Examining the level, mix and deficiencies in skills-upgrading among South African manufacturing enterprises in the late 1990s; skill-upgrading as basis for enterprise development and for addressing equity issues

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Abstract

As the South African economy get more integrated into the global economy, the competitive restructuring of local firms will be critical to their survival and future growth. Consequently, skills and technological upgrading will be crucial in upgrading the international competitive advantage of local firms. Enterprise-provided training is one means used by local firms to continuously upgrading their knowledge bases, increase their competitiveness, and enhance employment growth over time. The objective of the study is to examine the effectiveness and deficiencies of different types of skills-upgrading or training strategies used by manufacturing firms in South Africa. The effectiveness of such upgrading efforts is important at both firm- and government policy-level. One means to upgrade the absorptive capacity of the country's labour force is through enterprise training. In the context of South Africa's racially-based past, the focus and content of enterprise training has a wider social agenda. The majority of unskilled and semi-skilled workers are black. Enterprise training is expected to partly contribute to re-addressing the legacy of past Apartheid discrimination in access to skills and employment opportunities. Raising the skill-base of such labourers is expected to increase their effective participation in the labour market, reduce their venerability to losing employment, increase their relative wages over time, and help address issues of rampant poverty in the African population group. The study examines enterprise training in South African (SA) manufacturing firms, using various sources of secondary data. Despite much progress since 1994, the research questions whether trends and features of skill-development in SA's manufacturing firms are able to promote equity issues, taking into account the backlog in skill development of black South African workers. Black South African overwhelmingly occupy most of the semi- and unskilled level occupations – a legacy of South Africa's Apartheid past. They are at the bottom of the skill-ladder in most firms. Addressing 'Equity issues' will require such employees' training contribute to increasing their (future) wage earnings. This study provides no evidence that such a trend was taking place. The study is pertinent, since efficient development of competitive, dynamic and growing skills and enterprises is critical to sustainable job-creation and economic growth. With South Africa's 'broad' unemployment rate hovering close to 40%, sustainable job creation is a pre-request to poverty reduction. Tentative Public policy implications of the study findings are outlined.

Keywords: Technology, Wage premium, On-the-job training, Off-the-job training, Manufacturing, Globalisation, South Africa

1. Introduction

The paper reviews the nature of enterprise training among South African manufacturing firms, identifying any deficiencies that may exist, and how any such deficiencies may be related to wages of un/semi-skilled workers. The paper starts from an assumption that enterprise-training is critical to building-up and strengthening of the Human Capital needed by locally-based firms to compete in both local and international markets. Since 1994 when the new democratic government took over the running of the South African economy, there has been progressive opening of the domestic economy to international competition. Initial rapid integration of the economy has resulted in significant restructuring of the productive base of the economy. Past research has identified several trends that has characterised the restructuring of the productive sector, especially the manufacturing sector. For example, several studies have reported growing capital intensity in the manufacturing sector since 1994 (Edwards, 2002; Lewis, 2002; Wakeford, 2004). These studies have identified a number of complex factors that have led to such outcome. Some of the factors identified include defensive (process) innovation due to increased competition, trade liberalisation, technological change, increased labour costs due to inflexible labour laws, and reduced relative price of imported capital due to devaluation of the local currency from the middle of the 1990s. Although all these factors have played a part in contributing to increased capital intensity in varying degrees, skill-biased technological change has been found in a number of studies to be the main driver (Edwards, 2001; Bhorat & Poswel, 2003).

Increased capital intensity of the manufacturing sector has had negative impact on formal employment – especially that of semi- and unskilled workers (Bhorat, 2000). There have been significant job losses among semi- and unskilled workers. During the same period, however, the relative employment share of skilled workers has increased. Consequently, the relative wage share of unskilled workers has shrunk relative to that of skilled workers (Edwards, 2001; Bhorat, 2000). Such outcome is, however, contrary to some of the theoretical proposition on the expected benefits of globalization to integrating less developed economies[1]. Enterprise training can be seen to offer benefits not only to enterprises involved (i.e., increased productivity), but also to recipient employees in terms of wage growth – especially if such recipients are semi- and unskilled employees. Not only does such training increase the employability of such employees, it is also expected to increase their relative (future) earnings. However, past studies have found that enterprise training tends to favour more skilled employees (Budria & Pereira, 2007; Asplund, 2004). Consequently, enterprise training may actually contribute to wage inequalities among skilled and unskilled employees (Kalaitzidakis, 1997; Asplund, 2004). Such outcome if aggregated across the larger population is not likely to be socially optimal. It could led to other social ills (i.e., social discontent, strive, crime, etc). It

[1] Based on the Heckscher-Ohlin theory, globalization should lead to trade patterns that help countries to specialize in exporting products that use intensively the most abundant (& relatively cheaper) factor of production (Pretorius & Blaauw, 2005; IMF, 1997). In the case of South Africa, theoretically, globalization and trade liberalization is supposed to lead to a greater specialization in manufacturing and exporting relatively more labour-intensive products. The actual outcome has been the opposite in South Africa, opening-up the argument that other factors are at play. More on this issue later.

is, therefore, of public policy relevancy to pay close attention to the impact of enterprise training to wage earnings of various occupational groups[2].

Implementation of economic reforms in once 'closed' economies has often revealed serious deficiencies in skills required to be possessed by the local workforce, in order for local firms to be able to compete in global markets. For example, the opening-up of the Chinese economy exposed serious deficiencies in workers' skills (Ng, 2005; Ng & Li, 2003). Another study in the transition economy of Russia reveal the rapid depreciation of some skills that workers had developed under the former Soviet Union's education and training system, leading to a mismatch in the labour market (Tan, Savchenko, Gimpelson, Kapelyushnikov & Lukyanova, 2007). The consequence on the Russian labour market has been the existence of "sharp shortages of some types of skilled workers coexisting with excess supplies of others" (ibid, p3). Training of existing workforce and new entrants to the labour market had become necessary to overcome such skill shortages, as well as, help with upgrading manufacturing firms' skill-bases needed to confront the more competitive and rapidly changing globalised market. Rastogi (2000) has described today's global markets as comprising of;

> "Shifting customer preferences; changing demographics; mutation and disappearance of markets; shortening life cycle of products; emergence and growth of new service businesses; revolution in retail; emergence of new technologies; alliances and joint ventures; mergers, divestments, and acquisitions; networks and consortia of firms; globalised nature of competition; blurring of industry boundaries; expanding range and reach of multinational corporations; emergence and growth of e-commerce; pervasive over-capacity in most industries; currency fluctuations; volatile global monetary flows; and the ubiquitous challenges of complexity, uncertainty, and constant change, ... To survive and succeed, people in an organization today continually need to identify new opportunities, think and act innovatively, explore and discover new paths to growth, develop required capabilities and deploy them rapidly, face today's challenges, and prepare for an uncertain future" (p193 & 194).

Under such operating conditions, restructuring firms need to continuously upgrade their human capital if long term competitive advantage is to be sustained. Structured and purposeful effort to invest in enterprise training must, therefore, become a centre-piece of any firm's strategy in today's highly competitive environment (Schone, 2001). The process of developing appropriate 'human capital' through training to suite the specific needs of any particular firm is, however, one that is less straightforward. What type of training must be offered?, which groups of employees must receive the training?, how should it be delivered?, what are the benefits and costs?, who should pay for different types of training (i.e., employees, employer or a combination of both)?, when should training be delivered?, what its content should be?, how long the training should take?, how frequent it should be offered?, and what capabilities and competencies should be developed?, etc., are just a number of many decisions firms have to make. In the context of structural reforms and globalization, uncertainties both outside and inside the firm compound the decision making process.

Several studies have contributed to our understanding of how globalization leads to technological upgrading, and how accompanying training may lead to increased wage inequality [i.e, O'Connor & Lunati, 1999; Esquivel & Rodriquez-Lopez, 2003; Hansen &

[2] Taking into account past Apartheid governments' practice of racially-based inequalities to access of education, training, skills and employment opportunities, equities issues are an important part of the current government's public policy in South Africa.

Harrison, 1994]. A couple of studies touching on the impact of new technology on wages have also been done on South African manufacturing sector (i.e., Bhorat, 2000; Edwards, 2001; Pretorius, 2002; Tsikata, 1999; Lewis, 2002; Fryer & Vencatachellum, 2004). But, most of the studies focus on explaining generalized increase in wage inequality that has accompanied greater trade integration and technological upgrading of the South African economy. No study (to our knowledge) has explicitly examined the 'statistical' relationships between the various forms/types of training offered to workers on one hand, and wage premium on the other. This study aims to fill that gap, with a focus on different types of enterprise-training given to upgrade the skills of workers with different characteristics (i.e., education levels, occupational hierarchy, experience, gender, etc.). Xu (2005) observes the existences of very few empirical studies that examined the "various natures of training" (p1371). For example, do both 'on-the-job' and 'off-the-job' training offered to different occupational categories of employees have the same effect on productivity, wage growth or firm performance? Answers to such questions are important at the firm-level, as different modes/types of training are likely to offer different cost-benefit combinations to both the training firm and individual workers. It is also important from public policy point of view. If government policy aims to allocate public resources to foster skill upgrading of semi- and unskilled employees, it would be necessary to have a more fine-tuned understanding of whether such occupational group(s) of employees are benefiting at all from such intervention. Various training schemes used by different employees and firms, in different locations and sectors, are likely to lead to heterogeneous 'returns' to training investments (Regner, 2002; Budria & Pereira, 2007). It has been observed that "equal investments in education (*or training)* can lead to different quantities of skills or to skills that differ in their market value" (Lex, Green, Mayhew, 2001,p375). Not all types of training (or skills acquired through training) provide equal value to the employer, employee or larger society (Kuckulenz & Zwick, 2003; Budria & Pereira, 2007; Bartel, 2000).

This study does not aim to survey all the various learning or training processes used by firms, and how they are related to wage premium in South African manufacturing sector. The objective of the paper is more limited. To be more specific, the main research question addressed in this paper is; Which disaggregated learning variables (i.e., on-the-job or off-the-job training) offered to different occupational groups is significantly associated with wage premium? This study distinctly focuses on enterprise-sponsored training[3], as one of the variable picking skill-upgrading in large manufacturing firms within the Greater Johannesburg Metropolitan Area, Gauteng Province, South Africa. Where available, other important sources of learning, knowledge accumulation, and control variables are also included in the analysis.

The paper's contribution is largely empirical, and does not aim to primarily develop theory. Section two briefly outlines the theoretical framework underpinning the paper. Section three briefly gives a sketchy state of education and enterprise training in the Apartheid era and immediate post-apartheid period. Section four focuses on empirical methodology and data analysis. Section five gives a brief conclusion and possible policy implications of the results.

2. Theoretical Framework

[3] In this paper, enterprise-sponsored training captures only 'formal' training given to employees which is paid by the employer. Informal training that might indirectly be paid by the employer is not covered in this paper.

The Human Capital theoretical framework underpins this study. One aspect of the Human Capital Theory (HCT) is the emphasis on the importance of continuous learning and knowledge upgrading, whether at the level of individual employees, firm-level, sectoral-level or national level (Blundell, Dearden, Meghir & Sianesi, 1999). Early formulation of the Human Capital Theory has been ascribed to the early work of Becker (1962), acting as a catalyst for much of the research that followed on the topic (Xu, 2005; Ballot, Fakhfakh & Taymaz, 2006). One of the main theoretical arguments is that firms do invest in education and training of their employees in expectation of improved (future) productivity (Leuven, 2005). Because of accelerating market and technological change in recent years, firms also invest in training as a means to continuously upgrade the human capital[4] needed to cope with such rapid changes (Xiao, 2002). Employment-based training serves several objectives. Ng & Li (2003) outline the following benefits accruing from employer-provided training; (i) improved efficiency/productivity of workers, (ii) expansion of workers' human capital (or skill range), (iii) strengthens the capabilities of workers to cope with new technological innovation, (iv) develops workers' ability to adapt to sudden production changes, and (iv) help improve workers' morale – partly due to increased earnings that accompany receipt of training. Employer-provided training may also be used to remedy any mismatch that may exist between "skills demanded" for particular jobs, and those available in the labour market [i.e., deficiencies in skills possessed by school leavers, college graduates, etc.] (Lex *et al*, 2001).

Enterprise-training can be provided either as; (i) formal on-the-job training, (ii) formal off-the-job training, and (iii) as informal training (Ng, 2005; Xu, 2005). Becker (1962) was one of the first researchers to disaggregate training into two types; (i) general (off-the-job) training[5], and (ii) specific (on-the-job) training. Training is 'specific' if it increases productivity only in the firm that is providing the training (Becker, 1962; Barrett & O'Connell, 2001). On the other hand, training is 'general' if it is transferable and can equally increase productivity in other firms (ibid). Becker's initial argument was that firms were more likely to invest in 'specific' training, since investing firms expected to re-coupe training costs through (future) higher productivity of workers. Theoretically, private firms were expected to shy away from providing 'general' training, as it enhanced the market value of employees' skills. Increased market-value of employee skills would result in the free-rider 'poaching' externality (Leuven, 2005). In the world of competitive labour markets, only individual workers could be expected to invest in 'general' training (Ng, 2005; Leuven, 2005; Becker, 1962). Firms do not have the incentive to invest in 'general' training as all the benefits are expected to accrue to the worker (Becker, 1962; Leuven, 2005). If already in employment, individual workers may be willing to pay for 'general' training through reduced wage earnings during the training period (Leuven, 2005). However, underinvestment in 'general' training is expected to occur if individual workers face serious credit constraints (ibid).

Later studies have shown that employers actually often pay for all or share the cost of general or off-the-job training with employees (i.e., Loewenstein & Spletzer, 1999; Acemoglu & Pischke, 1999; Regner, 2002; Barrett & O'Connell, 2001). Several factors have been advanced why employers are willing to pay for general training [i.e., information asymmetry,

[4] Human capital is defined as the total accumulated stock of knowledge, skill, experience and competencies of the workforce (Barrett & O'Connell (2001).

[5] In this paper, on-the-job training and specific training are interchangeable. Similarly, off-the-job training and general training are taken to be the same. Ng (2005) and Xu (2005) uses the same assumptions.

institutions, search friction, etc.] (Leuven, 2005). For example, information asymmetry may prevent alternative employers from knowing the exact 'productivity-enhancing' value of training offered, and abilities of employees in the training firm. This information asymmetry effectively turns 'general' training into 'specific' training, thereby resulting in some returns to such training accruing to the employer (Loewenstein & Spletzer, 1999). Firms may offer general training to avoid inefficient job turnover, increase adaptability of employees, and reduce supervision costs (Xu, 2005; Leuven, 2005). In addition, most training offered by firms have varying degrees of elements of both 'firm-specific' and 'general' knowledge. Moreover, there is often some degree of complementarities between the two skill-types (i.e., between 'general' and 'firm-specific' skills.

A number of studies have found that most training investments made by firms are more biased towards employees with higher education (i.e., Veum, 1995; Whitfield, 2000; Leuven, 2001; Xu, 2005). Training investment is more efficient when offered to highly skilled workers, in the sense that it is less costly to train them, as they are 'better' learners (Barrett & O'Connell, 2001; Xiao, 2002). Rapid changes in the workplace tend to cause a rapid depreciation of 'current skills' possessed by employees, so that the 'ability to learn quickly' becomes the more valued skill than what is known by employees at any given time. Since highly educated employees have a comparative advantage at 'learning quickly', training expenditures tend to disproportionally favour such employees (Kalaitzidakis, 1997). The (negative) flip side of such a situation is that unskilled or lowerly skilled employees can be 'locked-up' in low-skill unproductive employment (Xu, 2005).

Despite the foresaid, some studies have also found that enterprise training might favour lowerly skilled employees under certain circumstances. Where training is of the 'remedial' nature, firms are likely to focus on upgrading the skills of unskilled or lowerly skilled workers (Bartel & Sicherman, 1998; Bartel, 2000; Groot, 1995). Even here, however, training is still likely to be offered to the most 'able' of the unskilled labour, making management discretion an input to who actually receive the training (Groot, 1995; Xu, 2005; Ng, 2005). In the context of structural reforms or restructuring of enterprises, training will most likely be offered to those unskilled employees who have survived the retrenchments. Training investments may still be 'selective' in the sense that it is offered to employees who, on average, have greater abilities than those who have been retrenched. Unskilled workers are also more likely to benefit from training investment depending on whether their work is in close proximity to skilled workers' (Tan & Lopez-Acevedo, 2003). Many production processes often have subsystems that have both high-tech sophisticated components (managed by skilled workers) and low-tech components (managed by semi/unskilled workers). Ensuring the efficiency and reliability of the whole production system requires not only the upgrading of the skill-base of skilled workers, but also that of lowerly skilled workers manning the low-tech components (ibid). In addition, introduction of what are called 'high-performance work practices' has increased the work demands placed on shopfloor workers. Introduction of cross-functional work-teams, multi-skilling, quality circles, flexibility, employee-involvement, and continuous improvement schemes normally can only succeed if shopfloor workers are equipped with relevant analytical and technical competences needed to take additional responsibilities and autonomous decision-making that comes with these practices (Barton & Delbridge, 2004). Consequently, introduction of 'high-performance work practices' is likely to also favour the up-skilling of shopfloor workers (Ng & Li, 2003; Whitfield, 2000). To the extent that training distribution

favours un- and semi-skilled employees, it can contribute to raising the productivity of such workers and lead to a more equitable wage distribution[6].

Beyond the above (broad) generalizations, there is lack of agreement on which type of training offers the most 'returns' to different groups of employees (Kuckulenz & Zwick, 2003; Budria & Pereira, 2007). Consensus still does not exist on the relative effectiveness/efficiency of various types of training (i.e., informal training, formal 'on-the-job' training, formal 'off-the-job' training, etc) in increasing wage growth of different employee groups (Asplund, 2004; Regner, 2002). In fact, it is only relatively recent that studies are beginning to address the impact of different participation rates of various worker-groups in training, and the subsequent differential returns on wages[7]. Put differently, different groups of employees have different participation rates in different training schemes, which themselves (i.e., training schemes) may have different 'returns'. A number of factors do impact on the firms' decision to invest in training of various occupational categories of employees. The nature of the relationship(s) between training investments, type of group(s) of workers who are chosen for particular type(s) of training, and wage inequalities is/are often an empirical question and context-dependent (Carayannis & Alexander, 2002).

3. Skill Development in the South African Economy and its Manufacturing Sector

In this section, we restrict ourselves only to salient trends – especially as they relate to the manufacturing sector, its technological-upgrading, and training. When the ANC-led government of National-Unity came to power in 1994, it inherited a declining economy (Lewis, 2002). The government also inherited a racially framed education and training system that had systematically excluded or limited access to quality education for the majority of the black population (Badroodien, 2005). The Apartheid educational and skills development system left a legacy of structural inequalities that favoured whites in terms of access to high quality education, work skills, managerial, professional and technical occupations (Horwitz *et al*., 2002). At the aggregate level, the consequence was a truncated racially segmented labour market, with the majority of black Africans not being able to acquire the human capital that would enable them to meaningfully pursue productive employment opportunities (Lewis, 2002). The consequences of Apartheid policies can be seen in the racial composition of various occupations in one of the survey conducted on manufacturing firms. A descriptive analysis of the World Bank sponsored survey on large-medium sized manufacturing firms in South Africa's Gauteng province reveals the representations of all racial groups across the various occupations (see Table 1).

[6] The assumption is that higher productivity is more likely to lead to higher wages. One caveat must be mentioned here, however. In transition economies where the output of the education system is poor, enterprise training might focus on bringing the skill-base of new labour market entrants to the bare minimum level needed to handle the technology used by the firms, instead of focusing on improving the productivity of such employees. Studies on some Chinese firms have supported such assertions (Ng, 2005) . In such cases, such training might or might not raise subsequent wages of employees.

[7] Kuckulenz & Zwick (2003) and Budria & Pereira (2007) are two recent studies that have attempted to simultaneously address heterogeneity of training types, training participants, and differential returns.

Table 1: Share of Employment in Individual Occupations, by Race and Gender

Race	Africans		Coloured		Asian		White		Total
Occupation	Male	Female	Male	Female	Male	Female	Male	Female	
Managers	10.13	1.33	3.79	1.04	4.43	0.78	66.68	11.84	100
Professions & Technicians	16.31	2.35	4.57	1.01	5.55	0.98	55.84	13.38	100
Clerks	19.16	7.30	3.62	3.92	5.94	3.20	17.81	39.06	100
Sales & services	25.59	3.68	3.38	1.89	3.24	1.11	39.74	21.37	100
Crafts	35.26	6.32	12.24	2.55	3.14	0.22	38.83	1.44	100
Operators	70.16	11.33	6.34	3.52	2.28	0.19	5.28	0.90	100
Labourers	74.49	18.34	2.18	1.90	1.27	0.22	1.33	0.27	100

Source: Bhorat & Lundall (2004, p1029)

Table 1 show that almost 79% of management positions in the surveyed firms were occupied by white males and females. Only about 11% of management positions were occupied by Africans (Bhorat & Lundall, 2004). In fact, relative to all the other races, white males and females dominated in all the top occupations [i.e., Managers, Professions & Technicians, Clerks, Sales & services] (ibid). Africans were overwhelming represented at the bottom-end of the occupational/skill hierarchy. They occupied over 81% of all positions at 'Operators' level and almost 93% of all positions at the 'Labourers' level. For Whites, the figures were 6.18% (Operators) and 1.6% (labourers), respectively. In South Africa, wages from formal employment form a very large component of household incomes (Bhorat, 2004). The figures shown in Table 1 do not only capture inequalities in terms of access to high quality jobs among the various racial groups, it also gives an indirect explanation of why poverty levels are more entrenched within the African population (ibid).

The higher educational system operated by Apartheid-era governments had a number of weaknesses. Of the several weaknesses identified in past literature, two are of particular interest to this study. The National Council for Higher Education's (NCHE) study found that; (i) the output from the South African Higher Education system had a chronic skill-mismatch with the labour market requirements of a modern economy, and (ii) the system was fragmented, supply-driven, not sufficiently responsive to current national needs (NCHE, 1996). While some progress in restructuring the educational system has been made since 1994, one later study still found deficiencies in the competencies of learners on some core subjects – maths and science - seen to be critical to the ability of the economy to innovate and compete in high-value added, hi-tech fields in today's global markets. The Third International Mathematics and Science Study (TIMSS) conducted by the International Association for the Evaluation of Educational Achievement (IEA) in 1999 revealed startling finding with regard to the poor quality of Science and Mathematics skills among South African learners. South African learners scored the lowest in Mathematics and Science skills, out of the 38 countries covered in the study (DTI, 2006).

With regard to enterprise training, training budgets were on the decline in the pre-1994 period (Kraak *et al*. 2000; Badroodien, 2003;2005). Part of the decline was a consequence of the economic decline, compounded by tightening international sanctions against the apartheid government and political turmoil. In such a volatile economic environment, most firms did not have the incentive to invest in the training of their workforce. Several deficiencies of the enterprise training regime in place pre-1994 have also been identified in a few studies. For a

start, enterprise training was relatively low, with an inadequate coverage of the workforce, and employers facing very little pressure to train (Haasbroek, 2002). Employers lacked commitment to training and were often not fully aware of the full range of benefits that could be derived from training (NTB/HSRC, 1991; Kraak *et al*., 2000). Most of the enterprise training that was then offered comprised mainly of in-house short courses, which were mainly firm-specific – especially for lower and unskilled workers (Badroodien, 2005). Such type of training could not offer such employees with skills that would be portable enough for them to have some bargain power in the labour market.

A later enterprise survey did show some improvements, but troublesome trends still persisted. The HSRC enterprise survey done in 2000 found that almost two thirds of in-house courses offered were of less than five days duration, and often focusing on immediate skill needs of workers in their specific jobs (Badroodien, 2005). At the level of individual workers, such 'employer-specific' training has poor returns when compared to skill-upgrading associated with portable qualification-based 'long courses' (ibid). Equally importantly, enterprise training in high-skills occupations was still not yet de-racialized nor gender neutral. As shown in Table 2, about 71% of employees trained in professional and managerial occupations were still white male, compared to only 16% Africans in those occupations. With respect to gender, about 72% of employees receiving enterprise training in the "Professional and Managerial' occupations were male, compared to only 28% of females in the same occupational category. The ratio of female employees being offered training drops even further at the 'Technicians' level. The overall training rates were still very low for most occupations examined in Table 2. With the exception of the Clerical/Administrative occupational group[8], the training rates for the other occupational groups were 15% or less (see Column 2).

Table 2: Enterprise training by occupation, race and gender, 2000

Occupations	**Percentage people trained**	**Gender**		**Race**			
		Male %	**Female %**	**African %**	**Coloured %**	**Indian %**	**White %**
Professional & Managerial	10.9	71.9	28.1	16.4	4.9	7.4	71.3
Technicians	11.1	82.9	17.1	27.8	8.6	8.6	55.1
Clerical/administrative	23.2	41.2	57.9	30.9	15.8	15.3	37.9
Service & sales workers	14.4	67.0	33.0	44.3	17.3	16.2	22.2
Craft and related workers	11.4	93.5	6.5	49.0	8.8	2.6	39.6
Plant and machine operators, & assemblers	14.1	77.9	22.1	83.6	9.3	2.3	4.9
Unskilled labourers	14.9	79.1	20.9	89.4	9.6	0.6	0.4
Overall percentage	**100**	**69.9**	**30.1**	**47.5**	**11.5**	**8.6**	**32.4**

Source: Kraak *et al*. (2000, p42-46)

When one considers the extent to which training is offered to employees across various sectors of the economy, one can still see that the manufacturing sector as a whole performs badly relatively to sector such as Banking, Energy, Financial & Accounting services, Insurance,

[8] The higher training rates for this occupational group might be due to relatively higher introduction of Information and Computer Technology (ICT) associated with their work.

wholesale and retail (Table 3). The manufacturing sector[9] as a whole offered training rates ranging between 14.8 – 41.7% of the total number of workers employed in each of the subsector. The sector as a whole, therefore, offered relatively low training levels across the various subsectors. As indicated earlier, enterprise training had been declining since the late 1980s, with the decline seen to have accelerated during the 1990s (Badroodien, 2005).

Table 3: Percentage levels of training by sector

Economic sector/SETA	**Training rate (%)**
Banking	64.2
Chemical industries	31.9
Clothing, textiles, footwear and leather	41.7
Construction	22.3
Energy	57.2
Financial and accounting services	56.6
Food and beverages	34.1
Forest industries	24.9
Information systems (IT), electronics and telecommunication technologies	35.8
Insurance	80.0
Manufacturing, engineering	34.4
Media, advertising, publishing, printing and packaging	30.5
Mining	39.8
Primary agriculture	16.2
Secondary agriculture	14.8
Services	38.3
Tourism and hospitality	40.6
Transport	33.7
Wholesale and retail	57.0
Total	**44.9**

Key:
Training rate = Number of employees training as a percentage of total employment in each sector

Source: Badroodien (2003)

In the absence of training data specific to the manufacturing sector, Table 4 shows an indication of the overall training trend that took place within the 1986-98 period. The table shows how Apprentice training - which have proved important in strengthening the international competitiveness of some European economies like that of Germany - had a total decline in enrolment of 44% between 1986-98 (Kraak, 2005). Enrolments at Private training centres saw some of the dramatic declines, with a drop of almost 81% between 1986-98. Even training schemes driven by industry-based levy system were not immuned from a decline in enrolments, showing a drop of over 82% between 1986-98. Such massive drop of interest in

[9] The total manufacturing sector includes the following subsectors given in the table: Chemical industries; Clothing, textiles, footwear and leather; Food and beverages; manufacturing, engineering; and secondary agriculture.

enterprise training partly explains some of the motivation behind a series of training-related institutional reforms the ANC-led government introduced towards the end of the 1990s[10].

Table 4: Enterprise Training (1986-98)

Type of training	1986	1988	1990	1992	1994	1996	1998	Rate of change by training type, 1986-1998 (%)
Artisan training								
Apprentices	29826	23416	24448	25785	22015	18546	16577	-44.4
In-service training								
Regional training centres	12599	39661	31650	23560	19227	26157	9524	-24.4
Private training centres	259315	259805	251094	211829	-	44746	50354	-80.6
Training schemes where levies apply	7149	13680	19686	34608	28209	37753	1267	-82.2
Training schemes (Section 48 of LRA)	9570	4879	17640	13667	10568	1622	-	-83.0

Source: Kraak *et al*. (2000)

Table 5 shows estimate from various studies of the type of training offered among firms. The data as shown, however, gives only a crude view of the type of enterprise training offered in South Africa. There is, however, some sort of pattern in the limited information shown in Table 5. The table confirms the fact that most type of training offered by firms tended to be overwhelming 'in-house' training. This type of training is likely to be more firm-specific and of a shorter duration (Paterson & du Toit, 2005). Moreover, some of the (formal) in-house training offered is likely to focus on 'soft' issues [i.e., training on health and Safety, Industrial relations, team working, don't seal from the company, etc.] rather than the 'hard' technical type (Badroodien, 2005). The amount of external training offered by firms ranged between 22 – 32% from the three studies that provided such information. As noted by Bhorat & Lundall (2004), external training may be proving more expensive than in-house training for some respective firms. An alternative explanation based on 'Human Capital theory' might focus on the type of knowledge acquired when employees attend external training. Such training is likely to be of the 'general' type, which may be more transferable across firms (Leuven, 2005). Consequently, firms may not readily be inclined to invest widely in such training, with the exception of acquiring critical knowledge that may be lacking in-house or for specific 'critical' staff. From the data available, it was not possible to test the validity of the later explanation. However, Lewis (2002) finds no compelling support that firms avoid investing in training

[10] Towards the end of the 1990s, the government took a number of measures to try to address the skill shortages and declining training in enterprises. In 1998, the government enacted the Skills Development Act. In 1999, the government again enacted the Skills Development Levies Act, which partly aimed at developing measures needed to generate funding for enterprise training. Because of the usual lagging effect of such policy measures, the benefits derived from such policies lie beyond the time period being covered in this study (i.e., the late 1990s).

because of the fear of losing trained staff. His research finds that only 5% of trained staff left their employer after they had received firm-sponsored training.

Table 5: Percentage in-house vs external training (2000-2002)

Training type↓ \ Study →	Human Sciences Research Council 2000 (%)	World Bank Report 1 2000 (%)	World Bank Report 2 2000 (%)	P-E Corporate Services 2001 (%)	Bureau for Market Research 2002 (%)
In-house training	63	35	72	68	10
External training	na	24	22	32	na

na = not available

Source: Badroodien (2003)

To summarize this section, the manufacturing sector has become increasing more capital and skill intensive since 1994 when the ANC-led democratic government took over the running of the country. A number of factors have been cited as contributing to such a trend. Skill-biased technological change, globalization, trade liberalization and import competition, have all in varying combinations contributed to changing the structure of labour market. Demand for skilled labour has expanded relative to unskilled and semi-skilled labour. The change in labour demand is depicted more vividly when one examines the nature and change in factor intensity of manufactured exports from South Africa. When compared with other countries at the same level of economic development, South Africa seem to have a relatively lower share of manufactured exports that intensively use unskilled labour (Lewis, 2002). Over time, the share of manufactured exports that intensively use skilled labour has expanded (Table 6). The consequence is that expanding manufactured exports have created few and fewer jobs. At the same time, increasing skill-intensity in the sector has led to more and more retrenchment of semi/unskilled labour, increasing their venerability in the labour market. To the extent that employment-based training can help in upgrading the human capital of unskilled labour, enterprise-training can act as a lever in reducing wage inequalities between workers of different occupational groups. It is, therefore, important to investigate to what extent different forms of enterprise-training offered to different employees contribute to 'equity' objectives within South African manufacturing firms.

Table 6: Structure of Manufacturing Exports by Factor Intensity (% of total exports)

	South Africa 1992	South Africa 1999	China 1995	Indonesia 1994	South Korea 1995
Natural resource intensive	24.0	19.6	25.2	71.0	8.6
Unskilled labour intensive	8.9	6.8	40.5	20.5	36.0
Technology intensive	17.5	15.1	13.1	3.5	26.9
Human capital intensive	49.5	58.5	19.3	4.5	26.5
Total exports	100.0	100.0	100.0	100.0	100.0

Source: Lewis (2002)

A search of past research on South African manufacturing firms has not revealed any study that has 'statistically' linked different forms/types of training to wage premium. Hence, the impetus for the empirical section that follows below.

4. Empirical Methodology and Data Analysis

The data used in this study comes from the joint World Bank/Greater Johannesburg Metropolitan Council co-ordinated survey of large manufacturing firms[11], within the Greater Johannesburg Metropolitan Council (GJMC) area. The 'cleaned-up' survey data comprised of 325 firms covering 8 manufacturing subsectors. The subsectors represented in the survey dataset were: Food & Beverages; Textiles; Metal products; Iron & Steel; Electrical/electronic machinery; Paper & furniture; Vehicles & automotive components; and Chemicals. Stratified sampling across the 8 subsectors, followed by random sampling within each subsector was used to select firms that were later interviewed[12]. The survey was conducted during the 1999-2000 period, collecting firm-level information mainly for 1997-8 financial years (Chandra *et al*., 2001). To date, it is the most detailed and extensive firm-level survey available in South Africa. The GJMC area, within which the survey was conducted, accounts for 40% of South Africa's large manufacturing firms, and about 42% of the country's formal manufacturing employment (Chandra *et al*., 2001; Suleman & Naude, 2003). While the survey is not national in nature, the area covered by the survey represents a large enough segment of the manufacturing sector to significantly inform public policy debate and other stakeholders (Edwards, 2002). Though the survey provides worthy of information at the firm-level, it was not tailored specifically to address technology, skill development and wage inequality issues. Consequently, analysis of some variables of interest in this study required the use of proxies available in the survey dataset. For our research purposes, there are two important 'human capital' variables that are conspicuously missing; (i) the average 'education levels or years of schooling' and, (ii) the average 'length/tenure of employment or work experience' of different occupational categories of employees in target firms. These limitations have to be borne in mind when interpreting the results of the analyses made below.

The selection of variables was dictated by the presence or absence of appropriate indicators in the survey dataset that was used. The nature of analysis undertaken is thus circumscribed by the design of the questionnaire that was used to conduct the survey. The 'Dependent variable' is wage inequalities is Wage Premium. Simple Ordinary Least Square (OLS) regressions are used in the statistical analysis of survey data. OLS regressions are used primarily because of their relative simplicity. The general format of OLS regressions used took the format of;

$$CP_i = a + b_iX_i + b_jCV_j + e$$

Where;

[11] A large firm is defined as a firm with at least 50 full-time employees. However, from the sample of firms that answered the questionnaire, there are a few firms whose employee size just fell below 50.

[12] For more details on the sampling procedure used, see Chandra *et al*. (2001).

CP_i = Wage Premium variable
a = a regression constant
b_i, b_j = regression coefficients
X_i = vector of firm-level learning/knowledge accumulation mechanisms
CV_j = vector of various control variables (i.e., capital-intensity, sub-sector dummy, firm-size, exporting activities, ownership type, etc.)
e = Error term

Wage Premium vs. Skill upgrading

The set of regressions done for analysis are shown in Table 7. The dependent variable is Wage premium (LWagePremium), calculated as a ratio of wages earned by skilled workers to wages earned by unskilled workers. A similar definition of 'Wage Premium' was also used in other studies (i.e., Greiner, Rubart & Semmler, 2004). The main objective of regressions done in Table 7 was to examine whether observed increase in wage premium in post-reform period (i.e., after 1994) was associated with training of offered to different occupational groups. Particular attention is focused on training effect on wages of semi- and unskilled workers. If training offered to these occupational groups is contributing to equity objectives, we would expect that training offered to semi- or unskilled workers would have a negative significant relationship with wage premium variable. Other variables like investment in new capital, foreign ownership, and exporting status were included in regressions as control variables. The result in Regression 1 suggests that expenditure on in-house training is significant and positively related with increased wage premium. The results indirectly suggest the possibilities that training expenditure may have a greater (or disproportionately greater) impact on wages of employees in higher occupational groups relative to lower ones. The finding is not necessarily unique to South African manufacturing. In the context of increased capital intensity combined by shortages of highly skilled workers, there is a high possibility of a skill-premium. Severe skills shortages have been acknowledged in a number of studies on South African labour market (i.e., Lewis, 2002; Horwitz, 2002; Wakeford, 2004; Bhorat & Lundall, 2004). In addition, if most training resources are spent largely on those already 'skilled' at the expense of training the unskilled or semi-skilled workers, such skewed training expenditures are likely to increase wage premium in the long-run[13]. Other studies have noted an improvement in income of skilled labour in the post-reform/1994 era, accompanied by a decline or levelling-off of income accruing to (unskilled) labour (Bhorat, 2000; Edwards, 2001;2002). Further research needs to be undertaken to establish which categories of employees use most of the training budgets among firms. It is also important to determine the 'content and quality' of training that is given to various occupational groups – especially for those at the lower end of the skill ladder.

Increasing the proportion of management and clerical staff who are sent on off-site training programs seems to be related to an increased wage premium. The results, in general, suggest some support for one of the tenants of Human Capital theory. Off-the job training is seen to have a greater impact on wages as it is often more 'general' and potentially transferable across various employers (Leuven, 2005). However, such argument does not explain why off-the-job

[13] This argument assumes wage premiums are a function of skills obtained through such employment-based training efforts. Wage earnings in South Africa seem to be partially determined by other factors [i.e., race, white colour unions, qualification at the time of entry, etc.] (Bhorat, 2000; Fryer & Vencatachellum, 2004).

training offered to professional/technical staff does not have the same effect. More detailed study that examines the quality and content of training given to different occupations would provide more detailed understanding of why different forms of training affect wage growth differently.

There is anecdotal evidence that those employees at the bottom of the skill-ladder may still be losing out on firm-level training (see Table 2). For example, even where licensing agreements provided opportunities for transfer of technology through training of employees, such opportunities where often not utilised by licensor firms (Nordas, 1996).

The lack of a significant positive association between wage premium and foreign ownership variable in Regression 1 is surprising (as is also the case in the other two regressions that are specified slightly different). Some studies elsewhere have suggested a positive association between the two variables (i.e., wage premiums are higher in foreign owned firms). For example, a study on Mexico found that one factor contributing to the increased wage inequality was the nature of labour demand that was skewed towards skilled labour among incoming foreign firms (Feenstra & Hanson, 1997). In addition, the impact of foreign ownership on wage premium is compounded if such firms are export-oriented. Foreign firms seem to pay relatively higher wages for skilled workers, particularly if their investment is located in high export-oriented industries (Hanson & Harrison, 1999). Surprising, our regression results do not seem to detect such a trend in our sample. The above finding may, however, be due to the fact that most MNCs operating in South Africa were targeting mainly the local market (at the time of the survey) rather than the export market[14].

Regression 2 is exactly the same as Regression 1, with one exception. The percentage of output exported (LExportPtge97_8) is replaced by an export dummy (ExportDumy). The main reason why the variable 'LExportPtge97_8' was replaced, was the need to see whether wage premium was affected by export status of firms (i.e., whether a firm is an exporter or not?), rather than the degree of output exported. The results in Regression 2, however, do not significantly change from those in Regression 1 - even though the 'TrainClcPgeO' is no longer significant. Regression 3 has both variables 'LExportPtge97_8' and 'ExportDumy' entered in the regression. The entering of both variables was meant to measure two different things. 'Exporter' dummy is meant to capture whether being an exporter or not has a different impact on wage premium. 'LExportPge97_8' is meant to capture the impact of greater export orientation on wage premium. The inclusion of both variables did not cause the Heteroskedasticity test to reject the null hypothesis. The introduction of both variables changes the significance of a few variables. Average sales (LAvgeSales97_8) is seen to be positively related to wage premium (i.e., large sales are more likely to facilitate or make large wage premiums affordable). The percentage of output exported (LExportPtge97_8) is sensitive to specifications. It now has a negative and moderately significant coefficient in Regression 3 - even though it was not so in Regression 1[15]. The coefficient for LExportPtge97_8 is only significant at 10% significance level. The result suggests that higher wage premiums were

[14] I am grateful to Professor Philip Hirschsohn at University of the Western Cape, for making this point. A study in India shows that there are differences in operational characteristics between market-seeking MNCs and efficient-seeking MNCs.

[15] The coefficient for LExportPtge97_8 is only significant at 10% significance level.

Table 7: Regression equations with Dependent Variable – LWagePremium

	Regression 1	Regression 2	Regression 3
Constant	0.03549	-0.6848	-0.7890
LNewInvest97_8	0.1718	0.1521	0.1619
LCapital/Employee	-0.0807	-0.0648	-0.1448
LAvgeSales97_8	0.1777	0.2012	0.2281^{+}
ForgnOwnShp	0.1948	0.1789	0.1489
Sectdum1	0.2319	0.2708	0.3638
Sectdum2	0.0824	0.0995	0.3797
Sectdum3	0.3966	0.4322	0.5284
Sectdum4	0.1709	0.1574	0.5634
Sectdum5	-0.0505	0.0934	0.2926
Sectdum6	-0.4202	-0.2919	-0.2354
Sectdum8	-0.2150	-0.1495	0.0127
LInhseSpTrng	0.2537**	0.2545**	0.2349**
LOstSpTrng	0.0428	0.0705	0.0332
LExportPtge97_8	-0.1259		-0.2507^{+}
TrainMgtPgeI	-4.7106	-5.2368	-5.7693^{+}
TrainPflPgeI	0.7279	0.2945	0.7203
TrainClcPgeI	-0.3981	-2.0750	-3.4263
TrainCrftPgeI	-0.7489	-0.6911	-0.8472
TrainUnSkdPgeI	0.3289	0.3675	0.6383
TrainComPgeI	-0.4387	-0.5731	-0.5391
TrainMgtPgeO	7.7839^{+}	8.9143*	10.0275*
TrainPflPgeO	-2.2512	-2.8772	-2.3489
TrainClcPgeO	9.4194*	6.8779	7.9479^{+}
TrainCrftPgeO	-1.7007	-1.7736	-1.6593
TrainUnSkdPgeO	-1.1825	-0.5744	-0.4995
TrainComPgeO	0.3203	0.8823	0.5812
TradeAssociation	-0.3807	-0.3523	-0.3860
Subcontract	-0.2244	-0.1257	-0.1626
RawMImptdPge	-0.0016	-0.0021	-0.0007
FirmSize	0.0002	0.0003	0.0003
Age	-0.0121	-0.0083	-0.0102
LAge^2	0.0777	0.0276	0.0716
LearningByDoing	0.0131	0.0119	0.0127
ExportDumy		-0.0259	0.5408
Adjusted R^2	0.2161	0.1846	0.2143
F	1.99	1.81	1.98
p	0.0059	0.0155	0.0062
N	120	120	120
Ramsey reset test - F p	0.95 0.4184	1.33 0.2704	1.32 0.2736
Cook-Weisbergtest–Chi2(1) p	1.91 0.1667	0.86 0.3539	0.18 0.6712

*** = significant at 0.001, ** = significant at 0.01, * = significant at 0.05, $^{+}$ = significant at 0.1

Key of all variables used in above regressions is shown below

Source: Survey Data

Definitions for variables in Table 7	
LWagePremium*	**Wage bill paid to non-production workers ÷ Production workers' wage bill paid in 1998**
LSalespCaptl97_8	Average total sales made during 1997-8 ÷ total replacement value of machinery & equipment in 1998.
LAvgeSales97-8	Average total sales during 1997-8 period
LCapital/Employee	Total replacement value of machinery & equipment ÷ total workforce
LExportPtge97_8	Average percentage of output that was exported during 1997-8 period
ForgnOwnShp**	Ownership dummy (Foreign = 1, Domestic = 0)
Sectdum1-8	Sector dummies (Sectdum1= Chemical products, 2=Electrical/electronic machinery, 3= Food processing & beverages, 4= Iron & Steel, 5= Metal products, 6= Paper & furniture, 7= Textiles, 8=Vehicles & automotive components)
LInhseSpTrng	Amount spent on 'in-house' training ÷ total value of machinery/equipment
LOstSpTrng	Amount spent on "outside" training ÷ total value of machinery/equipment
TrainMgtPgeI	Number of Management staff on inhouse training ÷ total workforce
TrainPflPgeI	Number of Professional/technical staff on inhouse training ÷ total workforce
TrainClcPgeI	Number of Clerical/service workers on inhouse training ÷ total workforce
TrainCrftPgeI	Number of Crafts,trades,operators on inhouse training ÷ total workforce
TrainUnskldPgeI	Number of unskilled labour on inhouse training ÷ total workforce
TrainComPgeI***	Number of 'combined' categories on inhouse training ÷ total workforce
TrainMgtPgeO	Number of Management staff on 'off-the-job' training ÷ total workforce
TrainPflPgeO	Number of Professional/technical staff on 'off-the-job' training ÷ total workforce
TrainClcPgeO	Number of Clerical/service workers on 'off-the-job' training ÷ total workforce
TrainCrftPgeO	Number of Crafts,trades,operators on 'off-the-job' training ÷ total workforce
TrainUnskldPgeO	Number of Unskilled workers on 'off-the-job' training ÷ total workforce
TrainComPgeO***	Number of 'combined' categories on 'off-the-job' training ÷ total workforce
TradeAssociation	Member of a Trade Association dummy (1= member, 0= not a member)
Subcontract	Does firm subcontract production and/or marketing activities (Yes=1, No=0)
FirmSize	Total number of full-time employees in the firm
Age	When did production start at this location?
$LAge^2$	Logarithm of square of 'When did production start at this location?'
LearningByDoing	Average length of producing the three (3) most important products
AvgTwagePerEmpl	Average wage bill per employee
LNewInvest97_8	Average new investment made in machinery & equipment during 1997-8 ÷ total replacement value of machinery & equipment in 1998.
RawMImptdPge	Average percentage of total value of material inputs that was imported during 1997-8
ExportDumy	Does the firm export or not (Yes=1, No=0)

* = Dependent Variable is in bold

** = A firm is classified as 'Foreign-owned' if percentage of total assets that is foreign owned is ≥10%.

*** = "common" training programs are those training programs which are not tailored to particular employee categories. Mixture of employees from different skill categories (i.e., management, professional/technical, crafts/trades, unskilled, etc) attend such training programs.

Source: Survey Data

more likely to be related with non-exporting firms. The result was initially puzzling, as we expected higher wage premiums to be positively related to higher exports. On the other hand, the result suggests existence of relatively higher profit margins when selling in the domestic market relative to selling in international markets. For example, import-parity pricing of domestic output practised by dominant Iron & Steel producers makes it possible for them not to pass the benefits of low cost inputs in their industries to down-stream firms [i.e., those in the Metals products subsector] (Machaka & Roberts, 2003). As a result of market power, the difference between domestic costs of production and import-parity prices is 'absorbed' by Iron & Steel producers. Such higher mark-ups make it easier for firms focused on the domestic market to afford higher wage premiums relative to exporters[16]. Market power of upstream producers is a result of high industry concentration in South Africa. Over 80% of industrial output is accounted for by relatively few large conglomerates (Mani, 2001). In such a market structure, it is possible for such firms to have some degree of control on product prices. Smit (1999) found that the positive relationship between industry concentration and wages in South African manufacturing remains significantly higher (than other countries at the same level of development), even after controlling for industry and worker's characteristics.

As a confirmation of findings in Equation 1, the result in Equation 3 suggest that higher wage premiums are moderately related to declining numbers of management staff participating on 'on-the-job' training programs, but strongly related with increasing number of management staff being sent to 'off-the-job' training programs. The trend is not necessarily unique to South African firms. A study on Mexican firms also detected increased outsourcing of training following trade integration of the economy (Tan & Lopez-Acexedo, 2003). The need to focus on 'core' competencies and the growing acceptance of the importance of externally available information/knowledge in enhancing competitiveness seem to drive the trend towards more outsourcing of technical services. However, external training is likely to be skewed towards occupation groups with higher skills. Again, there is need for further research on the causes, nature, and orientation of training resources in manufacturing firms. Questions on whether skill upgrading is taking place for all employees or only for a few employees in specific occupations need to be analysed further.

5. Conclusions and Policy implications

The study focused on examining the relationship between employment-based training (as one component of skill upgrading) on one hand, and 'wage premium' on the other hand. The study reveals the need for a more sophisticated and differentiated view of how skill-upgrading is related to wage premium among manufacturing firms in South Africa. Not all skill-upgrading efforts given to different occupational groups have a 'qualitatively' the same impact on wage growth. In this limited analysis, there is no evidence that training that was being offered to unskilled and semi-skilled manufacturing workers wage significantly reducing the wage premium. It is likely that training of semi/unskilled workers was more 'remedial' rather than targeting raising productivity.

[16] For example, turnover growth was driven more by price changes among non-exporters in the automotive components manufacturing sector in KwaZulu-Natal. However, turnover growth among exporters was driven by increases in sales volume (Valodia, 1999).

The need to streamline employment-based company sponsored training expenditures maybe one obvious policy implication at the firm-level. There is a need to synchronise design of training programs to types of outcome being sort. Unskilled labour bore the brunt of job losses in the reform period. Again, raising the need to closely examine the efficacy of training expenditures that are given to different occupational categories of employees.

Only training offered to a larger proportional of management and clerical staff seem to be significantly related to observed increase in wage premium. For example, training a larger proportional of 'Professional/technical staff' does not seem to be associated with increase in wage premium. The result may (indicatively) suggest growing wage inequalities not only between skill groups, but also within skill-groups (i.e., earning differences growing among employees with similar education, occupational status, gender, race, experience, etc.). Our result here is only anecdotal. More focused studies on 'drivers' of within-group wage inequalities might prove fruitful direction for future research. Further research may also need to focus on comparing levels of "training expenditures" in South African firms with comparative firms in other countries at the same level of development (i.e., Brazil, India, Mexico, China, Indonesia, etc.). One of the main limitations of our study relates to the time period covered by the survey dataset used in the analysis. It is important to emphasis the time period this study is reviewing, 4-5 years after the new ANC-lead government came into power. Main of the national skills developmental policy changes that have since been put in place (e.g., National Qualification Framework, the Skills Development Levy, etc.), were not yet firmly in place then. Consequently, most of our research findings might relate to restructuring experiences of firms in the early years of economic reforms. Longitudinal studies might enhance our understanding of the dynamics of the various relationships analysed in this paper, over time. Moreover, our analysis in the main, has not taken into account the impact of informal training or other informal knowledge sources on the dependent variable. Despite these limitations, however, our study results provides a base from which more comprehensive and tailored future firm-level surveys can be benchmarked against.

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