

DEVELOPMENT AND ENTERPRISES' LABOR DEMAND IN SUB-SAHARAN AFRICA: EVIDENCE FROM PANEL DATA OF FOUR COUNTRIES

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Abstract

Even though Sub-Saharan African countries have implemented various policies to reduce unemployment, the contribution of these policies to employment growth has been less than satisfactory. The objective of this study is to broaden the literature and gain a better understanding of labor markets in Ethiopia and other Sub-Saharan African countries by providing an updated view of labor markets and testing hypotheses about enterprise-level decisions to use labor. Both the rate of employment and the average wage mainly depend on the evolution of production per capita. In Section 2 we present a comparison of production per capita in Ethiopia for the period 1995-2019 in comparison with other African countries, concluding that there was a positive advancement and that it is possible to foster industrial production and development. The study also adds to the limited literature on labor demand determinants at the enterprise level, and also adds new dimensions to African employment literature by describing the role of consistent incentives and efforts in ensuring rapid and sustainable employment growth, which are missing in the context of the sample countries. Pooled panel random effects General Least Squares (GLS) regression model is used to identify the determinants of labor demand. According to the study, the ownership type of enterprise, output, weekly hours worked, and export status all increase labor demand positively and significantly in all study countries. In all nations, the age of businesses has a significant impact on labor demand, but in Ethiopia and Liberia, it has a negative impact. To reduce unemployment, governments should encourage the formation of corporations, incentivize enterprises to work at their full capacity, capitalize on regional integration, and take advantage of regional integration, and the current African Growth Opportunity Acts (AGOA), which provide duty-free trade access to African countries in order to increase export volumes.

Keywords: Labor demand, Export, Working capacity, Employment, Sub-Saran Africa, Model of Firm Size, Development of Ethiopia and other African countries, 1995-2021

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1. Introduction

All of today's developed countries used investment incentives, tariffs, subsidies, and protection to reduce unemployment rates in the early days of their economic

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development. Establishing new businesses and growing existing ones, which heavily rely on government support policies, have been positively correlated with employment growth. Numerous Asian nations have increased employment in the manufacturing sectors through the use of various export and investment incentives.

On the contrary, African countries could not benefit from the prior implementation of economic policies like the Asian continent. Sub-Saharan Africa (SSA) has the highest unemployment rate of any continent which leads to the highest social and political unrest in the continent. The unsatisfactory unemployment reduction from many governments' policy implementation efforts has been explained by a lack of consistent and adequate policy incentives and subsidies (Shikur, 2020; Shikur et al., 2021), and the highest dependence of African economic growth on agriculture, oil, and mining commodities. The rest of the economic sectors like manufacturing and services contribute less to economic growth in Africa (Mbaye and Gueye, 2018). One of SSA's market failures is the labor market (Dillon and Barrett, 2017).

These challenges act as barriers to ensuring economic growth, income distribution, and poverty reduction. The majority of people, particularly the poor, make their living by selling their labor. Furthermore, governments in emerging nations confront difficulties in determining the best strategies to reduce the widening gap between supply and demand in labor markets (UNDP, 2012). Also, African countries have faced a troublesome challenge: how to create enough jobs for their burgeoning labor forces. Thus, identifying determinants of labor demand is essential to making sound policy decisions in the context of African enterprises to create job opportunities for and exploit the abundant African workforce productively in the sectors.

One of the driving forces behind this study is the absence of adequate scientific knowledge and current knowledge in the labor market literature in SSA and developing countries. This study is the first to be conducted in the context of the selected four countries in Africa, where it is uncommon to study the factors that affect labor demand at the enterprise level. This study extends labor market literature worldwide by evaluating the effect of total firm working hours per week and the interaction of working capacity and working hours on labor demand, which was undermined in previous studies. The study focuses on the implications for the design of labor market policy and thus contributes to the growing literature on determinants of existing and new firms' labor demand and the establishment of sustainable and adequate incentive systems.

Thus, the paper identifies determinants of labor demand, and tests hypotheses about firm-level decisions to employ labor in SSA countries. By identifying the factors that affect labor demand; this study fills a knowledge gap in the area of labor demand and supply. It is critical to investigate the factors that influence firm-level labor-use decisions in Sub-Saharan African countries to address low labor demand, help advance scientific knowledge; expand current knowledge, and implement feasible labor market policy. The next section presents theoretical and empirical works of literature. Data and estimation techniques are described in the Fourth Section. The results are presented and discussed in Section 5. The conclusion and policy implications are presented in the last section.

2. Literature

Macro-econometric models have been developed based on the first models of Klein and other authors in the second half of the 20th century to explain effects of real production, real production per head, employment rates, and real wages on employment growth. They usually have had into account the Keynesian approach from the demand side and/or the neoclassical approach from the supply of primary inputs approach. Barro and Lee (1972) showed that a mix of both approaches, through a disequilibrium model should be a good explanation for many countries and periods of time. Guisan (1980) showed that the integration of intermediate inputs at the macroeconomic level is also important, and presented a study for 7 OECD countries that presented a disequilibrium model with 3 regimes: demand, supply of primary inputs, and supply of intermediate inputs.

A good labor market policy, in low-income countries, requires increasing employment rates and real income per capita. In the case of employees, these requirements imply that the number of employees increases at the same time that productivity per worker and the average real wage. A high level of industrial production per capita usually implies increases in production in services and other sectors, as well as increases in real output per capita and real average wages.

At the macroeconomic level, the total employment of a country depends on the demand side and the supply side. As seen in Guisan (2006), (2008), and (2013) and other studies, the supply side depends not only on primary inputs (labor and capital stock) but also on intermediate inputs (depending on domestic production of Agriculture and Industry) and the effects of foreign trade. This last approach takes into account the important positive impact of inter-sectoral relationships, explaining that the development of services depends on the domestic production of intermediate inputs provided by agriculture and industry and on the capacity to import other intermediate inputs. Financing imports depends usually on the capacity to export domestic goods and services, including income from tourism arrivals.

When there is a good development from the demand and supply sides, there is an increase in production per capita in Services and other sectors, which allows high rates of employment in Services with improvements in real wages.

Regarding the econometric model of Section 4, which focused on explaining the number of workers per firm, this study assumes that the quantity of labor demanded rises in proportion to the number of hours worked per week. Firms demand more labor when they function at full capacity (Shikur, 2020, Shikur et al., 2021). Manufacturing productivity is positively associated with manufacturing output growth (due to static scale economies and learning-by-doing), and the size of the manufacturing sector is favorably related to employment growth. Unemployment is inextricably tied to the firm output volume, which modifies the demand curve and determines firm labor demand. The quantity of labor demanded increases as both firm-level output and productivity rise (Freeman and Medoff, 1982; Symons, 1985; Hamermesh, 1993; Berman et al., 1994; Van Zandweghe, 2010; Shikur et al., 2021). They confirmed that labor demand increases with the amount of a firm's output. Labor demand significantly rises with output and falls with wages (Hamermesh, 1993). The quantity of labor decreases with the wage rate. When the wage rate rises, the substitution effect reduces the amount of

labor demand while increasing the amount of capital demand (Hicks, 1963). Lower production costs lead to higher output, whereas higher wages lead to lower labor demand (Ehrenberg and Smith, 2012). Labor demand positively and significantly responds to firms' exports (Hicks, 1963; Were and Kayizzi-Mugerwa, 2009; Kien, 2016; Matthee et al., 2017). In this study, it is postulated that the firm's age leads to more labor demand in the manufacturing production process. The age of a firm has an impact on its managers' experiential learning and experimenting with production processes. The older firm may have a greater chance of accumulating technical knowledge and expanding its size, allowing it to boost its productivity and output. On the contrary, there may be a mismatch between high aggregate employment and the age of firms that has traditionally been attributed to enterprises' constraints, size, and inexperience. There is a match between high aggregate employment and ownership types that have traditionally been attributed to firms' economies of scale and access to strategic resources. Several types of ownership are significantly and positively associated with labor demand (Ehrenberg and Smith, 2012). The hypotheses of this study are derived from both theoretical and empirical literature reviews. According to the null hypothesis, there are complete and competitive markets. In a well-functioning labor market, this results in a testable hypothesis for firm labor demand. The alternative hypothesis assumes that there are labor market failures. Therefore, this study tested the hypotheses for each country under investigation: Benin, Ethiopia, Kenya, and Liberia (Tables 5 & 6).

3. Economic development of Ethiopia in comparison with other African countries

Table 1, shows the evolution of real production per head (PH) in Ethiopia in the years 1995, 2010, 2019, and 2020, in comparison with other African countries. The average annual rate of growth of PH in Ethiopia was 4.14% for the period 1995-2010 and 6.31% for the period 2010-2019, and 4.95 for the period 1995-2019. This rate, for the period 1995-2019, was higher than the African average (1.93%) and the world average (2.06%).

In the year 2019, all the countries in Table 1, except for Egypt's AR, were below the African average. The lower values of PH usually correspond to countries with low average years of schooling and with low values of industrial production per head.

Table 1. Real Production per head, Dollars at 2017 prices and Purchasing Power Parities (PPPs)

Country	PH 1995	PH 2010	PH 2019	PH 2020	% Increase 24 years
Benin	2253	2705	3287	3323	45.89
Egypt AR	6483	10340	11763	11951	81.44
Ethiopia	677	1259	2221	2297	228.06
Kenya	2968	3330	4330	4220	45.89
Liberia	-	1420	1428	-	-
Madagascar	1569	1553	1619	1510	3.19
Av. Africa	3849	5402	5738	4991	49.08

Source: Guisan and Exposito (2001) from World Bank Data.

Note: Av. Africa is the non-weighted average of 53 African countries

Table 2 shows the values of production by sector of Agriculture, Industry (including Building, Manufacturing and Energy) and Services, accordingly to World Bank data.

Table 2. Production per capita (PH) by sector in year 2017 and Population (Pop) in 2000-2017 of African countries (PH in Dollars at 2011 prices and PPPS, Pop in thousands)

Country	QHA Agri	QHI Industry	QHS Services	PH 2017	Schooling 2019	Pop 2000	Pop 2017
Benin	476	446	1147	2069	3.8	7197	11175
Egypt AR	1226	3602	5845	10673	7.4	67285	96443
Ethiopia	583	407	735	1724	2.9	64298	106000
Kenya	1031	499	1431	2961	6.6	30689	50221
Madagascar	405	332	912	1648	6.1	16195	25571
Av. Africa	592	1211	2411	4214	-	743674	1148853
World	766	4771	12149	17686	8.4	5863730	7234726

Source: Guisan and Exposito (2021) from World Bank and UNDP statistics. Notes: PH is the sum of QHA, QHI and QHS, Av. Africa is the non-weighted average of 37 African countries with available data. Schooling is the average years of education received by people 25 ages and older.

We may notice a very low value of Industrial production per head in 4 out of the 5 countries in Table 2. Only Egypt among this group of countries is clearly over the African average although below world average.

The econometric model of Guisan and Exposito (2021) shows an average impact of 1.35 of the increase in QHA+QHI on QHS.

The rate of Employment and real average wages depend on production per capita, and thus the policies addressed to increase production per inhabitant are very important to increase economic development and quality of life.

The educational level of the population is of great importance due to its positive impact on the increase of production per capita, as seen in Guisan, Aguayo and Exposito (2001) and other studies.

In the case of Ethiopia, data from UNDP (2021) show an evolution of average years of schooling of adult population from 1.5 to 2.9 for the period 2000-2019, and the efforts to increase this value are of uppermost importance.

Countries with low levels of education usually have low levels of industrial production per capita and low levels of rates of employment in services per 1000 inhabitants and low wages. The World Bank figures for the percentage of Employment in Services in year 2019 indicates a World average of 51% (of total Employment) while in Ethiopia was only 24%, in Mozambique 21%, Kenya 39%, Benin 43%. Egypt presented a value of 52%, close to World average.

The impact of education on economic development and quality of life is very important as seen in Guisan and Exposito (2021) and other studies.

4. Research Methods of the number of workers at the enterprise level

4.1. Data

The data for this study comes from the World Bank Enterprises Surveys, which are representative firm-level surveys in Sub-Saharan Africa. The study compiles data on

labor demand, output, weekly hours worked, export status, wages, firms' age, and ownership type from the World Bank Enterprises Surveys. Four countries including Benin, Ethiopia, Kenya, and Liberia are chosen based on available data for all variables. Each country's data is pooled separately in this study. The sample size of firms is 318 in Benin. The pooled observations are 513, 948, and 145 in Ethiopia, Kenya, and Liberia, respectively. Benin and Liberia are the countries with missing data on weekly hours worked in the World Bank Enterprises surveys database. This variable is not included in the model only for the two countries.

4.2. Estimation techniques

The panel specification is much more adequate as the extra time series data points give more degrees of freedom, resulting in more accurate estimates. A unique advantage of panel data is that the panel framework allows the modeling of the evolvement of variables through time and space which helps in controlling for omitted variables in form of unobserved heterogeneity which if not accounted for can cause omitted variable bias. Common estimations, such as random effects and fixed effects are employed in fitting the data, where the choice between the two techniques is based on their assumptions.

Similarly, the panel dataset could potentially benefit from GLS, FGLS, and OLS estimations. The GLS and Feasible General Least Squares (FGLS) estimators are the most commonly utilized in the panel model. Several researchers preferred FGLS over GLS. Nonetheless, the FGLS estimator's poor performance prevents it from determining the true value of variance and covariance (Reed and Ye, 2009). According to these authors, one of the best estimators in the panel model is OLS. It frequently suffers from inconsistency, though, because the explanatory variable coincides with the error term. When n and t are close to infinity, all of the FGLS estimators are considered asymptotically efficient. The GLS based on true value variance under the random-effects model is BLUE (Beck and Katz, 1995). The key distinction between fixed and random-effects is whether the unobserved individual effect contains elements that are linked with the model's regressors, rather than whether these effects are stochastic or not (Green, 2008). The random effect assumes that the unobserved heterogeneity is rigorously exogenous i.e. it does not impose any correlation between the unobserved heterogeneity (firm effects) and the regressors. The time invariant variables are included in random-effects model. In contrast, fixed effects assume that individuals' time-invariant variables or unobserved heterogeneity are correlated with error terms as well as fixed effects. The fixed effects model is used to examine the causes of changes within enterprises. Fixed-effects models have the disadvantage of not being able to study time-invariant sources of dependent variables. The time-invariant variables such as gender, culture, and race are absorbed by the intercept in the fixed-effects model. Because the fixed-effects model accounts for all time-invariant variations between individuals, the estimated coefficients of the fixed-effects models cannot be affected by omitted time-invariant attributes. In practice, fixed-effects models are intended to investigate the causes of changes inside a firm. Because it is consistent for each enterprise, a time-invariant variable cannot induce such a change. Fixed-effects models cannot be biased since time-invariant variables are absorbed by intercept. Under the

null hypothesis of zero correlation, the random effect model is efficient; both models are consistent, but the random model is more consistent. If however the null hypothesis is rejected, the fixed effect is consistent and the random effect is neither consistent nor efficient.

The study models firm labor demand as a function of output, hours worked per week, wage rates, export and firm-level characteristics to test the hypotheses as shown in Equation 1. The GLS regression with pooled random effects is used as under:

$$L_{it} = \alpha + \beta \text{output}_{i,t} + \phi \text{hw}_{it} + \varphi \text{exp}_{it} + \theta \text{wage}_{it} + \psi \text{age}_{it} + \gamma \text{ow}_{it} + \varepsilon_{ri} + \mu_{it} \quad (1)$$

Where dependent variable (L) is demand for labor which describes the amount of labor used by enterprises to produce goods and services. It is assumed that coefficients α , β , ϕ , φ , θ , ψ , and γ are the same for all firms and times. Sub-indices, such as i and t represent the enterprise and the year respectively in equation 1. It is assumed that coefficients α , β , ϕ , φ , θ , ψ , and γ are the same for all enterprises and times (do not have i and t subscripts). ε_{ri} is a random effect $\sim N(0, \sigma_r^2)$, it is a permanent component of the disturbance term. μ_{it} is a noise term $\sim N(0, \sigma_i^2)$, it is an idiosyncratic disturbance term. μ_{it} captures differences across firms and times.

The study conducts the Breusch-Pagan Lagrangian multiplier test to determine whether the effects are random or fixed. The random-effects model is chosen to identify labor demand determinants based on the results of the Breusch-Pagan Lagrangian multiplier test. The study also applies the two steps least square (2SLS) method to resolve endogeneity bias (Tang and Wezel, 2015). Since endogeneity bias is a major issue in the study of cause-and-effect relationships. The presence of endogeneity might lead to erroneous and incorrect outcomes. The endogeneity problems are primarily caused by omitted variables. The endogenous explanatory variable is regressed on the selected instrumental factors in the first step. In the second step, the dependent variable is regressed on the residual instead of the endogenous independent variable (Wooldridge, 2010). The study's endogenous variable is output, and the instrumental variables are hours worked per week and firm working capacity. To address potential endogeneity issues, 2SLS estimation is carried out using the following commands (Ivregress2sls ownership types, age of firm, export, wage (Output = hours worked per week, firm working capacity), estatfirststage, estatendog, estatoverid). In the first, the endogenous explanatory variable is regressed on the selected instrumental variables using the command with estat first stage. In the second step, the dependent variable is regressed on the residual in lieu of the endogenous independent variable using command with estatendog (Wooldridge, 2010). The result indicates that the models are free from endogeneity problems for Benin (Wu-Hausman (1, 349)=1.32 (p=0.23)). The overriding identification result indicates that the models are free from endogeneity problems (Sargan score chi2 (2) =1.53 (p= 0.34)) for Benin.

Demand for labor is measured in annual total labor costs incurred for labor in the forms of salaries, wages, bonuses, and social security. Demand for labor is expected to be determined by output, weekly hours worked, export status, wages, firms' age, and ownership type. In this study, the output refers to the values of the firms' products and services produced in a given year. The hours worked (hw) refers to the average hours worked per week which is assumed to affect the labor demand strongly. When the firms work at their full capacity, demand for labor significantly increases because more

production requires more time as well as more labor forces (Shikur, 2020; Shikur et al., 2021). Export status (Exp) is treated as a dummy variable assuming a value of 1 if the company is an exporter of goods and 0 otherwise. The age of enterprises (age) is measured in years. It is expected that older enterprises employ more labor in the production process than younger enterprises. Since the aged enterprises have many managers and employees who have a better experience, skills, and technical knowledge which are useful to boost their productivity and output. The ownership type (ow) is measured categorical scale like 1=if a business type is a sole proprietorship, 2= if the business type is a partnership, and 3= if the business type is a shareholding company. It is hypothesized that labor demand increases from a sole proprietorship to a shareholding company. It is hypothesized that labor demand decreases with the prices of labor. When labor prices rise, the substitution effect reduces the amount of labor wanted while increasing the amount of capital demanded. The average wage is computed as follows:

$$\text{Wage}_{ij} = \frac{C_{ij}}{N_{ij}} \quad (2)$$

Where the subscripts_{ij} represent firm and country, respectively, C_{ij} is the annual total labor cost paid to employees in the form of salaries, wages, bonuses, and social security. The average wage is calculated by dividing the total annual labor cost by the total number of workers. N_{ij} represents the total number of workers in a given year, which includes both full-time and part-time employees.

5. Results and Discussions

5.1. Descriptive statistics results

The results of descriptive statistics at the firm level for sample countries are presented in Table 3. Ethiopian firms have hired the largest total average of workers, including full-time production workers and non-production workers while Liberian firms have hired the fewest average workers. The Kenyan firm produces the greatest amount of average output, whereas the Liberian firm produces the least amount of average output. Liberian firms have the youngest average age of 9 years, while Kenyan firms have the oldest average age of 32 years. Kenyan firms export around 47% of their products to the rest of the globe which is the highest percentage of the study countries. About 13% and 12% of the firm products in Ethiopia and Liberia are exported; Liberia is the lowest of the study countries; Ethiopia is the second-lowest country in terms of export of goods (Table 4).

Table 3. Firm-level summary statistics for selected countries

Variable	Benin	Ethiopia	Kenya	Liberia
	Mean	Mean	Mean	Mean
Production worker at enterprise level	28.76 (61.70)	116.34 (449.35)	108.97 (423.23)	26.31 (52.03)
Non- production workers per firm	27.79 (61.95)	40.90 (101.64)	29.38 (89.45)	16.60 (27.48)
Total workers per firm	56.56 (122.67)	157.23 (518.78)	137.91 (476.67)	42.92 (75.53)
Age of firms in complete years	22.68 (13.54)	23.14 (14.65)	32.22 (18.59)	8.94 (13.049)
Hours worked per week	- -	59.16 (30.62)	67.03 (40.99)	- -
Number of observations(firms)	318	513	946	145
Total workers in the sample	17986	80659	130463	6223

Notes: The standard errors are in parentheses, the number of full-time employees includes both production and non-production workers and total workers are the sum of full-time production and non-production workers. *Source:* Author's calculations from the World Bank Enterprises Survey.

The results indicate that firms in Kenya work more hours per week than in Ethiopia on average. The average firms working capacity are 74% in Kenya, 77% in Liberia, and 63.91% in Ethiopia. Firm working capacity is the proxy variable for hours worked per week that strongly affects the labor market. The firms which work for 24 hours per day decrease the gap between labor supply and demand in selected SSA countries. The previous study classified the wheat processing factories with the same working capacity into two groups. Group one works about 116 hours per week and created job opportunities for 600 employees, on average. The second one works for about 35 hours per week and creates a job opportunity for 100 employees on average (Shikur et al., 2021). The enterprises are working under capacity since investment and export incentives have been inconsistent over time in these countries.

Table 4. Ownership type and firm working capacity and participation in the world market

Variables	Benin	Ethiopia	Kenya	Liberia
Firm working capacity	-	63.91%	74%	77%
Ownership type				
Sole proprietorship =1	47.32%	46.78%	43.34%	66.43%
Partnership=2	33.75%	17.54%	16.17%	26.57%
Shareholding company=3	18.93%	35.67%	40.48%	7%
Export decision				
Yes=1	28.08%	13%	47%	12%
No=0	71.92%	87%	53%	88%

Source: Calculated by author.

5.2. Regression results

The study could anticipate observing no association between labor demand and independent variables if there is a complete and competitive labor market and the null hypothesis is held true. The finding does depend on main covariates; it concludes that labor demand is significantly correlated with explanatory variables. The result of hypothesis testing shows that firm labor demand significantly varies with output, hours worked per week, wage and export decision. In terms of output, the magnitudes of labor demand elasticity are 0.07, 0.10, 0.44, and 0.07 in Benin, Ethiopia, Kenya, and Liberia (Table 5), respectively, which are statistically significant at the 1% level.

The findings point to the need for production and export incentives to boost firm output, weekly hours worked, and the number of exporting enterprises, since this could help to alleviate labor market failures and unemployment by absorbing a large domestic labor supply. The significant and positive effects of these variables on labor demand result in a significant increase in labor demand/employment, it could be meant to minimize the gap between labor demand and supply, lowering the level of labor market failures.

The study finds that firms' output positively and significantly matter labor demand in all study countries. In Benin, Ethiopia, Kenya, and Liberia, an increase in output by one unit raises labor demand by 0.07, 0.10, 0.44, and 0.07, respectively. The findings support theoretical and previous empirical evidence (Freeman and Medoff, 1982; Symons, 1985; Hamermesh, 1993; Berman et al., 1994; Van Zandweghe, 2010). These findings are also consistent with both the historical experience of Asian and developed countries (Szirmai, 2009). The level of employment growth has been coinciding with a significant change in manufacturing production and productivity in Asian countries.

The fastest-growing manufacturing sectors have increased manufacturing employment and output in developed countries. In contrast to this, it is believed that the ability to sustain industrial production growth is critical for achieving high employment rates. For example, Indonesia and Malaysia have achieved comparable or higher rates of employment and output growth than some East Asian 'tigers,' but Indonesia has been unable to sustain its manufacturing employment growth, and Malaysia's industrial dynamism has begun to wane at significantly lower levels of per capita income than the East Asian 'tigers.' China, on the other hand, has been able to achieve a high (and still growing) level of manufacturing employment while having a substantially lower manufacturing employment growth rate than the majority of the nations. This shows that it is not so much the high rates of increase in manufacturing employment or output as it is the ability to sustain them.

In all studied countries with a higher degree of market failure, the wage declines significantly with labor demand. Both conventional wisdom and empirical findings support the findings (i.e. suggesting that the wage rates are negatively associated with labor demand). This paper significantly rejects the null hypothesis at the 1% level. This study finds that wage against firms' labor demand reduces labor market failure.

The Asian nations' experience is consistent with the finding of this study; export decision significantly enhances the level of employment. In comparison to non-export oriented enterprises, recent research finding shows that export-oriented firms absorb a large number of workers (Serti et al., 2010). Exporting enterprises, for example, require four times the labor force of non-exporting firms (82 against 19). Exporters pay their employees a higher wage than non-exporters (Bernard and Jensen, 1997;

Verhoogen, 2008). In general, the evidence in Tables 5 and 6 shows that enterprises in the study nations missed out on competitive market services. This implies that labor market failures lead to a dependency on export and other variables as observed by Dillon and Barrett (2017).

Thus, African governments should develop appropriate policies to increase volumes of exports by utilizing production and export incentives, industrial policy can encourage firms to produce goods for local, regional, and international markets (Shikur, 2022a). In order to decrease unemployment in these countries, governments should take advantage of regional integration and the current African Growth Opportunity Acts (AGOA) that provide duty free trade access to African countries to enhance the volumes of exports by providing export incentives for firms that engage in the production of goods for exports, one possible incentive should be increment in the rate of exported goods (Shikur, 2022b). The findings highlight the need to strengthen regional integration, as this could be meant to create a large domestic market and stimulate large volumes of firms' outputs by increasing incentives.

The result indicates that ownership types significantly enhance the demand for labor in four countries. Since economic scales are positively connected to shareholding company productivity and output growth (owing to economies of scale and learning-by-doing). A company's productivity is positively related to its size (due to technological spill-overs). This is consistent with both the historical experience of currently rich countries (Szirmai, 2009) and the arguments that manufacturing serves as a development engine for the rest of the economy, which increases employment.

Table 5. Results from parsimonious pooled random-effects GLS regression

Variable	Benin	Ethiopia	Kenya	Liberia
Output	0.07** (0.03)	0.10*** (0.01)	0.44** (0.02)	0.07** (0.03)
Number of hours	- -	0.14*** (0.04)	0.30*** (0.06)	- -
Export decision	0.24** (0.11)	0.25*** (0.05)	0.63*** (0.03)	0.24** (0.12)
Wage rates	-0.14*** (0.04)	-0.13** (0.07)	-0.26*** (0.03)	-0.14*** (0.4)
Age of firms	0.01*** (0.002)	-0.16*** (0.009)	0.03* (0.07)	-0.013*** (0.002)
Ownership types	0.10** (0.05)	0.017*** (0.009)	0.024*** (0.007)	0.1** (0.05)
Constant	0.94*** (0.18)	1.27*** (0.32)	-1.10*** (0.17)	0.94*** (0.18)
Number of observations	318	513	948	145
R-square within	0.31	0.04	0.52	0.31
R-square between	0.42	0.85	0.57	0.42
R-square overall	0.37	0.05	0.57	0.37
Wald chi2(5)	77.56	28.60	1010.66	77.56
Prob>chi2	0.00	0.00	0.00	0.00

Notes: *= Significance at the 10% level, **= Significance at the 5% level, and ***= Significance at the 1% level. In parenthesis, standard errors are represented. The total number of full-time production and non-production workers, as well as full-time permanent and seasonal or temporary workers, is used to calculate labor demand.

The study includes the interaction of the working capacity and working hours in model. The aim of the study is to see if adding a new variable will reduce the magnitude or eliminate the significance of the expected interaction of working capacity and working hours and labor demand. The interaction of working capacity and working hours has significant impact on labor demand. The combined variables can only explain a large portion of the variation in the severity of labor market failures. This implies that interactions of two variables could enable firms to operate at maximum capacity, doubling production and labor demand. The governments should work to increase firms working hours and capacity to enhance outputs in manufacturing sectors that are the driving force of employment creation. African governments should implement policies that create an enabling environment for businesses to achieve maximum capital and production efficiencies, which will have a significant impact on labor demand.

Table 6. The effect of the interaction of working capacity and working hours on labor demand

Variable	Benin	Ethiopia	Kenya	Liberia
Interaction of working capacity and working hours	-	0.45***	0.76**	-
	-	(0.09)	(0.31)	-
Export decision	0.39***	0.25***	0.13***	0.25**
	(0.12)	(0.02)	(0.03)	(0.12)
Wages	-0.14**	-0.12**	-0.26***	-0.14***
	(0.03)	(0.05)	(0.03)	(0.04)
Age of firms	0.31***	-0.16	0.03	-0.15
	(0.12)	(0.21)	(0.04)	(0.13)
Ownership type	0.21***	0.27**	0.23***	0.24**
	(0.05)	(0.01)	(0.08)	(0.01)
Constant	3.22***	3.21***	-1.65***	3.22
	(0.25)	(0.45)	(0.82)	(0.75)
Number of observations	318	513	946	143
R-square within	0.32	0.04	0.51	0.32
R-square between	0.42	0.85	0.21	0.42
R-square overall	0.37	0.05	0.51	0.37
Wald chi2(5)	79.17	28.50	959.48	79.17
Prob>chi2	0.00	0.00	0.00	0.00

The heterogeneity of the effect of the age of enterprises on labor demand may imply that investment and export incentives, spatial dimensions and contexts of the countries affect labor demand. The industrial policies of the study countries differ, as reflected in the empirical results showing differences in the sign and magnitude of coefficients of relationships between explanatory variables and labor demand. The effect of the age of firms on labor demand varies across countries. As stated above, the age of firms is significantly and negatively associated with labor demand in Ethiopia and Liberia,

whereas the age of firms significantly enhances the labor demand in Benin and Kenya. The age of firms has a negative effect on labor demand in Ethiopia due to the country's poor industrial base and industrial policies before 2003.

Historically, the command economy of Ethiopia had not provided any assistance to enterprises, and discouraged them by setting ceiling investment capital (\$250000) as well as nationalizing large private enterprises during the Derge regimes. Similarly, the enclave economy of Liberia has provided little assistance to enterprise; countries have provided incentives for enterprises to create continued employment. Specifically, the Ethiopian government imposes high tariffs, exempts customs charges, other taxes charged on capital goods and building materials, holiday tax, and income tax for 2-5 years to enhance employment in diverse industries, import substitution volume, and industrial product export volume.

In the case of export incentives, the government exempts enterprises from sales and value-added taxes, offers them export credit guarantees, and allows them to use export revenues and inward remittances to expand the amount of industrial product exports. Similarly, the Kenyan government has the instruments, such as export incentive schemes, export processing zones import duty and VAT remissions programs to enhance export-oriented production as well as to improve export producers' access to imported inputs at world prices since 1993. Benin has provided investment and export incentives for the investors who must meet a number of criteria, including hiring a certain number of Beninese nationals, protecting the environment, and adhering to nationally accepted accounting standards. Depending on the size of the investment, free trade zone investors may benefit from lower taxation on profits as well as duty-free imports of raw materials and equipment, exported finished goods, or imported industrial equipment for up to one year from the date of business registration.

6. Conclusions and Policy Implications

The paper modeled the factors that influence labor demand in Sub-Saharan African enterprises, which is a significant contribution to the theoretical and empirical works of literature on the African labor market. The study also adds to the limited literature on labor demand determinants at the enterprise level, and also adds new dimensions to African employment literature by describing the role of consistent incentives and efforts in ensuring rapid and sustainable employment growth, which are missing in the context of sample countries. The study gives new wide-ranging evidence from the African perspective—a region that is deemed to have tremendous growth potential, but has lagged behind. This study contributes to the empirical and theoretical literature on the influence of export status, output, hours worked per week, wages and firm characteristics on labor demand. These factors are distinguished as important determinants that could increase the number of workforces in the manufacturing sectors.

The impact of the number of hours worked per week on firm labor demand is significant and positive, implying that firms are operating at maximum capacity, doubling production and labor demand. As a result, African governments should implement policies that create an enabling environment for businesses to achieve

maximum capital and production efficiencies, which will have a substantial impact on labor demand. Combined factors are distinguished as important determinants that could increase the number of workforces in the manufacturing sectors. The governments should work to increase firms working hours and capacity to enhance outputs in manufacturing sectors that are the driving force of employment creation.

Export status has a statistically significant effect on labor demand at the firm level in all countries. The export is linked to a high level of labor market failure, implying that enterprises with good exports should be able to close the gap between labor demand and supply. Export-oriented firms employ more workers than non-export-oriented firms. Exports have been identified as a key driver of economic growth that would lead to employment creation. Export status is strongly associated with firm productivity, which could be associated with learning through interaction with foreign customers and increased competition.

Governments should arrange incentive schemes to promote both local and foreign firms to invest in new business and expand the existing firms which could increase additional labor uses in the production process. The magnitude of the coefficient and percentage of enterprises of export status in Kenya is greater than in other countries. This implies that export-oriented policies significantly determine the level of employment by increasing the number of exporting firms and their volume of production.

Export incentives accelerate the volumes of export in the manufacturing sector. African countries should incentivize exporting firms to increase labor demand which could address labor market failures. Governments should formulate incentive schemes to motivate firms to work at their full capacity, increase output and export goods in order to enhance labor demand. Increasing firms' output, working hours per week, and goods exported have a positive effect on labor demand. These findings imply that improving the level of competitiveness, expanding the size of the domestic market, combating corruption as well as improving government effectiveness is the key to Africa's enterprise development.

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