Employment Outcomes and Export-Orientation in Kenya: Evidence from the Manufacturing Sector.*

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Abstract

The paper investigates the impact of trade, i.e. export orientation on employment outcomes in Kenya's manufacturing sector using firm-level data collected under the auspices of the World Bank's project on regional enterprise development during the period of trade liberalisation. The analysis shows that 36% of all the workers in the manufacturing firms were casual or part time workers in 2003. Export-oriented firms generally employed more workers on average, relative to non-exporting firms but the gap has narrowed— the share of employees in exporting firms in total employment declined by over 20 percent between the early 1990s and 2003. Although 36 percent of employees in manufacturing were casual or part-time workers by the latter date, the results show that "exporting" did not significantly influence the proportion of casual workers employed by the firms, although, by virtue of their size, export-oriented firms employed more casual and part time workers than non-exporting ones. There was also a shift of firm employment toward a more skilled labour force during the period of trade liberalization. The combination of an increasingly skilled labour force in Kenya and deepening causalisation among workers, points to a conundrum that requires further analysis. That notwithstanding, the quality of jobs created should be a policy priority. There is need to strengthen and strictly enforce labour regulations governing casual forms of employment.

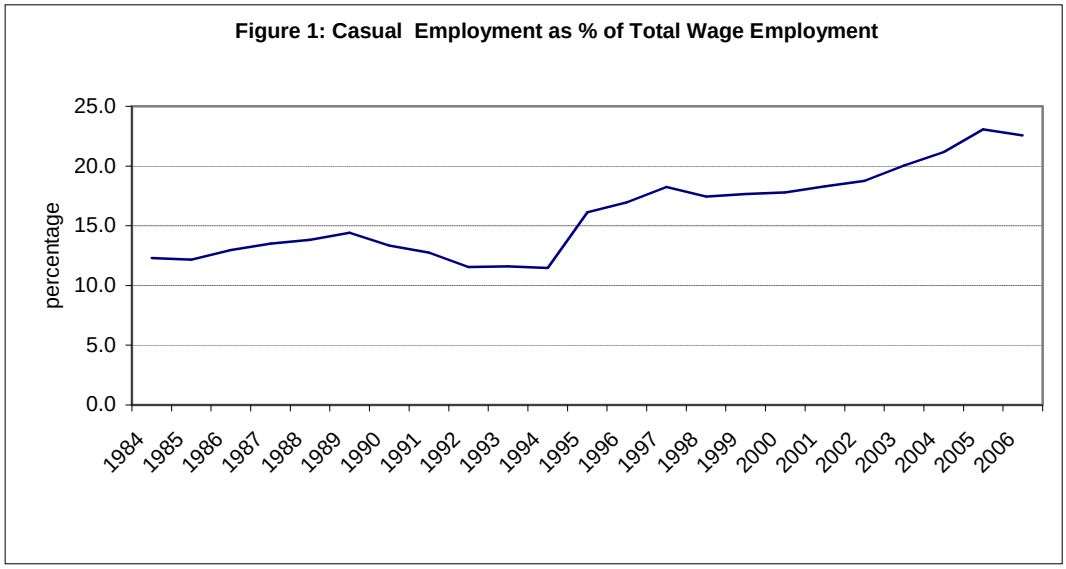
1. Introduction

Kenya's manufacturing sector has been the main conduit for the country's integration into regional and world markets. The sector is large by regional standards and accounts for over 10% of Gross Domestic Product (GDP). It is a major source of employment in urban areas and possesses substantial backward and forward linkages to the rest of the economy and, is key to achieving the country's vision of becoming prosperous and globally competitive by 2030. Manufacturing exports are targeted at both regional markets, including the Common Market for Eastern and Southern Africa (COMESA) and the East African Community (EAC) as well as European and American markets. Starting with agro-processing, Kenyan manufacturers have in recent years, thanks to the African Growth Opportunity Act (AGOA) and associated export processing zones, increased exports of textiles, mainly targeting the US market.

However, while export-led growth is a policy priority in Kenya, its impact on employment especially in urban areas, has only received limited attention. The available data show that there has been substantial casualisation of employment—casual employment as a proportion of total formal sector employment shows a marked rise since 1994 (see Figure 1). Informal and precarious forms of employment have gained momentum, as the system evolves towards employment of a diverse pool of irregular, flexible or casual workers[1] with no formal labor contracts and employment benefits. Most of these employment effects have been witnessed during the period of intense trade liberalization and openness. However, there has been little empirical work on these issues. Using the manufacturing sector as a case study, the paper investigates the employment outcomes in terms of workforce composition (i.e. temporary or casual versus permanent/regular and skill

[1] In the literature, such forms of employment are also referred to as "non-standard forms of employment" or "precarious employment". Part time workers in the context of this paper work under similar conditions as casual workers but for relatively shorter periods—periods of three months or less. In both cases, payment is often at end of day or week or piece rate.

composition) and the extent to which the emerging employment patterns can be attributed to the firms' export-orientation.[2] The empirical evidence for the study derives from survey data collected on a number of manufacturing firms in Kenya under the World Bank's project "Regional Programme on Enterprise Development (RPED)" in the early 1990s and recently in 2003.



Source: Author's computation from Republic of Kenya Economic Surveys (various issues)

2. Theory and Evidence

2.1 Theoretical Literature

Much of the available literature regarding trade and labour market outcomes is discussed in the context of developed countries, based on the concern that demand for unskilled labor has fallen substantially relative to skilled labor leading to increased wage inequality. At the heart of the debate lie the competing forces of globalization, namely trade and trade liberalization, and skilled-biased technology (see Wood 1994, 1995, 1998; Autor et al., 1998, Berman et al., 1998; Katz and Murphy 1992).

[2] The term 'export orientation' as used in the paper refers the exporting status of a firm—i.e. whether a firm exports or not.

The main theoretical framework has been the standard Heckscher-Ohlin (H-O) model, which says that a country tends to export goods that use its abundant factor intensively and import goods that use its scarce resource factor intensively (Sen 2001). Any trade-induced change in a country's product prices (e.g. through reducing trade barriers) leads to a shift of resources towards the industries whose relative profitability has increased, which in turn, leads to an increase in demand for factors used relatively intensively—abundant unskilled labour in the case of developing countries like Kenya. However, the applicability and relevance of H-O model to developing countries has been subject of debate given its extreme assumptions. Besides, the H-O models highlight importance of factor endowments for trade at a broad country level and are not really designed to explain workforce composition at the firm level. They also make a strong assumption of homogenous firms. Nonetheless, they provide useful insights for the analysis of labour market outcomes in Kenya and other developing countries.

At the micro level is the firm-level theory with a growing literature, which emphasizes (observable) firm-level factors. Studies have generally found that exporting firms have more human capital and higher productivity than non-exporting ones. This has been attributed to the technological innovations or learning-by-doing enabled by the importation of intermediate and capital goods through trade (Mouelhi 2005). However, issues of workforce composition and how they relate to trade orientation are not emphasised in the firm-level literature. Trade liberalisation has reinforced the competitive pressures of global markets and intensified the search for lower production costs, whereby firms seek low-cost and 'flexible' labour relations in their production operations (Heintz and Pollin, 2003; Beneria 2001, Feder 1982). This has led to a shift to informal employment arrangements and exacerbated use of precarious types of employment (Carr and Chen 2002; Beneria 2001—a move towards *casualisation* of labour. The fastest growing part of the labour force in many countries including Kenya has been in informalised work or temporary and part-time employment. Mangan (2000) observes that for each individual firm, non-standard employment

requirements will vary with size, type of productive process, nature of product(s) sold and the competitive environment in which they operate. Smaller firms may be more attracted to the potential for cost savings offered by non-traditional employment or fearful of the legal implications of hiring traditional workers.

Generally, with increased competition locally and globally, firms have resorted to a variety of strategies to achieve adaptability and flexibility in their effort to manage risks and maximize profits in the competitive arena. Broadly, three approaches to workforce adaptability have been identified; numerical flexibility, functional flexibility and reward or wage flexibility. In practice, some of these approaches overlap.

2.2 Empirical Literature

Most of the empirical literature on trade and labour market outcomes typically focus on developed countries, and recently on East Asia and Latin America. Empirical evidence on African Continent is severely limited. For example, in a review of literature on globalisation and labour market outcomes in the South, Sen (2001) provides only two empirical studies in Africa—for Morocco by Currie and Harrison (1997) and Mauritius by Milner and Wright (1998). Moreover, most of these are macro or industry-level based. Paucity of firm-level empirical studies based on African data has been relieved lately by the World Bank's RPED project, which has enabled the collection of data on manufacturing enterprises for a number of African countries. The surveys were first launched in the early 1990s. A number of recent analyses have used these data to study firm behavior under different trade regimes in Africa. Bigsten and Söderbom (2005) provide an excellent review of research results from studies based on RPED surveys. For example, using these data for a sample of African countries, including Kenya, Bigsten et al., (2004) and van Biesebroeck (2005) concluded that exporting had a positive effect on productivity. Kimuyu (1999) found similar results, noting further that labor-intensive firms were more likely to export, and also export a greater share of their

production than non-exporting enterprises. Söderbom (2004) also found that there are size effects to exporting and concluded that when firms grew, exports grew too. However, the trade and employment nexus has elicited little study in Kenya. The limited attempts are by Sen (2002), Manda (2002 and 2004) and Manda and Sen (2004) who use highly aggregated industry-level data and do not divulge the effects of trade on workforce flexibility. This paper focuses on the impact of exporting on the composition of the workforce, i.e. employment of different categories of workers. Additionally, more recent data based on 2003 RPED survey is also employed, allowing comparison with the earlier surveys of 1990s.

3. Method of Analysis and Data

Both exploratory and econometric regression analyses are employed. In the case of the latter, an equation for proportion of casual workers in the workforce, L^c is specified, with relative wage, w^c (wage of casual workers relative to total wage) and real output Q as basic explanatory variables. Trade impact at the firm level is captured in terms of exporting status of the firm[3]. From the literature, mode of operation (whether a firm operates more than one shift or not) and number of competitors (whether a firm has over five competitors) are included as proxy variables for production capacity and competitive environment in which firms operate, respectively. These are denoted P_i and C_i, respectively. Unionization (whether a firm have unionized employees or not), U is also included to capture institutional factors such as easing of labor laws. F refers to firm-level variables location and sector dummies. e is the error term. The estimable equation is thus specified as:

$$L^c{}_i = \sigma_0 + \sigma_1 \omega^c{}_i + \sigma_2 InQ_i + \sigma_3 X_i + \sigma_4 F_i + \sigma_5 P_i + \sigma_6 C_i + \sigma_7 U_i + e_i$$

[3]At the industry level, trade impact is commonly captured by export penetration (export-output ratio). However, this variable is not available in the firm-level data sets used.

Given the possibility that some firms were interviewed more than once, the above equations can be re-specified by incorporating a time dimension, in which case panel data assumptions and techniques are employed in the estimation.

Data are from the RPED surveys conducted in Kenya in 1993-1995 and 2003. The earlier surveys covered firms in food, textile, wood and metal manufacturing in Nairobi, Mombasa, Nakuru and Eldoret. 224 firms were interviewed in 1994, 216 in 1994 and 218 in 1995. The four sectors comprised about 73 percent of manufacturing employment, providing a reasonably comprehensive picture of the manufacturing sector in Kenya.[4] The 2003 survey had more sub-sectors: agro-industry, wood and furniture, textile and garments, metal, chemical and paints, construction, plastics, printing and publishing.[5] Out of the 368 firms randomly selected, 282 firms completed the survey. The data used in the paper have been cleaned from observations, which could be seen to be erroneous or incomplete.

For robustness, a variety of techniques were used to test data quality and consistence. Unless otherwise specified, estimations were done using ordinary least square (OLS) techniques. Issues of firm heterogeneity or unobserved effects such as management ability and other organizational attributes that might be correlated with exporting status of firms were taken into account by using panel data techniques, albeit based on a short period (1993-1995). Both fixed and random effects model are estimated. Fixed effects model assumes that unobserved effects (omitted variables) differ between cases (in this case, across firms) but are constant over time. However, it is not possible to estimate coefficients on time-invariant variables, and all inference is conditional on the unobserved effects in the sample. The random effects approach assumes that the unobserved effects are not

[4] For a detailed description of the Kenyan RPED data, see Aquilar and Bigsten (2002).

[5] For ease of comparison where necessary, these are re-classified under the four sectors (food, wood, textile and metal and chemicals) plus the additional one; paper, printing and publishing. This classification matches that used in the earlier surveys as much as possible.

correlated with the explanatory variables, i.e. they are random and can vary over time, and thus treats them as part of the error term. However, for the recent data based 2003 survey, estimations are based on cross-section data since panel data is not available.

Heteroskedasticity occurs often in cross-section data. This is addressed using the commonly applied White's heteroskedasticity consistent standard errors approach. In the firm-level literature, endogeneity between firm size (employment level) and exporting is often assumed in export determination equations. The question is whether this should be the case in regard to proportion of casual workers (or proportion of permanent workers) and exporting. To establish, a test for endogeneity is conducted using Durbin-Wu-Hausman chi square test (and Wu-Hausman F test).

4. Results

4.1 Descriptive analysis

Overall, the proportion of firms directly exporting their product(s) increased from 21.5 percent in 1993 to over 50 percent in 2003 (Table 1). This increase in export orientation can be attributed to increased trade openness, following the implementation of trade liberalization reforms and export promotion programs such as the introduction of EPZs (in the early 1990s) and the AGOA initiative (in 2000), which spurred exports in the textile and garments industry. Proportion of exporting firms was found to be higher among large firms, with over 60% of large scale firms (with 100 and above employees) exporting their product(s). This could be due to scale economies associated with large firms.

Table 1: Proportion (%) of exporting firms by sector

Sector	1993	1994	1995	2003
Food	24.5	26.5	29.6	43.8
Textiles	13.6	18.4	23.1	69.2
Wood	15.3	18.6	15.5	50.0
Metal	34.0	30.4	37.0	56.6
Printing &publishing				52.9

All	21.5	23.5	26.2	54.2

Source: Author's computation from RPED surveys

In terms of employment, Table 2 shows a consistent rise in the use of precarious forms of employment (casual and part-time workers). This may have been largely undertaken as a cost-cutting strategy as the latter usually do not enjoy fringe benefits and other employment benefits such as severance pay, medical allowances, etc. The proportion of part time and casual workers increased to 36 percent in 2003 from 28 percent in 1993. With increased competition, global trends show that firms seem to be using one or different forms of workforce flexibility as adjustment strategies. From a glance, Kenya's manufacturing sector seems to depict more features of numerical flexibility.[6]

Table 2: Number and proportion of employees per firm by employee status

Variable	RPED 1993	RPED 1994	RPED 1995	KMES 2000	RPED 2003
Average no. of workers					
Casual/part time workers	23	23	32	48	86
Permanent/regular workers	94	57	63	56	117
All workers	117	80	95	104	202
Sample size (n)	222	214	218	224	260*
% of total workers					
Casual/part time workers	28	30	33		36
Permanent/regular workers	72	70	67		64
Total	100	100	100		100

Source: RPED Surveys, with KMES 2000 obtained from Manda and Sen (2004), Table 7.
* of this sample, 4 firms did not indicate the disaggregation of workforce.

1990s data show relatively high proportion of casual and part time workers among micro and small firms compared to medium to large firms (Table 3). Arguably, it is small firms that would find it relatively harder to compete, and would therefore, want to rely more on the use of flexible and cheaper forms of employment to cut on costs. However, the percentages based on 2003 data seem to indicate that the proportion of casual and part time workers is now rising with the firm size, with about 39 percent of workers in large firms working as part time and casual workers. Basically, over

[6] *Numerical flexibility* is the ability of firms to change the number of people they employ by making use of part-time, temporary and seasonal employees (whose contracts can be terminated using liberal provisions on hiring and dismissals), and short-fixed term contracts, freelance work, homework or outwork.

one-third of workers in medium and large-scale firms fall under non-standard forms of employment.

Table 3: Composition of employment by firm size (%)

	Micro	Small	Medium	Large
1993:				
Casual& part time	33.8	35.3	23.3	20.3
Permanent	66.2	64.7	76.7	79.7
1994				
Casual& part time	28.0	29.4	34.0	25.6
Permanent	72.0	70.6	66.0	74.4
1995				
Casual& part time	37.6	35.2	29.9	27.6
Permanent	60.6	64.8	70.1	72.4
2003				
Casual& part time	-	31.5	35.2	38.5
Permanent		68.5	64.8	61.5

Micro (≤ 5 workers), small (6-20), medium (21-99) and large (≥ 100)

Source: Author's computation from RPED surveys

Exporting firms generally account for a larger proportion of employment in the manufacturing sector (Table 4). However, the data shows a declining trend, from 78.5% of all workers in 1993 to 54.2% in 2003, with a rising proportion of workers in non-exporting firms. Thus, although the proportion of exporting firms increased between 1990s and 2003, contribution of exporting firms to total employment did not increase as expected. This seems to be line with the shrinkage of employment in the formal sector witnessed during the period. The percentages in Table 4 further indicate that casualisation phenomena or use of non-standard forms of employment is not restricted to exporting firms only, though exporting firms employed the largest number of casual workers by the virtue of their large firm size. In fact, the 1993 and 1995 surveys data show that non-exporting firms had a higher proportion of total casual and part time workers among the total workforce (30 percent and 35 percent respectively). However, proportion of casual and part time workers in exporting firms increased from 26 percent in 1995 to 37 percent in 2003, with exporting firms having a higher proportion (see Table 5.5 and Figure 5.1).

Table 4: Proportion of total, casual and permanent workers by firms' exporting status

	Exporting	Non-exporting
Proportion of all workers by exporting status of firms (%)		
1993	78.5	21.5
1994	76.5	23.5
1995	73.8	26.2
2003	54.2	45.8
Composition of workers between casual/part time and permanent by exporting status (%)		
1993		
Casual & part time	18	30
Permanent	82	70
1994		
Casual & part time	31	30
Permanent	69	70
1995		
Casual & part time	25	35
Permanent	75	65
2003		
Casual & part time	37	35
Permanent	63	65

Source: Author's computation from RPED surveys

In terms of skill composition, there was a general shift of firm employment towards a more skilled labor force as reflected by the rise in the level of education of the workforce. The proportion of workers with primary education declined steadily while that with secondary and higher education increased, with over 60 percent of the workers having attained secondary school education as per 2003. The 2003 survey particularly show a steady increase in the proportion of workers with university education. Table 5 shows composition of permanent workers by education level, for exporting and non-exporting firms, based on data for 2003[7]. In absolute terms, exporting firms employed more workers of all education categories. In terms of proportions, exporting firms employed a higher proportion of workers with secondary school education (67%) relative to non-exporting (58%). Similarly, the proportion of workers with primary education was less in exporting

[7] This question was asked only in reference to permanent workers and therefore excludes casual workers.

firms (19%) compared to non-exporting firms (28%). Proportion of workers with university education was slightly higher for the former (11%) than the latter (10%).[8]

Table 5: Composition of workers by education level, 2003

	Exporting firms		Non-exporting		All firms
	Mean	Std dev	Mean	Std dev	Mean
Average number of workers					
Less than 6 years	4	20	1	5	3
Primary	31	108	14	38	23
Secondary	87	122	38	76	63
University(all degrees)*	12	24	8	32	10
Masters and PhD	1	3	0.4	1.1	1
(as a % of total workers)					
Less than 6 years	2.8	8.3	3.2	9	3.4
Primary	19	21.4	28	28	23.4
Secondary	67	24	58	30	62.6
University (all)*	11	12.3	10	18.5	10.6
Masters and PhD	0.8	1.68	1	4	0.9
Female workers (% of total workers)					
All female	15.3	15.2	13	14	14.2
Less than 6 years	0.4	1.5	0.3	1.8	0.4
Primary	2.5	6.3	3.1	8.7	2.7
Secondary	11.0	11.8	8.0	10.2	9.4
University (all)*	1.5	3.5	1.7	5.7	1.6

*University education includes first degree, masters and PhD.

Source: Author's computation from RPED surveys

In terms of gender, the data shows that total female workers as a percent of total permanent workers is slightly higher for exporting firms (15%) compared to non-exporting firms (13%). Overall, the proportion of permanent female workers (based on education attainment) is about 14%. Given that a substantial amount of women also work as casual or part time workers, it is likely that this is an underestimation of the share of female employment. Female employees with secondary school education constitute the highest percentage among education categories being slightly higher for exporting(11%) than non-exporting firms (8%). There is no much difference in the proportion of female workers with university education.

4.2. Regression Results

[8] Defining skill in terms of production (unskilled) and non-production (skilled) yielded similar results.

This section provides estimated econometric results. Data from the early 1990s was used to create a panel. Since it was not possible to trace the same firms in the 2003 survey and given the time lapse, separate estimations were conducted for 2003. The main draw back encountered in creating panel data based on the early RPED waves of 1993, 1994 and 1995 was the high attrition rate of firms, particularly after the first wave. Consequently, the panel was created using data for 1994 and 1995 waves only. There were 186 firms interviewed twice (i.e. in both waves of 1994 and 1995), making 372 observations used in the balanced panel data analysis.[9] Both fixed and random effects model are estimated and results compared to pooled OLS regressions where possible.

The panel data models for proportion of casual workers[10] (dependent variable) are reported in Table 6a together with pooled OLS results for comparison. The explanatory variables are exporting status of the firm (1=firm exports and 0 otherwise), real wage rate i.e. average wage in a firm (firm's total wage bill divided by total employment)[11], real output, union status of firm's employees (i.e. firms with unionized employees =1 and 0 otherwise), mode of operation (1= firm operates more than one shift and 0 if firm operates only one shift). Arguably, more shifts can be taken as indication of more capacity and hence more ability to employ more workers. Additionally, firms that face stiff competition (1= a firm has over 5 competitors and 0 otherwise) would prefer relying on casual workers to cut down on costs. Real variables (output and average wage) are in natural logs. These variables were computed by deflating the nominal variables by consumer price indices for the respective years. Other variables are sector, location and year dummies (1995 is the omitted category). The metal sector and Eldoret town are the omitted categories for the sector and location dummies, respectively. Notice that location and sector dummies are automatically dropped from the fixed -effects model since they are constant over the 2-year period. Besides proportion of

[9] The actual sample used in the analysis could be less since there are variables with less than 372 observations.
[10] Part time workers are considered as half full time casual workers in the empirical analysis.
[11] Ideally, relative wage of casual workers would probably have been a better wage variable (as initially specified in the equation for proportion of casual workers) rather than average firm wage. However, in the absence of the former, the latter was used. Arguably, variations in relative wages across firms can be sufficiently captured by controlling for sector and location dummies (as explicitly done in the OLS regressions).

casual workers, regressions are also conducted for proportion of permanent workers, as well as all the workers. The regression results for the former are reported in Table 6b. OLS cross-section data results for both proportion of casual as well as proportion of permanent based on the 2003 survey data are reported in Table 7.

Heteroskedasticity problem was addressed by estimating all the models with robust-heteroskesdastic option (which apply heteroskedasticity-consistent standard errors). The endogeneity of the export variable was tested using the Durbin-Wu-Hausman (and Wu-Hausman) tests. Since this requires estimating an Instrumental variable (IV) regression, the export variable was instrumented using the proportion of imported raw materials. This was motivated by correlation of this variable with exporting. For both equations (for proportion of casual and permanent workers), we failed to reject the null, which states that the OLS estimator would yield consistent estimates (see the results and test statistics in Appendix Table 1). Discussions are therefore, based on the OLS-based results presented below.

Table 6a: Proportion of casual workers (panel data models & pooled OLS—1994-95)

	Fixed Effects		Random Effects		Pooled OLS	
	Coef.	t-statistic	Coef.	t-statistic	Coef.	t-statistic
Constant	-0.02	-0.04	0.44	2.22**	0.46	2.69***
Exporter	0.12	1.89*	0.01	0.23	-0.01	-0.17
Real output	-0.0002	-0.01	-0.03	-1.76*	-0.03	-1.87*
Real wage rate	0.02	0.79	0.03	1.48	0.03	1.57
Operate more than one shift	-0.002	-0.03	0.03	0.67	0.03	0.66
Have unionised employees	-0.01	-0.20	-0.05	-1.32	-0.05	-1.22
1994	0.01	0.43	0.01	0.40	0.005	0.15
Have over five competitors	0.04	0.76	0.06	1.79*	0.07	2.07**
Food			-0.01	-0.12	-0.01	-0.27
Wood			-0.05	-1.05	-0.07	-1.51
Textile			-0.16	-3.19***	-0.16	-3.66***
Nairobi			-0.10	-1.24	-0.11	-1.61
Mombasa			0.06	0.61	0.05	0.67
Nakuru			-0.04	-0.45	-0.05	-0.66
F-statistic	0.80		37.0***		4.0***	
R-squared	0.03		0.13		0.13	
RESET					0.82(0.48)	
No. of observations	324		324		324	

*** ** * denote level of significance at 1%, 5% and 10% respectively

Table 6b: Proportion of permanent workers (panel & pooled OLS—1994-95)

	Fixed Effects		Random Effects		Pooled OLS	
	Coef.	t-statistic	Coef.	t-statistic	Coef.	t-statistic
Constant	1.11	2.59***	0.52	2.53***	0.50	2.90***
Exporter	-0.15	-2.17**	-0.03	-0.73	-0.01	-0.27
Real output	-0.002	-0.11	0.03	1.89*	0.03	1.98**
Real wage rate	-0.03	-0.93	-0.02	-1.37	-0.03	-1.43
Operate more than one shift	0.0005	0.01	-0.03	-0.74	-0.03	-0.76
Have unionised employees	-0.03	-0.67	0.03	0.88	0.03	0.87
1994	-0.02	-0.63	-0.02	-0.68	-0.01	-0.29
Have over five competitors	-0.04	-0.86	-0.06	-1.83*	-0.07	-2.15**
Food			0.002	0.04	0.01	0.23
Wood			0.04	0.81	0.06	1.28
Textile			0.17	3.17***	0.17	3.74***
Nairobi			0.11	1.23	0.11	1.62
Mombasa			-0.06	-0.63	-0.06	-0.77
Nakuru			0.03	0.30	0.04	0.45
F-statistic	1.11		35.5***		4.1***	
R-squared	0.04		0.13		0.13	
RESET					1.0(0.39)	
No. of observations	324		324		324	

*** ** * denote level of significance at 1%, 5% and 10% respectively

Table 7: Regression Results for Proportion of casual & permanent workers (2003)

	Propn. of Casual		Propn. of permanent	
	Coefficient	t-statistic	Coefficient	t-statistic
Constant	0.27	1.07	0.69	2.76***
Exporter	-0.04	-0.83	0.04	0.85
Output	0.03	1.71*	-0.04	-2.46**
Average wage rate	-0.05	-2.57**	0.06	2.61***
Firms with unionised employees	-0.05	-1.14	0.06	1.33
Agro industry	-0.04	-0.73	0.06	1.06
Wood	0.06	0.69	-0.04	-0.53
Textile	0.06	0.88	-0.04	-0.55
Chemical & paints	-0.04	-0.55	0.09	1.17
Construction	-0.12	-1.57	0.16	1.99**
Plastics	0.01	0.18	-0.005	-0.06
Paper & printing	-0.05	-0.71	0.08	1.29
Nairobi	0.18	3.63***	-0.09	-1.26
Mombasa	0.31	4.89***	-0.30	-4.00***
Nakuru	0.27	3.46***	-0.21	-2.33**
Kisumu	0.19	2.14***	-0.13	-1.22
Proportion of workforce that use computer	-0.31	-3.27***	0.38	3.88***
F-statistic	3.37***		5.3(0.0)***	
R squared	0.25		0.328	
RESET	1.72(0.16)		3.32(0.02)**	
No. of observations	155		155	

*** ** * denote level of significance at 1%, 5% and 10% respectively

Proportion of casual workers

The results for the random and pooled OLS models (Table 6a), as well as those based on 2003 data (Table 7) show insignificant exporting effect on composition of casual workers in total employment. This follows from the exploratory analysis (which did not show a clearly distinct or obvious positive relationship between export-orientation and proportion of casual workers). However, there could be (omitted) unobserved effects not picked up by the other models since the fixed-effects model shows that export variable is positive albeit not highly significant (it is significantly different from zero only at 10 percent level of significance). Hence, the evidence of exporting leading to a higher proportion of casual workers is weak. The usual test statistic for Ramsey regression specification error test (RESET) for the OLS model is not significant, implying that there is no misspecification error.

The choice between fixed effects versus random effects models is statistically testable using Hausman test. The test checks a more efficient model against a less efficient but consistent model to ensure that the more efficient model also gives consistent results. Unfortunately, the test could not be computed due to small-sample problem. Nevertheless, the results across the three models are fairly similar. For instance, all the three models in Table 6a show that real wage rate, operating more than one shift, unionized firms and 1994-year dummy are insignificant. The insignificance of real wage rate might probably be due to the fact that real wage is correlated with output. Also, the average wage might not be a better proxy for the wage rate of casual workers, given earning disparity between casual and permanent employees. The fact that most casual workers are not unionized might explain the insignificance of the union variable. However, given that this variable is also insignificant for proportion of permanent workers and in regressions based on 2003 data could be taken as an indication of lack of effective or influential role of trade unions in the manufacturing sector.

The random effects and the pooled OLS models show that firms that faced stiffer competition (i.e. firms that had over five competitors for their principal product) employed a higher proportion of casual workers. Intuitively, this makes sense given that such firms would be under more pressure to cut-down on costs (e.g. by resorting to casual workers) to remain profitable. However, the fixed-effects model shows that this variable is not significant, implying that there is likely to be unobserved effects that are correlated with the variable, such that once they are taken into consideration, it ceases to be significant.

In relation to the metal sector (omitted sector), the textile sector employed a significantly lower proportion of casual workers (in the early 1990s). The textile sector was one of the most affected sectors following trade liberalization in the early 1990s. The negative relationship can, thus, be explained in line with the lay-offs or retrenchment following collapse of some firms. The descriptive analysis showed that the sector also had the least proportion of exporting firms. On the other hand, location and year dummies were found to be insignificant in all the regressions for the 1990s. The coefficient for output is negative but significant at only 10% significance level under the random and pooled OLS models in Table 6a.[12]

Results based on the recent data of 2003 survey in Table 7 show that both the output and the wage rate have the expected signs (and are significant at 10% and 5% levels respectively). That is, the higher the output, the higher the proportion of casual workers and, the higher the average wage, the lower the proportion of casual workers. However, given the size of the coefficients, the impact is quite small. All location dummies have positive and significant coefficients, implying that compared to firms located in Eldoret (omitted category), firms located in other towns (Nairobi, Mombasa, Nakuru and Kisumu) significantly employed a higher proportion of casual workers. This is an

[12] Using real output per worker instead of real output yielded similar results.

indication that casualisation of workforce phenomenon is not restricted to specific towns only, but has rather become widespread across towns in recent times.

Changes in technology are often cited as a factor in increased use of non-standard workers (Mangan 2000). Given structural changes that have taken place since the early 1990s, particularly in the area of information technology, additional variable—proportion of workforce that regularly use a computer—is included as a proxy for technology variable in the 2003 regressions. The impact is negative. This is expected since in most cases, casual workers tend to be low-skilled, and thus where skills such as information technology are required, casual workers may not be the best option. This variable can also be taken as an indication of the changing industrial environment particularly with the recent revolution in area of information and communication technology. All the sector dummies (in relation to metal sector) are not significant. As already noted, the impact of exporting was found to be insignificant.[13] Similarly, the coefficient for firms with unionized employees is not significantly different from zero.

We also re-estimated proportion of casual and permanent workers for 2003 using seemingly unrelated regression (SUR) in which the equations are estimated as a set, based on the argument that the error terms of the two equations may be correlated. That is, we can argue that exogenous shocks affect the demand of both permanent and casual workers in an industry or firm. OLS estimates will not be efficient if there is contemporaneous correlation of error terms of the two equations. Therefore, SUR increases efficiency. The SUR results are reported in the Appendix Table 2. Note that the coefficients are same in both cases (OLS and SUR) but there is a slight

[13] Further analysis conducted using the number (log) of casual workers rather than proportion of casual workers indicated similar results for the export variable—slightly significant for the fixed effects but insignificant for the random and pooled OLS models. However, there were variables that, though did not affect the proportion, had an impact on the number of casual (and permanent) workers employed e.g. the 1994 dummy variable had a negative effect while impact of output was positive. The analysis for 2003 data also showed an insignificant exporting effect but significant output and wage elasticities.

variation in the t-statistics. Overall however, there is no much change for most variables including the export variable, which remains insignificant. Thus, it is possibly the case that casual and permanent or regular workers do not necessarily face the same shocks or they are affected differently by exogeneous shocks. Intuitively, casual workers are relatively more vulnerable to shocks—e.g. can be fired or laid-off easily without notice.

Proportion of permanent workers

The panel data models for proportion of permanent workers are reported in Table 6b alongside the pooled OLS results. Broadly, the results show opposite coefficient signs to those obtained for proportion of casual workers. For instance, the textile sector dummy is positive and significant in all the regressions for early 1990s. Like before, the pooled OLS and random effects models, as well as OLS results for 2003 (Table 7) show that the export variable is not significant. However, the fixed-effects model shows that exporting has a negative effect on the proportion of permanent workers employed (significant at 5% level of significance). This seems to attest to the decline of proportion of permanent workers as alluded to in the descriptive analysis and the fact that there might be unobserved effects such as quality of management that are correlated to exporting. However, the model does not explicitly include the time invariant variables such as sector dummies. All the three models in Table 6b show that real wage rate, operating more than one shift, unionised firms and 1994-year dummy are insignificant.

Regressions for 2003 show that the higher the proportion of workforce that use computers, the higher proportion of permanent workers. Average wage rate is significant but positive, while output is negatively related to the proportion of permanent workers employed. This could possibly imply that permanent workers are probably more productive and efficient, most likely because they are relatively more skilled.

All workers

Estimations are also conducted using equation for log of all workers. The panel data results are reported in Table 8a while estimations for 2003 are reported in Table 8b. Contrary to the results for proportion of casual and permanent workers, the export variable was found to be significant and positive in all the regressions except in the fixed effects model. The results for 2003 also show a positive exporting effect. Again, it is possible that unobserved fixed-effects are correlated with exporting, causing an upward bias in the pooled and random effects model estimates. If we assume away the bias created by exporting being correlated with other unobserved effects such as quality of managerial skills, superior technology etc, we can possibly argue that exporting has had a positive effect on overall employment. Based on industry data, Greenaway et al., (1999) find a negative effect of export penetration on employment for UK manufacturing industry while Milner and Wright (1998) find no significant impact for manufacturing industry in Mauritius. Other variables that positively influenced firm employment in the 1990s are output and average wage rate (as depicted by the significant elasticities). The positive wage effect is not expected–perhaps the variable used i.e. the average wage rate in a firm, may not be a good proxy given wage disparities among different categories of workers. Operating more than one shift and unionization variables are only positive under the random effects and pooled OLS models. The dummy for 1994 (in relation to 1995) is significant and negative. 1994 is a year that experienced high turbulence in most macro variables such as inflation and foreign exchange rate following liberalization of the forex market. This affected employment in manufacturing firms negatively. The 2003 data shows positive output and negative wage effects as would be expected—with output having a greater impact.

Table 8a: Log of all workers (panel data models & pooled OLS—1994-95)

	Fixed Effects		Random Effects		Pooled OLS	
	Coef.	t-statistic	Coef.	t-statistic	Coef.	t-statistic
Constant	-0.57	-0.72	-4.04	-10.2***	-4.55	-13.6***
Exporter	0.06	0.29	0.32	2.61***	0.26	2.45**

Real output	0.12	2.26**	0.25	6.34***	0.22	5.12***
Real wage rate	0.17	2.96***	0.32	6.31***	0.39	6.69***
Operate more than one shift	0.14	0.95	0.25	2.08**	0.29	2.45**
Have unionised employees	-0.04	-0.25	0.24	2.11**	0.32	3.20***
1994	-0.14	-3.49***	-0.18	-4.24***	-0.16	-2.25**
Have over five competitors	0.07	0.96	0.07	1.00	0.06	0.72
Food			-0.08	-0.66	-0.16	-1.48
Wood			0.21	1.86*	0.23	2.38**
Textile			0.11	0.75	0.05	0.45
Nairobi			-0.24	-1.24	-0.28	-1.60
Mombasa			-0.41	-1.91*	-0.36	-1.94**
Nakuru			-0.16	-0.80	-0.13	-0.68
F-statistic	5.33***		1282***		163***	
R-squared	0.25		0.85		0.86	
RESET					1.48(0.18)	
No. of observations	324		324		324	

*** ** * denote level of significance at 1%, 5% and 10% respectively

Table 8b: Log of workers (regressions for 2003)

	Coefficient	t-statistic
Exporter	0.40	2.16**
Output	0.54	5.92***
wage rate	-0.40	-3.99***
Firms with unionised employees	0.12	0.81
Agro industry	0.08	0.30
Wood	0.08	0.39
Textile	0.23	1.20
Chemical & paints	-0.02	-0.10
Construction	-0.12	-0.48
Plastics	-0.02	-0.11
Paper & printing	-0.14	-0.62
Nairobi	0.02	0.06
Mombasa	0.22	0.80
Nakuru	-0.03	-0.09
Kisumu	0.53	1.71*
Proportion of workforce that use computer	-0.07	-0.16
Constant	-1.12	-1.15
F-statistic	18.7(0.0)***	
R- squared	0.64	
RESET	4.82(0.01)***	
No. of observations	155	

*** ** * denote level of significance at 1%, 5% and 10% respectively

Overall, the results depict the kind of structural adaptation that has taken place between the early 1990s and the 2000s, most likely in response to the changing economic environment. Additionally,

although export orientation is important, casualisation of workforce is likely to be exacerbated by other factors beyond just exporting.

5. Conclusion and Policy Implications

The analysis shows that, generally, export-oriented firms employed more workers compared to non-exporting firms. However, the proportion of total workers employed by exporting firms shrunk over time from an average of 76.2% in the early 1990s to 54.2% in 2003. Use of non-standard forms of employment has risen—with 36% of all the workers being casual and part time workers in 2003. Casualisation phenomenon is not unique to exporting firms only, although export-oriented firms employed more casual and part time workers by the virtue of their bigger size. The agro-based as well as the textile (and garments) sectors were the largest employers but also ranked highest in use of non-standard forms of employment. Generally, there was a shift towards a more skilled labor force as depicted by a rise in the proportion of workers with secondary and university education, being slightly higher for exporting than non-exporting firms. Employment is male-dominated (over 80% are male), with exporting firms employing a slightly higher proportion of female workers.

The results of regression analysis showed that exporting status (whether a firm exports or not) did not significantly influence the proportion of casual workers. However, exporting had some positive impact on overall employment. Although further analytical attempts using panel data techniques (based on the 1990s data) that control for unobserved effects such as managerial quality or quality of inputs show a positive impact of exporting on casual employment (and a negative one for permanent employment), in general, the empirical evidence on the extent to which exporting determine composition of casual workers in the workforce in Kenya's manufacturing sector is weak. Additionally, real output was not found to be a significant determinant of the proportion of casual workers (though it positively influenced absolute employment level). The negative effect of use of

computers on proportion of casual workers employed reflects the impact of changes in information and communication technology, which may require relatively high skills.

While export-orientation may be a crucial factor, casualisation of the workforce is likely to be exacerbated by other factors beyond just exporting. In particular, the liberalization and deregulation of the labor market policies coupled with high rates of unemployment and poor economic growth in 1990s and early 2000s are likely to have exacerbated the use of non-standard forms of employment. Overall, the results depict the kind of structural changes that have taken place since the early 1990s, in adaptation to the changing trade and economic environment.

While the policy of promoting export-oriented industries as engine of growth and employment creation should be encouraged, there is need for measures that are sensitive to the plight of casual workers and other vulnerable groups such as female and less skilled workers. Although one of the key government's objectives is job creation, attention should also be directed towards the quality of jobs created, particularly in the absence of safety nets for unemployed and vulnerable groups of workers. Strengthening and strict enforcement of labor regulations governing casual and other precarious forms of employment is important. Besides the manufacturing sector, which has been at the centre of export-led growth policies, policy strategies that broadly promote job creation and employment expansion in other sectors of the economy such as agriculture and services should also be encouraged as a step towards addressing the current unemployment problem, which is likely to exacerbate use of casual and other precarious forms of employment. As the economy continues to open up more and more to the global forces, more research focusing on the linkages between trade and labor market outcomes is needed to inform policy, not only in the manufacturing sector but also in the other critical sectors and the economy as a whole. As new data becomes available, future research should also take into account the supply-side related factors.

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Appendix Table 1: Instrumental variable regressions (pooled 1994-95 data)

	Propn. of Casual		Propn. of permanent		Log of workers	
	Coeff.	t-statistic	Coeff.	t-statistic	Coeff.	t-statistic
Constant	0.88	1.71	0.19	0.38	-3.95	-3.58
Exporter	0.41	1.18	-0.34	-1.01	0.88	1.18
Real Output	-0.05	-1.41	0.04	1.29	0.17	2.42
Real wage rate	0.003	0.09	-0.004	-0.15	0.38	5.96
Operate more than one shift	-0.03	-0.51	0.03	0.42	0.10	0.74
Have unionised employees	-0.03	-0.40	0.02	0.34	0.39	2.80
1994	-0.03	-0.65	0.03	0.63	-0.17	-1.89
Have over five competitors	0.13	2.20	-0.13	-2.21	0.17	1.31
Food	0.06	0.71	-0.04	-0.50	-0.02	-0.11
Wood	-0.03	-0.49	0.03	0.55	0.23	1.72
Textile	-0.08	-1.25	0.09	1.48	0.19	1.37
Nairobi	-0.17	-2.02	0.16	1.97	-0.44	-2.39
Mombasa	0.002	0.02	-0.02	-0.20	-0.40	-2.18
Nakuru	-0.13	-1.09	0.13	1.11	-0.38	-1.49
Durbin-Wu-Hausman test statistic	1.03(0.31)		1.31 (0.27)		0.67(0.41)	
Wu-Hausman test statistic	0.97(0.32)		1.31(0.25)		0.63(0.42)	

Appendix Table 2: SUR Regressions for Proportion of Casual & Permanent (2003)

	Propn. of Casual		Propn.of Permanent	
	Coef.	t-statistic	Coef.	t-statistic
Constant	0.27	1.29	0.69	3.24***
Exporter	-0.04	-0.92	0.04	0.95
Output	0.03	1.97**	-0.04	-2.77***
Average wage	-0.05	-2.77***	0.06	3.12***
Firms with unionised employees	-0.05	-1.23	0.06	1.41
Agro industry	-0.04	-0.77	0.06	1.13
Wood	0.06	0.72	-0.04	-0.46
Textile	0.06	0.97	-0.04	-0.58
Chemical & Paints	-0.04	-0.6	0.09	1.28
Construction	-0.12	-1.45	0.16	1.88*
Plastics	0.01	0.18	-0.005	-0.06
Paper & printing	-0.05	-0.56	0.08	0.97
Nairobi	0.18	2.68***	-0.09	-1.25
Mombasa	0.31	4.05***	-0.30	-3.92***
Nakuru	0.27	3.15***	-0.21	-2.38**
Kisumu	0.19	1.9*	-0.13	-1.30
Proportion of workforce that use computer	-0.31	-2.97***	0.38	3.52***
F-statistic	3.24(0.00)***		4.72(0.00)***	
R squared	0.25		0.328	