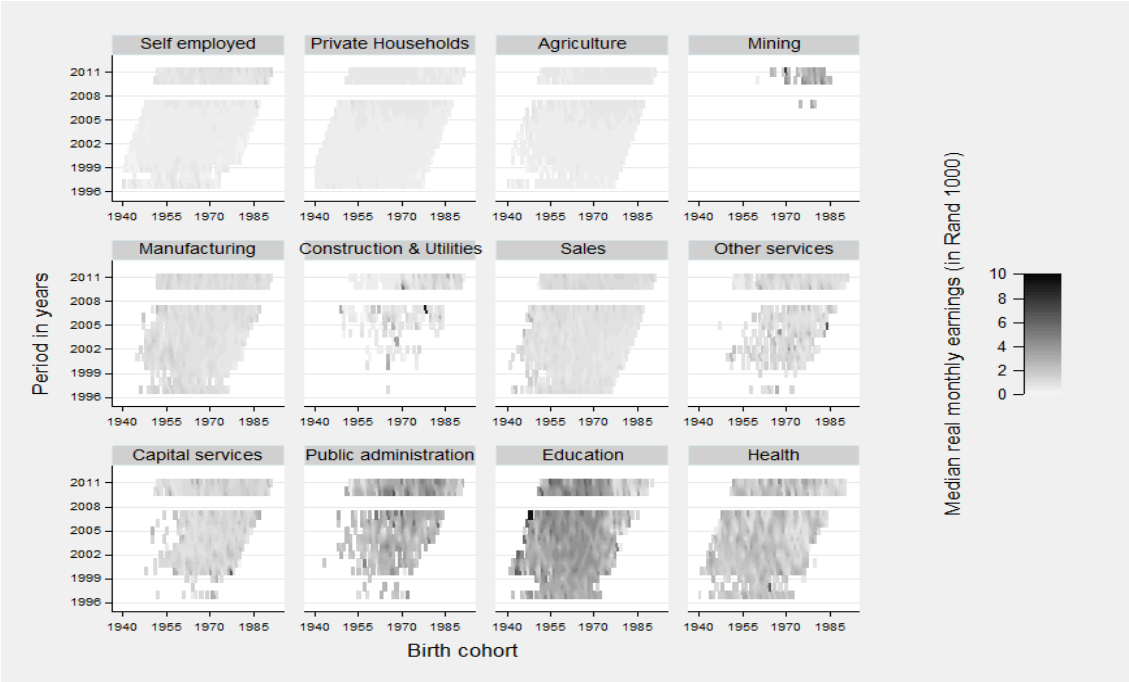


Figure 64: Median real monthly earnings of non-African male birth-cohort by employment occupation

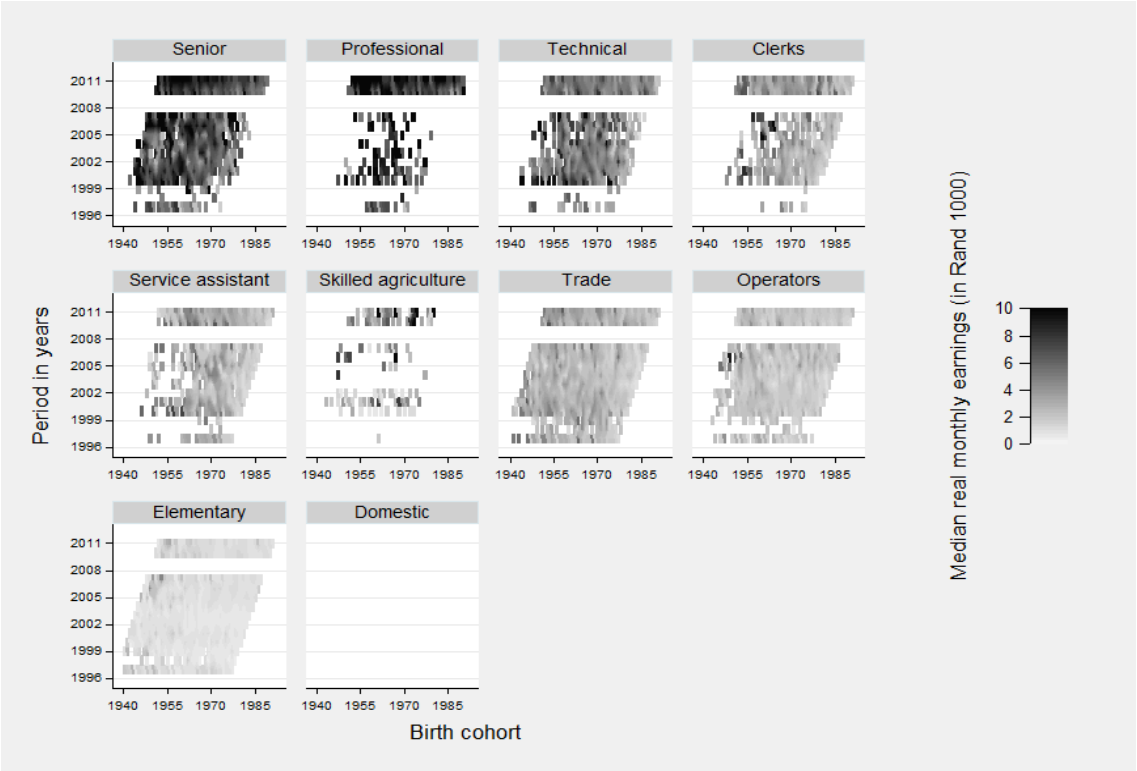


Figure 65: Median real monthly earnings of non-African female birth-cohort by employment occupation

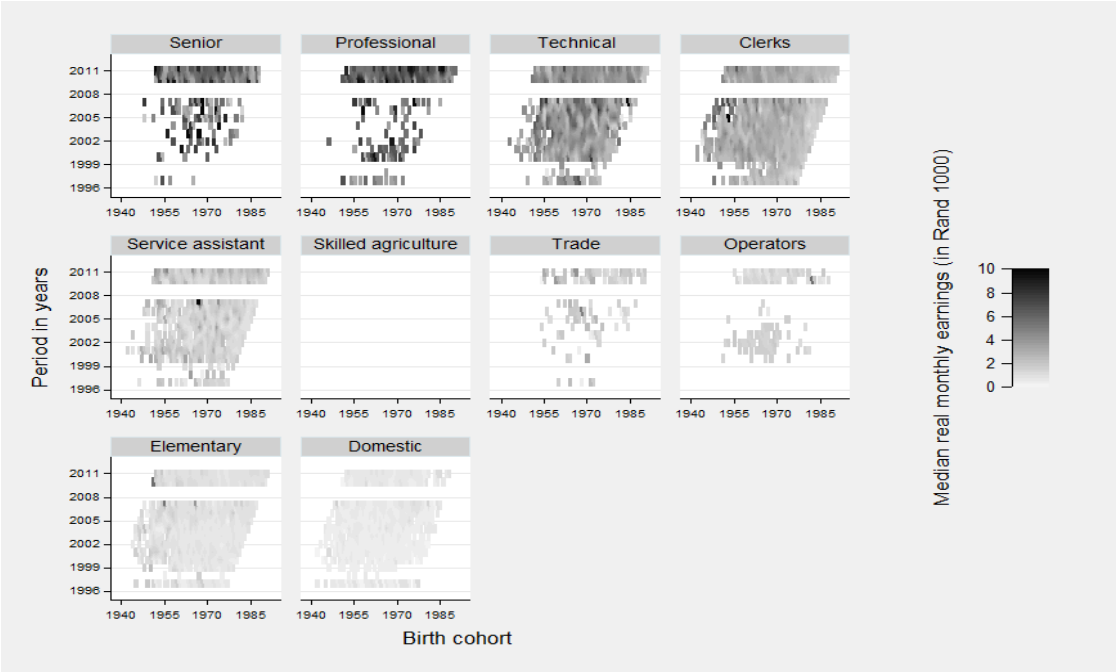


Figure 66: Median real monthly earnings of African male birth-cohort by employment occupation

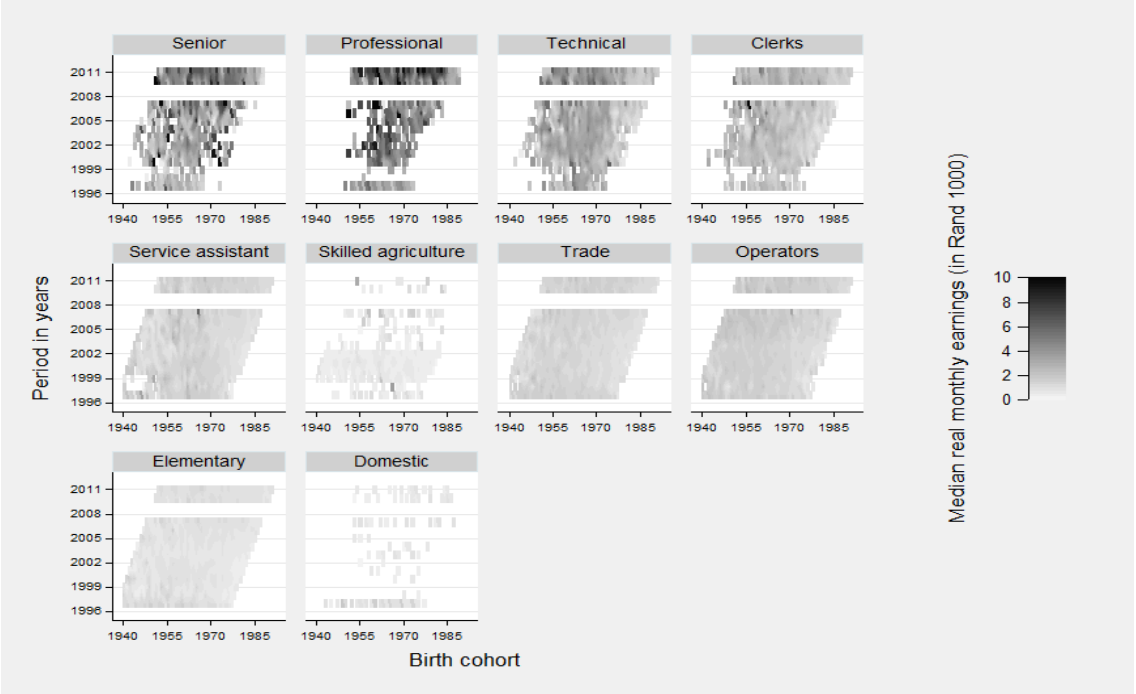


Figure 67: Median real monthly earnings of African female birth-cohort by employment occupation

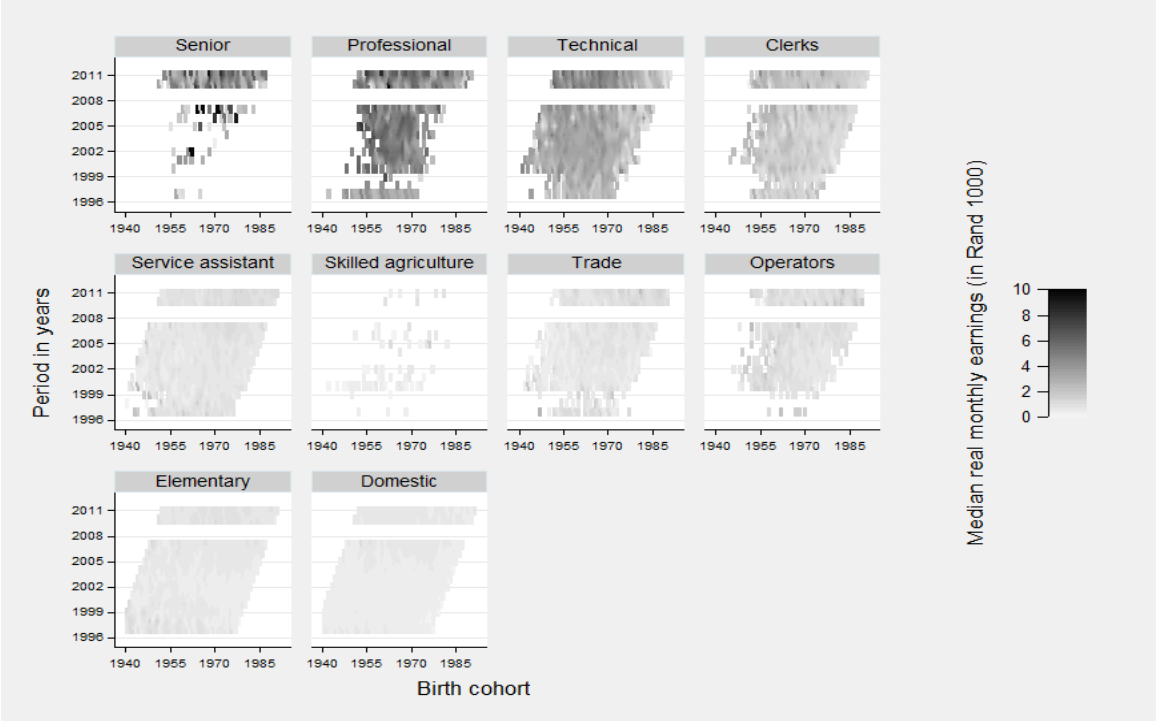


Figure 68: Africans employed as operators in the manufacturing sector, as a proportion of birth-cohort

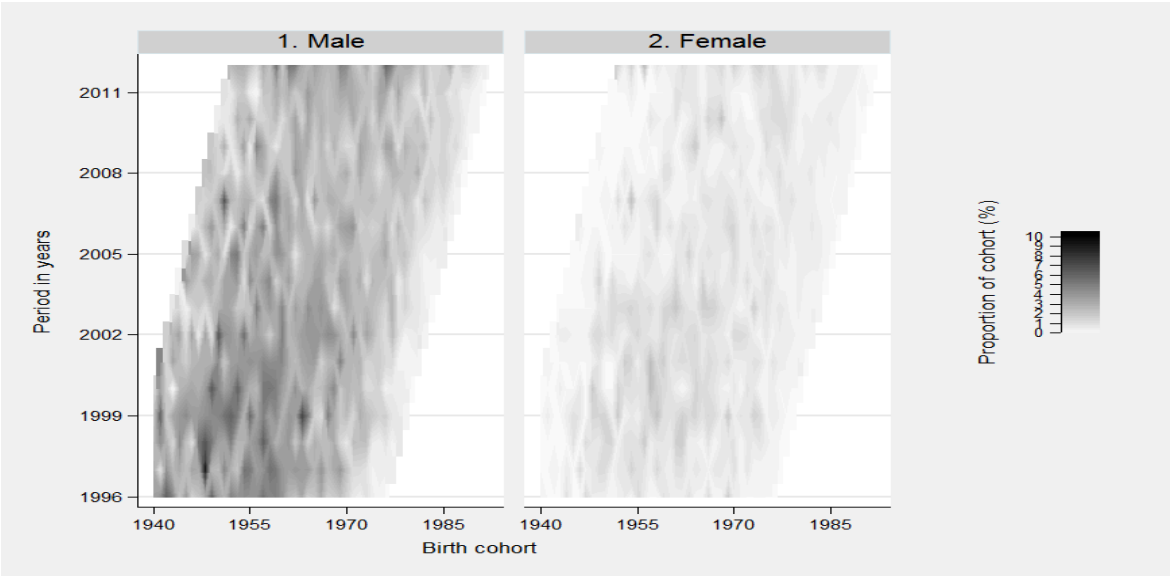
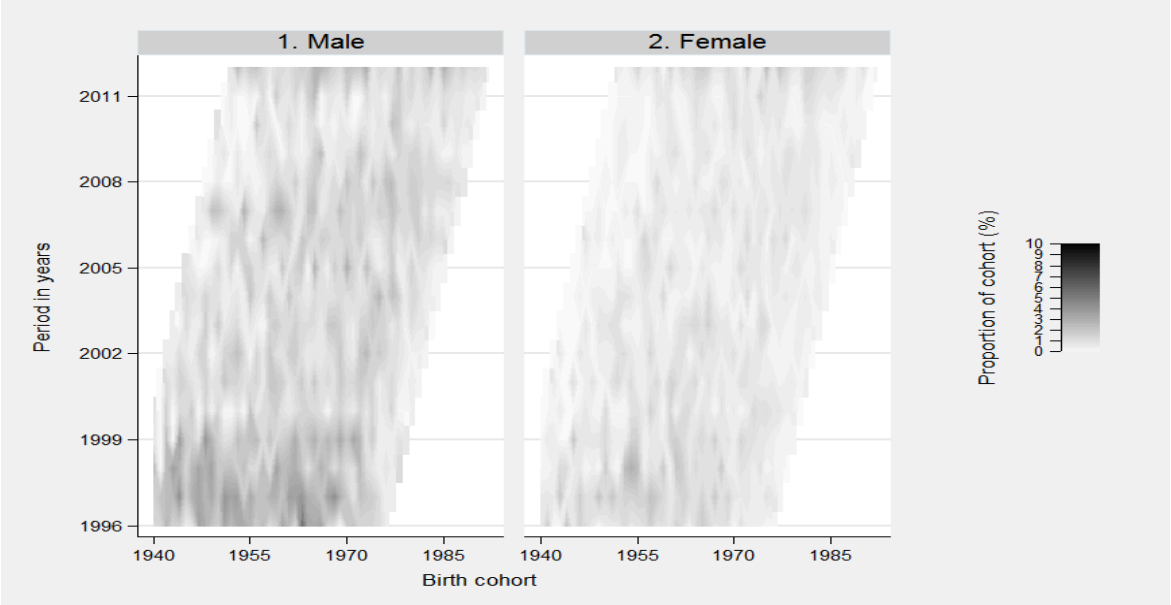


Figure 69: Africans employed in elementary occupations in the manufacturing sector, as a proportion of birth-cohort



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