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Fiscal incentives and jobs: Bang for the buck or wasted resources?

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Fiscal Incentives and Jobs: Bang for the Buck or Wasted Resources?[‡]

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Abstract

This study conducted empirical exploration to quantify the tax incentives given by the government of Ethiopia and examine their effect on employment growth. It used a novel administrative and survey data to achieve these purposes. The analyses showed that firms that hire more workers operate in an environment with significant costs of raw material, professional services, and financial costs. These costs have hindered productivity growth and expansion of employment opportunities. While the incentive variable and its interaction with costs are mostly statistically insignificant in the empirical estimations, they have the expected signs. The elasticity of employment with respect to incentives is positive and decreases with increasing costs. These results indicate that the effect of the incentives may have been mitigated by significant production, distribution, and financial costs. The incentives need to be complemented with other measures that make the business environment more conducive for private investment.

JEL Classification: H25, H81, O14, O25

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1. Introduction

Despite the rapid economic growth recorded in the 2000s and 2010s, creating jobs and employment opportunities has remained a major policy challenge for Ethiopia. The second largest and the rapidly growing Ethiopia population adds an estimated 2 million people to the labor market annually.[1] However, the Ethiopian economy has not been able to absorb the growing labor force, and as a result, unemployment, especially in urban areas, remained elevated. The latest Labor and Migration Survey (LMS) shows that the national unemployment rate has increased to 8% in 2021. Rural and urban unemployment rates were 5.2% and 17.9%, respectively. The high unemployment rates meant that the rapid growth Ethiopia registered in 2000s and 2010s did not translate to an improvement in the living standard of most Ethiopians.

The high unemployment rate has attracted increasing attention from policy makers. The Growth and Transformation Plans (GTP I and GTP II) emphasized on the need to improve the performance of enterprises (micro, small, large, and medium) to generate employment opportunities for the growing workforce and to generate sizeable export revenues. Nevertheless, the achievement of these plans in creating employment and export revenue generation was well below the targets. Recently, the ten-year development plan (2021-2030) identifies high and rising unemployment as a major policy challenge for equitable economic growth Ethiopia. The plan seeks to reduce urban unemployment to 9% by 2030 by creating 15 million jobs.

While such plans are commendable for placing unemployment front and center in the economic reform agenda, achieving these goals requires understanding why the incentive packages offered so far failed to stimulate the labor market and create more job opportunities that keep pace with the growth of the labor force. The Ethiopian government has a long history of offering incentives. The incentives come in various shapes and forms, ranging from fiscal and customs incentives that provide direct and indirect tax holidays to financial incentives that facilitate access to foreign exchange and credit. It is, therefore, essential to study what aspect of these incentives need to be modified to increase their impact on job growth.

[1] Ministry of Labor and Skills (JCC), Basic Employment Statistics, Accessed on March 10, 10:33 AM.

Most of the fiscal and customs incentives are stipulated in the investment proclamations, and this could have a couple of unintended consequences. First, as Gebrewolde and Rockey (2019) found, investors may skew their investments towards unproductive investments (like buildings). This will mean that most of the stated objectives of the investment proclamations and the benefits that are expected to accrue will not be realized. Second, even when investors invest in productive capital (machineries), it is possible that they may substitute labor for capital, depending on the elasticity of substitution between capital and labor. In such instances, the buildup of capital (productive and unproductive) may not be associated with the employment growth the Ethiopian government desires to achieve. As such, the incentives the government provides must be made more specific and targeted so that the outcomes match the objectives.

This study attempted to quantify the incentives that have been offered, examine their effect on employment growth, and understand why they have not been able to spur employment growth. For this purpose, it used a novel administrative data obtained from the Ethiopian Customs Commission and a rich survey data that covers the universe of large and medium manufacturing enterprises in Ethiopia - the Large and Medium Scale Manufacturing (LMSM) survey. The administrative dataset has information on taxes firms paid after receiving incentives and the statutory full tax obligation without incentives. The data reveal that some sectors (like educational support equipment) enjoy significant benefits, up to 100% tax reductions, while others (like tobacco production) pay most of their tax obligations.

The econometric analysis that used the LMSM survey showed that firms that hire more workers operate in an environment with significant costs. Establishments that hire more workers pay higher taxes, incur a significant raw material costs and utilities, and pay higher transportation and logistics costs. Firms that employ more workers also pay higher cost of finance (the sum of interest payment on debt, insurance premiums, amortization, and bank charges). These costs could hinder productivity growth and expansion of employment opportunities. In fact, these points were stressed by GTP-II which emphasized higher costs as the reason behind and the consequence of the low performance of large and medium manufacturing industries in export revenue generation and the creation of job opportunities.

Aggregating the administrative data at the subsector level, we created our incentive measure based on the ratio of actual taxes paid (including incentives) to statutory tax obligation (with no incentives). This measure of incentives was then included in the regression analysis to estimate the elasticity of employment with respect to incentives. The elasticity has the expected sign (positive) but was insignificant. Despite their cost, the incentives have not yet born the desired result. We then interacted the incentive variable with cost of raw materials and the cost of finance. Both have the expected signs (negatives), although they are not statistically significant. As the cost of raw materials and finance increase, the elasticity of employment with respect to incentives decreases.

The review of the incentives and the results from the empirical analysis indicate that the Ethiopian government needs to clearly articulate the incentive packages. In particular, if the goal is to create ample job opportunities for the young and growing labor force, the government needs to monitor and follow up incentive-receiving firms and engage in periodic assessments as to whether the desired objectives (be it export promotion or employment creation) are on course to be met. These incentives are costly. Gebrewolde and Rockey (2021) shows that tax revenue forgone due to the incentives is about 0.5% of GDP or 5% of annual government spending. Hence, a serious monitoring and evaluation will provide the foundations for a more targeted and effective incentive package.

The rest of this paper is organized as follows. Section 2 discussion the labor market in Ethiopia and the policy attention high unemployment rate received. Section 3 reviews the investment proclamations that provide the platform for fiscal, customs and financial incentives. Section 4 uses novel administrative data to describe the size and scope tax incentives in Ethiopia. Sections 5 and 6 conducts econometric analysis using administrative and survey data to identify factors that are significantly associated with employment growth and explain whether these factors have decreased the employment elasticity of fiscal incentives. Section 7 provides a brief guidance as to how to increase the impact of incentives. Section 8 provides concluding remarks and policy recommendations.

2. Unemployment and Government Responses in Ethiopia

Like many other developing countries, the labor market in Ethiopia has features that make it distinct from labor market in advanced countries. As these features affect the reported unemployment rates in developing countries, they need to be taken into account when reading employment and unemployment statistics. One key difference relates to the definition of the unemployment rate. According to the standard definition, unemployment rate is computed based on the number of people that are unemployed but are available and actively looking for work.[2] Unemployed people that are not actively looking for work are considered discouraged workers and the do not feature in the unemployment rate. In advanced countries, there are several ways to verify that unemployed people are looking for jobs. For instance, in the United States, unemployed people receiving unemployment benefits are required to apply for jobs. Since it is not easy to determine whether an unemployed individual is looking for work in Ethiopia, primarily because of the lack of comprehensive and consolidated labor market information in Ethiopia, unemployed workers are defined as "people without work but available for work," regardless of whether they are looking for work or not. This "relaxed" definition is the definition adopted by the Central Statistics Agency of Ethiopia in the National Labor Force Surveys.

Ethiopia also has a large self-employed population, and this level of self-employment is high even conditional on the level of per capita GDP (Poschke, 2018). In 2021, 54.4% and 36% of the employed Ethiopians are self-employed and unpaid family workers respectively (LMS, 2021). Thus, wage employment is roughly only about 10% of the total employment. People with who lose wage employment could report that they are self-employed or unpaid family workers. Consequently, the reported unemployment rates are likely to be downward bias by a large margin.

Against this backdrop, unemployment appears to be a more serious issue for urban Ethiopia than rural Ethiopia. In 2021, at the national level, the unemployment rate was 8%. In rural and urban

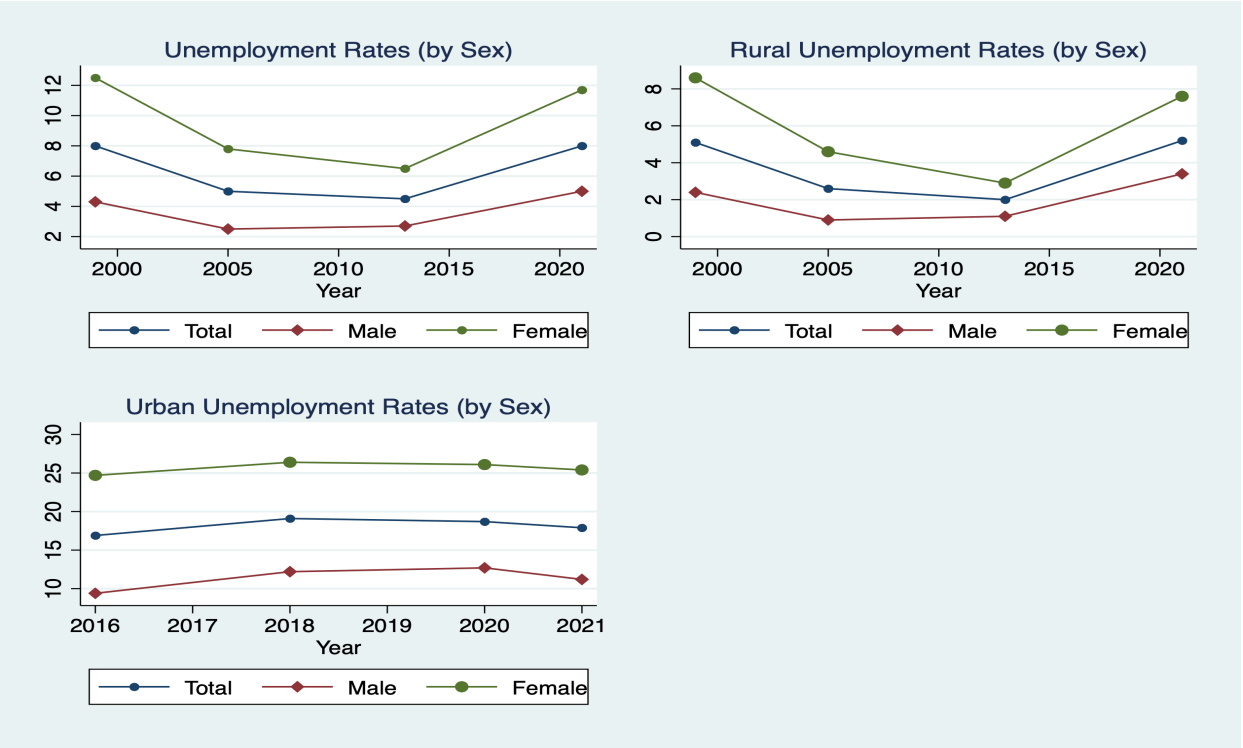
[2] This textbook definition comes from International Labor Organization. A detailed discussion of the definition could be found here.

areas, the unemployment rate was 5.2% and 17.9%, respectively. This feature of labor markets is not unique to Ethiopia. In many developing countries, urban unemployment is higher than rural unemployment. This issue, of course, has likely been exacerbated by rural to urban migrations. Throughout the country, the unemployment rate for women is much higher than that of men.

The latest Labor and Migration Survey (LMS, 2021) reveals many interesting developments in the labor market that deserve the attention of policymakers. To mention a few:

- The labor force participation rate is showed a substantial drop from its previous values. In 2021, the participation rate was 64.7%, compared to 80.7% and 79.8% in 2005 and 2013, respectively.
- The employment to population ratio also sharply dropped. It was 59.5% in 2021 while it was 76.6% and 76.2% in 2005 and 2013, respectively.
- Agriculture still employs the bulk of the rural population (77.3% in 2021) while the service sector employs the majority of the urban workforce (73.4% in 2021). Nationally, while the share of employment in agriculture is still very high (64.9% in 2021), this share has been on a downward trend. The service sector seems to have fully absorbed the workers released by the agriculture sector. The share of employment in manufacturing has been remarkably stagnant for the past two decades (See Figure A.1 in Appendix 2).
- Youth unemployment at the national level is much higher than the overall unemployment rate. 23% of the population aged 15 to 29 were unemployed. (28.8% for women and 15.9% for men)
- The latest LMS also shows that the unemployment rate of literates is higher than that of illiterates. Of the unemployed people, 35% have attended primary education while 33% are illiterates (do not know how to read and write).

Figure 1: Unemployment Rates. Source: National Labor Force Surveys



Source: LMS (2021)

In light of this issue, the government of Ethiopia has taken policy measures to make enable the creation of adequate employment opportunities to Ethiopians that are willing to work but do not have jobs. Most of these measures come in the form of incentives for domestic and foreign direct investment, and they often comprise fiscal, customs and financial elements. We will review the specific incentives in Section 3 of these document.

Addressing the rampant unemployment, especially urban unemployment, has been a major component of the growth and development plans of the government of Ethiopia. The first Growth and Transformation Plan (GTP-I) emphasized on micro and small enterprises as the source of employment and entrepreneurship and designed strategies to remove the bottlenecks that inhibited such enterprises. GTP-I stressed the need to improve the performance of the large and medium scale manufacturing (LMSM). LMSM were targeted the generation of 1.82 billion USD in exports from LMSM. Nevertheless, at the end of GTP-I's planning period, 2014/15, the export revenue generated from LMSM stood at 409 million USD, a mere 22.5%.[3] GTP-I also failed

[3] GTPII, p. 29

to achieve the employment creating target it set out to achieve. The plan identified poor infrastructure, low productivity and competitiveness, low quality of domestic inputs, issues with transportation and logistics facilities, lack of reliable source of energy and financial services.[4]

Much like GTP-I, GTP-II had acknowledged unemployment as a major policy challenge of Ethiopia. GTP II stated "the government has remained committed to sustaining inclusive and pro-poor development strategy during the coming years to further scale up the poverty reduction and employment generation effort."[5] In line with this commitment, it planned to decrease the national unemployment rate from 4.1% in 2014/15 to 3.5% in 2019/20. However, the unemployment rate went awry and spiked to 8% in 2021.[6]

The ten-year development plan (2021-2030) identifies the rise in unemployment as one of the development challenges of the growth and transformation plans. The Home-Grown Economic Reform also aspires to create a stable macroeconomic environment which creates enough employment opportunities and ensure all segments of the society benefit from growth and development achievements.

3. Institutional Setup

The government of Ethiopia has passed several investment proclamations and amendments to "improve the living standards of the peoples of Ethiopia through the realization of sustainable economic and social development."[7] These proclamations identify several channels through which this major objective would be realized. These channels include developing natural recourses, increasing exports and export earnings, increasing the role of the private sector in investment, attracting foreign investors, and so on. By increasing economic activity, it is believed,

[4] IBID, p.30
[5] GTP II, p.8
[6] A major global pandemic, COVID-19, which could not have been seen in 2015 played a big role in the rise in unemployment rate. Nevertheless, the unemployment rate was already high even before the pandemic struck. GTP-II had planned to decrease urban unemployment rate to 12.2% by 2019/20. The actual urban unemployment rate in 2020 was 18.7%. (IOM, 2021)
[7] Ethiopian Investment Proclamation No. 769/2012

the incentives contained in these proclamations will encourage firms to create employment opportunities for Ethiopia's young population.

These incentives have generally taken three forms: fiscal incentives, customs incentives, and financial incentives. These incentives were stipulated in Investment Proclamation No. 769/2012 and Investment Regulation No. 270/2012 and have recently modified in 2020 as Investment Proclamation 1180/2020 and Regulation 474/2020.[8] (More on these proclamations in Section 3.2 and 3.3) In addition to the income tax and customs incentives, financial incentives were offered through the Development Bank of Ethiopia (DBE).

3.1. Historical Context

The Provisional Government of Ethiopia issued the first investment proclamation on May 25, 1992 with the aim of creating a conducive environment for private investment: Proclamation No. 15/1992. Investments in manufacturing and agriculture were eligible for investment incentives under this proclamation. The incentives package included 100% exemption from customs duties on imports of capital goods and income tax exemption (tax holidays) ranging from 1 to 8 years conditional on the type and location of the investment.

Four years later, the proclamation was replaced by Proclamation No. 37/1996 in June 1996. The new proclamation included investments in education, health, tourism, and construction sectors to be eligible for incentives. This proclamation opened the real estate sector and electricity and water supply to foreign investors, extended the loss-carry forward provision, and reduced the capital gains tax from 40% to 10%.

Proclamation No. 37/1996 was then replaced by proclamation No.116/1998 in June 1998. The most important change in the latest proclamation was the opening of defence and telecommunication sectors for joint private-government investments. Prior to this proclamation, these sectors were set aside solely for the government. The investment proclamation would then be revised again in July 2002 (Proclamation No. 280/2002) and in September 2012 (Proclamation

[8] The proclamations and the regulations may be found on the Ethiopian Investment Commission's website here.

No. 769/2012). These proclamations opened most of the economy for foreign investors with the exception of a handful of sectors.[9]

3.2. Investment Proclamation No. 769/2012 and Investment Regulation No. 270/2012

The proclamation and regulation passed in 2012 provided comprehensive incentives for new investment as well as the upgrading of operating establishments. Theses incentives include a guarantee for repatriation of capital by foreign investors, duty free importation of capital goods and vehicles, tax holidays lasting up to eight years, opening, and operating foreign currency accounts, owning immovable property for the purpose of investment, loss carry forward, duty drawback scheme and voucher scheme. More importantly, the incentive packages had significant fiscal and custom elements (duty exemptions and income tax exemptions).

The main fiscal incentive offered is an income tax exemption. The profile of income tax exemptions for new enterprises and existing ones, attached to the investment regulation as an attachment, provides a detailed breakdown of the income tax exemptions offered to investments in manufacturing, agriculture, information and communication technology, electricity generation, transmission, and distribution. The income tax exemptions range from 1 year to 8 years depending on whether the investment is in pre-designated priority sectors and locations. Investments in pre-specified regions that are further away from Addis Ababa and the special Oromia zone surrounding Addis Ababa are offered longer period of income tax exemptions.

It also provides the list of investments that are eligible for duty-free imports capital goods and construction materials that are necessary for the establishment of new enterprise or expansion of existing ones. Exemptions pertaining to the import of motor vehicles and the transfer of goods imported using the duty-free provision are outlined.

[9] The sectors that are not open to foreign investors are banking, insurance, and microcredit services, forwarding and shipping services, broadcasting services, and air transport services using aircraft with seating capacity over 20 passengers.

The incentives were believed to spur balanced investment throughout the country and transform the economy. This would then lead to more employment opportunities, higher foreign exchange, a strong private sector, increased foreign direct investment, and accelerated economic development.

3.3. Investment Proclamation No. 1180/2020 and Regulation No. 474/2020

While the jurisdiction and objectives of the 2020 investment proclamation were similar to the 2012 proclamation, the new proclamation has new features as well. First, the 2020 proclamation and regulation do not list out income tax incentives by sectors and subsectors. This means the income tax incentives stipulated in Regulation 270/2012 remain in effect until modified by another investment regulation. Second, it also does not explicitly list sectors that are open to foreign investors. It specifies the sectors that are reserved for domestic investors and joint domestic-foreign investors and leaves the rest as permissible to foreign investors. The new proclamation also removed sectors that were reserved for government monopoly. Moreover, restrictions on investment for foreigners in some sectors were lifted with the aim of attracting more investment. These sectors include cement manufacturing, information technology, tourism, education, and health except small and medium level services. Restrictions in transport services for foreign investment in such areas as railway transport, cable car transport, cold-chain transport and freight transport have also been removed.

The new investment proclamation abolished the distinction between Ethiopian nationals and foreign nationals of Ethiopian origin, removing sectors that were exclusively reserved for Ethiopian nationals. This is consistent with the amendments made to sector specific laws such as the banking business proclamation and the insurance business proclamation. Consequently, foreign nationals of Ethiopian origin are now eligible to invest in banking, insurance and micro-credit services, Packaging, forwarding, and shipping agency services, media services, attorney and legal consultancy services, preparation of indigenous traditional medicines, advertisement, promotion, and translation works and domestic air transport services.

3.4. Financial Incentives

In addition to the fiscal incentives (which are mainly business income tax exemptions) and customs exemptions (which are mainly VAT, excise tax, withholding tax and surtax exemptions), the Ethiopian government has also offered financial incentives. These incentives include subsidized loans from the Development Bank of Ethiopia, access to foreign loans, priority access for foreign exchange, franco valuta import of capital goods and raw materials, cost sharing arrangement for training local and expatriate personnel, lease financing and so on. Some of these incentives predate the recent proclamations which provide the fiscal and customs incentives.

4. Quantifying Tax Incentives

Data on the magnitude of tax incentives is not readily available and easily obtainable. In ideal scenario, data on income taxes incentives (labor income tax, profit tax, and so on) would come from Ministry of Revenue, data on customs duty exemptions would come from Customs commission, and data on financial incentives would come primarily from the Development Bank of Ethiopia. Since the LMSM survey consists of the universe of large and medium scale manufacturing in Ethiopia, the incentives data would be merged with the survey data to quantitatively examine whether the incentives have had the desired effect. Obtaining these data from the different government ministries requires a long time and a painstaking work.

While we did not have the time and the resources to undertake such a task, we managed to obtain data on several types of taxes and the corresponding statutory obligations from the Customs Commission.[10] This dataset has information on the Value Added Tax (VAT), excise tax, withholding tax, and surtax for 4,466 firm-year combinations over the period 2011-2020.[11] For all these tax variables, information is available regarding the actual tax firms paid and what they would have paid under the statutory obligation. Since this dataset did not have an establishment level ID, it was not possible to merge the customs data with the survey data. Thus, we had to

[10] I am extremely grateful to Temesgen Wajebo for obtaining sharing this data with me.

[11] 4,466 is the total number of observations in the unbalanced panel data. Since we only have information of the subgroup the firms operate in, and not the firms' names or a unique ID, it is not possible to know the total number of unique firms in the dataset.

aggregate the customs data at the three-digit International Standard Industrial Classification (ISIC) level and use the ISIC classification to merge the customs data with the survey data aggregated at level of three-digit ISIC classification.

Figure 2 below plots one minus the ratio of actual taxes paid to total taxes due for the period 2015-2018. That is, for each industry sub-group in the graph, we compute

$$incentive = 1 - \frac{Taxes\ Paid}{Taxes\ Due}$$

If firms paid the total tax due in full, the value of this ratio will be 0. Thus, higher values indicate lower actual tax payment and higher incentive.

This, of course, this is a highly imperfect measure of incentives offered. Actual tax payment could be lower than the statutory obligation due to, say, tax non-compliance. In that sense, the ratio could measure the weaknesses of the tax administration system. Note, however, equipped with this information, the government of Ethiopia will not allow firms to systematically non-comply. Legal actions will be taken against firms that underpay their tax obligation. Hence, we do not anticipate tax non-compliance to the primary reason why firms pay lower taxes than they should. We believe incentives are part of this discrepancy.

Having such caveats in mind, we will use this data to get a sense of the magnitude of incentives offered to formally set up establishments by the Ethiopian government. Data with a higher quality to estimate the magnitude of the incentives would be of paramount importance to research as well as policy.

From Figure 2, we see that firms in the dataset enjoyed significant amounts of tax incentives. The incentives range from about 7% of total tax obligation to almost 100% of the total tax obligations.[12] Figure A.2 in Appendix II plots the top 10 and bottom 10 incentive recipient subsectors. As is evident from the figure, some of the sectors that enjoyed the highest incentives paid 0% of their tax obligations. Classifications that enjoyed such incentives include fertilizer

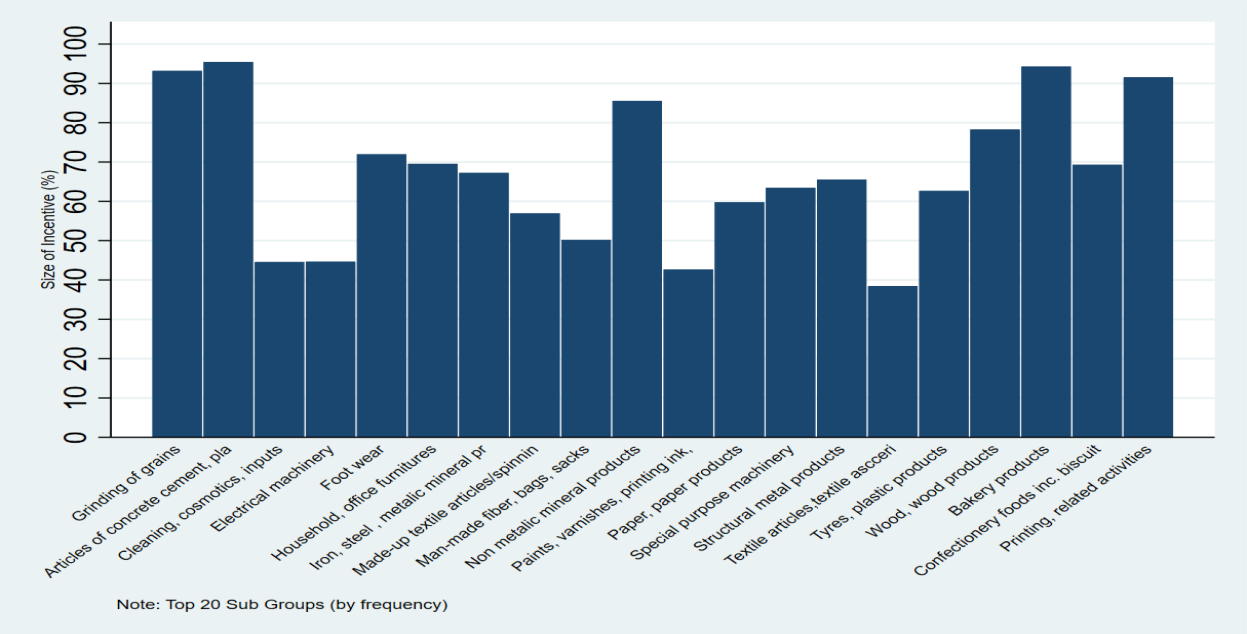
[12] A firm that pays 10% of its tax obligation is interpreted as receiving 90% of its obligation as incentives.

producer, manufacturers of educational support equipment, bakery products, mineral refiners and processors, and so on.

Even among the sectors that ranked in the bottom 20 classification (based on the amount of incentives received), the average incentive is quite high. Classifications like medical chemicals, machineries, pharmaceuticals, and so on received sizable incentives. The lowest incentives went to manufacturers of carpets, rugs, and mats, and tobacco.

Overall, notwithstanding the different objectives, the Ethiopian government appears to be providing significant incentives to firms. The incentive we tried to quantify in this section is only indirect tax incentive. We have noted that some sectors are completely exempt from tax incentives, while many classifications receive the reduction in the majority of their taxo obligations as incentives. While a more complete data that has direct income tax incentives and financial incentives is needed to portray a good picture of incentives provided by the Ethiopian government, this section has shown that there are substantial incentives that deserve a carefully planned impact evaluation. However, this study will fall short of that due to data limitations.

Figure 2: The ratio of actual tax payments to statutory obligations



Source: Author's Computations, Data from Customs Commission. The classes represent the top 20 subgroups by the frequency of firms in the data.

5. Econometric Analysis of Incentives and Employment

5.1. Data and Descriptive Statistics

This study exploits two rich data sources to examine the effect incentives given to formal establishments have had on job creation in Ethiopia. First, we use the Large and Medium Scale Manufacturing (LMSM) survey collected by the Central Statistical Agency (CSA) of Ethiopia. The LMSM contains annual data on the universe of medium and large-scale firms in Ethiopia from 1996 to 2020.[13] As the survey covers the universe of medium and large firms, it is unbalanced panel data. The survey covers from the basic characteristics of the firms (age of establishment, paid-up capital, ownership type, wage bills, etc) to a detailed breakdown of the costs and outputs of these firms.

The second dataset we use comes from Ethiopian Customs Commission. These data include information on the statutory tax obligation as well as the tax they actually pay. The customs data covers excise tax, withholding tax, sur tax, value added tax (VAT) over the period from 2011 to 2020. We interpret the difference between the actual tax paid and the statutory tax obligation as "tax incentives".

Since the two data sources do not have a common establishment identifier, the analysis that exploits the customs data aggregated the data at three-digit industrial classification (ISIC) level, while the analysis that used the LMSM survey was at the establishment level. Basic summary statistics are provided in Appendix I.

5.2. Conceptual Framework

The quantitative analysis for this exercise proceeds in two steps. In the first step, we identify the factors that are significantly associated with firm-level labor demand. Since firms operate in an environment where they face several binding constraints, incentives given to stimulate employment and production may appear ineffective if other constraints prevent firms exploiting the incentives to increase employment and produce more. So, this step of the empirical exercise

[13] Definition of Large and Medium Scale Manufacturing: Employed 10 persons or more; used powered machine,

will help us identify the factors that are significantly associated with firm-level employment growth. This step will use establishment level data from LMSM.

The second step of the analysis will use data aggregated at the sub-sector level – the incentive data from Customs Commission and all other characteristics of establishments from LMSM survey. Since the customs data provides a natural measure of incentives provided by the Ethiopian government, the incentive measure we constructed in Section 4 will be used as a regressor in the employment regressions, on its own and as an interaction term with other firm-characteristics. This will help us measure the association between the tax incentives and employment creation *conditional* on factors that are significantly associated with employment.

5.3. Model Specification

As discussed in Section 5.2 above, the empirical analysis will employ two steps. In the first step, we will estimate employment equations using establishment-level LMSM survey data. In this step, we will estimate the following equation

$$employemnt_{it} = \beta_0 + \beta_1 wage_{it} + \beta_2 taxes_{it} + \beta_3 capital_{it} + \beta_4 age_{it} + \mathrm{B}X_{it} + \alpha_i + u_{it} \ldots (1)$$

i denotes establishments and t denotes time (2012-2018). $employemnt_{it}$ is the number of employees at establishment; $wage_{it}$ is the average wage for the establishment; $taxes_{it}$is the sum of value-added tax, excise tax, and profit income tax; $capital_{it}$ is current paid-up capital; age_{it} is the age of the establishment; X_{it} is a vector of controls related to the costs of the establishment, the ownership of the establishment, and the legal form of the establishment.

The second step of the analysis will exploit aggregated, subsector-level panel data to estimate a similar equation, but now augmented with the tax incentives measure and interaction terms. To demonstrate the point this study is making, the incentive measure and its interactions with the cost of raw materials and financial services are added to the regressions. The coefficient on the interaction terms will tell inform us about the negative effect the costs of raw materials and financial services exert on the employment effects of tax incentives. That is, we estimate,

$$employemnt_{it} = \beta_0 + \beta_1 incentives_{it} + \beta_2 wage_{it} + \beta_3 taxes_{it} + \beta_4 capital_{it} + \beta_5 age_{it} + \beta_6 costs_{it} + \beta_7 incentives \times costs_{it} + \mathrm{B}X_{it} + \alpha_i + u_{it} \quad \ldots\ldots\ldots\ldots\ldots\ldots (2)$$

In this regression, i denotes subsectors and t denotes years (2012-2020). All variables are as defined before. We interact the total cost of raw materials and the cost of financial services with our incentive measure. The main focus of this analysis will be the coefficients on the interaction term, β_7. (Each interaction term will be created by multiplying tax incentive with the significant determinants of employment.) These coefficients will tell us the effect of incentives on employment conditional on the determinants of employment identified in the first step of this analysis.

Estimating the two equations specified suffers from a well-known econometric problem. Since employment and wages are determined by the equilibrium demand and supply, OLS or even fixed effects on the above equations suffers from simultaneous equation bias. Thus, the coefficient we obtain capture association, not necessarily causation.

We do not attempt to rectify this endogeneity problem in this study. Instead, we identify factors that are significantly associated with employment from the first regression and check whether the costs of raw materials and financial services have subdued the effect of incentive on employment in the second regression.

6. Results and Discussion

6.1. Establishment-Level Analysis

Results from the estimation of Equation (1) are presented in Table 1 below.[14] While we present the results from pooled OLS, fixed effects and random effects estimations for comparison purposes, the analysis draws its conclusions from the fixed effects regression.

[14] The regression table with all the explanatory variables is presented in Appendix III. The table presented here zooms in on the variables the analysis focuses on.

A percentage point increase in average wages is associated with 0.123% fewer employees on average. This is not unexpected since the regression we are estimating is essentially a labor demand function. Establishments that pay higher taxes also tend to be the establishments that employ more workers. This too is expected. Larger firms employ more workers and pay more taxes. Paid-up capital is not significant in the fixed effects regression but has the expected sign. Given that the establishments in Ethiopia are not high on the complexity ladder, both in terms of technologies adopted and value added, appear to complement each other. Firms that were established long ago tend to higher more, although the effect of age of establishment on age wanes over time. An increase in age of establishment by 1 year is associated with 0.56% increase in the total number of employees.

Table 1: Establishment Level Regression (Dependent Variable: Number of Employees in Logs)

VARIABLES	**Pooled OLS**	**Fixed Effects**	**Random Effects**
Average Wage (log)	-0.151***	-0.123***	-0.135***
	(0.00842)	(0.0120)	(0.00801)
Total Tax (log)	0.0140***	0.0120***	0.0160***
	(0.00201)	(0.00260)	(0.00186)
Current Paid-up Capital (log)	0.0431***	0.00404	0.0338***
	(0.00336)	(0.00420)	(0.00306)
Age of Establishment	0.00963***	0.00555***	0.00964***
	(0.000727)	(0.00165)	(0.000804)
Costs			
Raw Materials (log)	0.0806***	0.0457***	0.0757***
	(0.00400)	(0.00601)	(0.00385)
Imported Raw Mat (log)	0.00733***	0.00258	0.00683***
	(0.00122)	(0.00165)	(0.00115)
Fuel (log)	0.0179***	0.00743***	0.0145***
	(0.00166)	(0.00218)	(0.00155)
Utility (log)	0.0221***	0.00701*	0.0190***
	(0.00289)	(0.00395)	(0.00272)
License Fee (log)	0.000490***	0.000132	0.000346***
	(7.06e-05)	(8.36e-05)	(6.30e-05)
Transportation (log)	0.00686***	0.00413*	0.00815***
	(0.00191)	(0.00246)	(0.00177)
Financial Services (log)	0.0391***	0.0171***	0.0375***
	(0.00224)	(0.00323)	(0.00215)
Rent Payable (log)	0.0166***	0.0107***	0.0156***
	(0.00155)	(0.00227)	(0.00151)

Constant	1.154***	2.779***	1.277***
	(0.0824)	(0.139)	(0.0806)
Observations	8,074	8,074	8,074
R-squared	0.659	0.179	
Number of Establishments		5,560	5,560

Standard errors in parentheses; *** p<0.01, ** p<0.05, * p<0.1; Note: Total tax is the sum of value added tax, excise tax, and tax on profit; utility Cost is the cost of electricity and water; Professional services fee is the cost of accounting services, legal services, etc.; Cost of financial services includes interest payment, amortization costs, bank charges, and insurance premium. Hasuman for comparison of fixed-effects and random-effects strongly rejects random-effects with a p-value of 0.0000

Establishments that pay more for raw materials tend to be the ones that hire more workers. A percentage more cost is associated with 0.05% increase in employment. The cost of fuel tends to be associated with higher employment – the firms that incur higher fuel costs are the same firms that employ more workers. The same goes with the cost of utilities and the cost of transportation. Firms that have more employees also tend to pay higher financial costs. A percentage point increase in our measure of the cost of finance, the sum of interest payment on debt, insurance premiums, amortization, and bank charges, is associated with 0.017% increase in employment, all else equal. Larger firms, in terms of the number of workers they hire, also tend to pay higher rent.

High production costs, poor infrastructure and logistics, and lack of access to basic affordable financial services could offset any potential employment benefit incentives could bring. In fact, this point was recognized by GTP-II. GTP-II discussed the reasons behind the low performance of large and medium manufacturing industries during GTP-I: (1) In terms of export earning, only 22.5% of the set target in GTP-I was achieved, (2) The creation of job opportunities was significantly lower than anticipated.[15] One of the reasons for low performance of the LMSM industries was low level of productivity and competitiveness. The plan states,

> "*The low level of quality and productivity of as well as competitive capacity of existing domestic firms in global markets is attributed to inefficient technology use, lack of competitive, reliable, and quality domestic input (raw materials) supply, problems related*

[15] GTP-II, p. 29.

to logistics of both import and export, high cost of transport, logistics, challenges related to reliable supply of electricity, and financial services." (GTP-II, p.30)

The finds of the regression analysis go hand-in-hand with this assessment of GTP-II. This result, while not surprising, has serious policy implications. Creating conducive environment where businesses flourish and create ample employment opportunities should be the primary focus of the government. Perhaps, considering the redirection of resources that are spent on incentives towards doing the groundwork for investment may be the right approach to follow.

6.2. Subsector-Level Analysis

Results from the estimation of Equation (2) are presented in Table 2.[16] Aggregated at the subsector level, the results we obtained from the establishment level remain. Establishments that employ more workers tend to pay higher taxes, have higher paid-up capital, tend to be older, and so on.

This table presents two additional points to the analysis. First, we see that the incentives variable has the expected sign. The firms that receive more in incentives are the same firms that employ more workers. However, the relationship is not significant at all levels of significance. The same result has been obtained by other studies. For example, using the same survey data, Gebrewolde and Rockey (2019) found that incentives given in the Sustainable Development and Poverty Reduction Program (SDPRP) had negative effect on productivity while it did not increase employment. Gebrewolde and Rockey (2019) show that the incentives led to increases in unproductive assets such as buildings and not productive assets like machinery.

Moreover, as we highlighted in our review of the investment proclamations and regulations, the current incentives come with multifold objectives, and they are not necessarily complementary. For instance, a firm that substitutes labor with capital to produce exportable items will be a success on one of the objectives (export promotion) but failure on the other (employment creation). A shift from labor towards productive capital may, of course, not constitute a failure

[16] The regression table with all the explanatory variables is presented in Appendix IV. The table presented here zooms in on the variables the analysis focuses on.

when one considers the general equilibrium effects of such substitution. It certainly is a better alignment with the policy than, say, a shift towards unproductive capital, a la Gebrewolde and Rockey (2019). Nevertheless, it would mean that the costly incentives need to have a clear and measurable objective if they are to succeed.

The second interesting result we found from the subsector analysis is that even the limited effect incentives have on employment is subdued by high input costs as GTP-II indicated. The interaction terms involving the incentive and two types of costs (the cost of raw materials and financial costs) turned out to be negative. These interaction terms are mostly insignificant, except the interaction term between incentives and financial services which is significant at 10%. However, the do have the expected sign.

Table 2: Subsector Level Regression (Dependent Variable: Number of Employees in Logs)

VARIABLES	**Total Raw Materials (OLS)**	**Financial Services (OLS)**	**Total Raw Materials (Fixed Effects)**	**Financial Services (Fixed Effects)**
Incentive	0.143	0.150	0.0154	0.0310
	(0.149)	(0.149)	(0.133)	(0.133)
Average Wage (log)	-0.260***	-0.258***	-0.0770	-0.0732
	(0.0473)	(0.0473)	(0.0472)	(0.0472)
Total Tox (log)	0.0183*	0.0181*	0.0107	0.0110
	(0.00952)	(0.00956)	(0.00902)	(0.00901)
Current Paid-up Capital (log)	0.233***	0.232***	0.210***	0.210***
	(0.0178)	(0.0178)	(0.0199)	(0.0199)
Age of Establishment	0.0207***	0.0208***	0.0211***	0.0207***
	(0.00321)	(0.00322)	(0.00388)	(0.00388)
Costs				
Raw Materials (log)	0.183***	0.184***	0.143***	0.145***
	(0.0191)	(0.0192)	(0.0180)	(0.0178)
Financial Services	-0.0160	-0.0152	0.00906	0.00859
	(0.0131)	(0.0131)	(0.0116)	(0.0116)
Interaction Terms				
Incentive X Raw Material	-0.0435		-0.0589	
	(0.0509)		(0.0487)	
Incentive X Financial Services		-0.00725		-0.0411*
		(0.0260)		(0.0231)
Constant	-1.058**	-1.097**	-1.270**	-1.351***
	(0.458)	(0.456)	(0.497)	(0.494)

Observations	646	646	646	646
R-squared	0.866	0.866	0.585	0.586
Subsectors			123	123

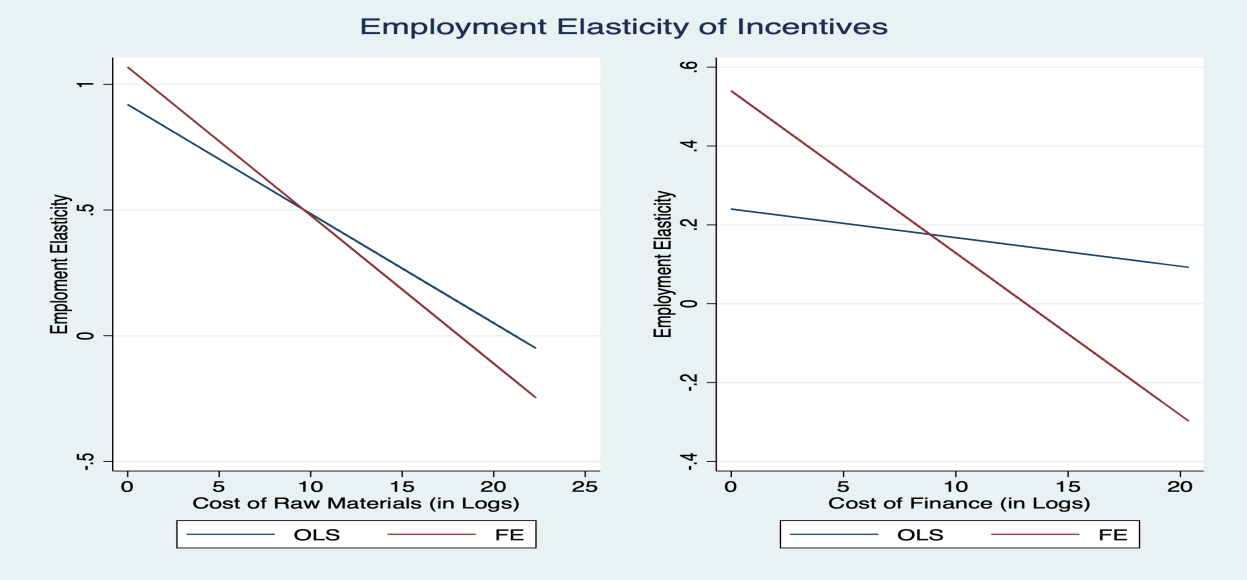
Notes: Standard errors in parentheses; *** p<0.01, ** p<0.05, * p<0.1; Total tax is the sum of value added tax, excise tax, and tax on profit; utility Cost is the cost of electricity and water; Professional services fee is the cost of accounting services, legal services, etc.; Cost of financial services includes interest payment, amortization costs, bank charges, and insurance premium. Hasuman for comparison of fixed-effects and random-effects strongly rejects random-effects with a p-value of 0.0000

Figure 3 plots the effect of raw material costs and finance costs on the elasticity of employment with respect to incentives. That is, the figure plots

$$\frac{d\log(employment)}{d\log(incentives)} = \beta_1 + \beta_7(x - \bar{x})$$

where β_1 and β_7 are the coefficients of the incentive measure and the interaction term. $x - \bar{x}$ is the deviation of either the cost of raw materials or financing costs from the respective mean. As can be seen from the figure, higher cost of raw materials or higher cost of finance is associated with lower employment elasticity. Consequently, policies that aim to boost employment will only be effective if they are complemented with policies that improve the business environment, facilitate affordable production raw materials, and seek to provide a cheaper source of finance.

Figure 3: The effect of raw material and finance costs on the employment returns of incentives



Source: Author's computations

7. Conclusions and Policy Recommendations

Owing to the high unemployment rate in Ethiopia, the high growth rates recorded in the 2000s and 2010s did not translate into improvement in living standards of most Ethiopians. As a result, unemployment has gained increasing attention for policymakers in Ethiopia. This attention has been reflected in GTP-I, GTP-II, the homegrown economic reform agenda, and the ten-year development plan. At 8% nationally and 17.9% in urban areas, unemployment remains a pressing policy challenge.

This study attempted to quantify the incentives that have been offered, examine their effect on employment growth, and understand why they have not been able to spur employment growth. The analysis showed that firms that hire more workers operate in an environment with significant costs and poor utilities and logistics infrastructure. Establishments that hire more workers pay higher taxes, incur a significant raw material costs and utilities, and pay higher transportation and logistics costs. Firms that employ more workers also pay higher cost of finance. The analysis also showed that the elasticity of employment with respect to incentives is a function of the costs of raw material and finance. Higher costs of raw materials and finances diminish the effect of incentives on employment.

The study yields the following policy recommendations.

1. The investment incentives have multiple objectives and creating ample employment opportunities is just one. This being the case, it is difficult to measure effectiveness of these incentives only on one metric. Incentives that are specifically designed to improve employment conditions need to be articulated better.
2. The analyses revealed that the costs of raw materials and services, the cost of finance, and poor infrastructure might reverse the effect of incentives on jobs. Hence, the government should complement existing incentives plans to make the business environment more conducive for private investment. This need not involve significant financial outlays. Cutting down bureaucracies, license fee reductions and waivers, and so on are a good starting point.

3. The incentives offered need to be periodically assessed. Some of the incentives might be channeled towards stocking up investments that will not lead to increases in employment or foreign exchange revenues. Rewarding firms that are thriving with better incentive packages and eliminating incentives from firms that are abusing them could help improve the effectiveness of the incentives with no significant additional fiscal outlays.
4. Obtaining data on the magnitude of this incentives is almost impossible. This study made use of one such data that obtained from the Customs Commission. The Investment Commission and the Job Creation Commission should create and maintain a database on fiscal, customs and financial incentives. The data on these incentives are mainly found at the Ministry of Revenue, the Ethiopian Customs Commission, and the Development Bank of Ethiopia. Regularly collecting these data is necessary to target the incentives better.
5. This study has shown that the cost of utilities is significantly associated with employment growth. These factors have been identified as challenges for production and expansion of manufacturing industries.[17] Transportation and logistics challenges are also a significant obstacle to firm, and hence, employment growth. The government needs to increase its efforts to provide reliable infrastructure.
6. Ethiopia ranks law on World Bank's ease of doing business rank. In 2020, it ranked 159th out of 190 countries. Such performances not only reflect the challenges faced by business that are operating, but also disincentivize possible foreign investors from bringing a much-needed inflow of capital. The Ethiopian government should learn from African countries like Rwanda, Kenya and Mauritius improve the business environment to attract foreign direct investment.

[17] See, for instance, the report by Job Creation Commission, "State of Jobs, 2019".

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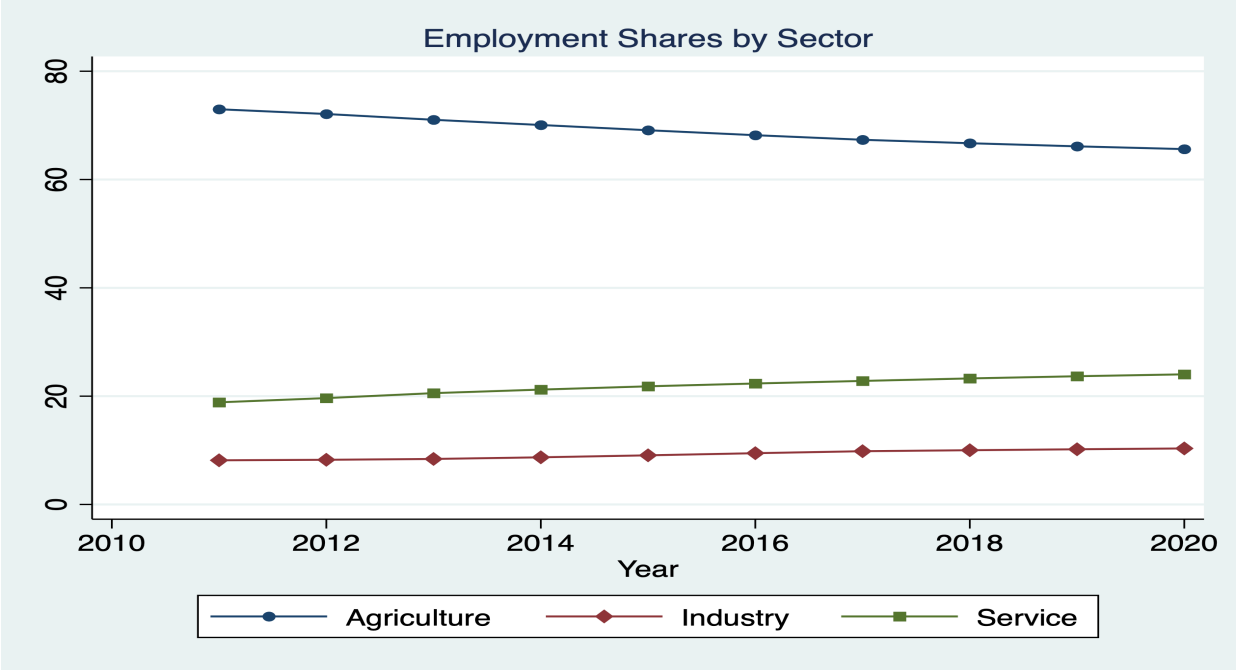
A**ppendix 1: Basic Summary Statistics**

Variable	Obs	Mean	Std. Dev.	Min	Max
# of Employees (June)	16104	65.299	122.548	1	997
Total Wages	16104	1845458.5	5269534.3	1	1.230e+08
Average Wage	16104	19048.524	18946.512	.024	148314.5
Establishment Age	15762	18.569	12.184	8	111.997
Raw Mat. Cost (Local)	15504	10282000	37158846	0	9.067e+08
Raw Mat. Cost (Imported)	14055	13578306	63569430	0	1.447e+09
Raw Mat. Cost (Total)	15960	22759254	77240791	0	1.594e+09
Raw Mat Cost (Full Cap.)	15833	52498751	9.300e+08	0	7.781e+10
Cost of Fuel Oil	13064	773935.95	9944134.7	0	6.121e+08
Cost of Electricity	13715	230588.19	1453493.5	0	55180802
Cost of Wood & Charcoal	9855	129276.1	6741450.8	0	4.683e+08
Maintenance Cost	13160	157263.67	1290647.1	0	88005238
Cost of Water	12902	184548.42	1582525.8	0	1.091e+08
Cost of Goods	9820	933355.77	14132679	0	7.962e+08
Cost of Contract Work	9830	54098.933	605327.29	0	30782900
Other Costs	14256	2005848.4	17892346	0	8.014e+08
License Fee	13050	115948.85	1892222.5	0	90503654
Advertising Cost	11369	201793.87	2332606	0	90622934
Stationary, Tel & Mail	13999	130103.68	1438320	0	70000000
Legal Costs	11986	391219.79	12061321	0	6.500e+08
Transport Costs	13458	2981610.5	39831676	0	9.600e+08
Interest Payments	11170	782245.83	5114675.9	0	1.591e+08
Bank Charges	11817	181446.83	6304753.2	0	6.667e+08
Rent Payable	11530	314586.12	6333248.7	0	6.667e+08
Insurance Premium	11414	67412.511	399330.7	0	20579146
Amortization	10344	194239.04	1970847.8	0	1.372e+08
Other Costs	12899	1450777.1	12950714	0	6.775e+08
Non-Industrial Expenses	14079	3559522	22575557	0	1.334e+09
Value Added Tax	14592	3690817.1	16106285	0	5.258e+08
Excise Tax	11367	1234498.6	18577975	0	1.000e+09
Total Tax	11716	1552198.6	18591695	0	9.415e+08
Profit Income Tax	13369	1672124.8	17355277	0	9.292e+08
Total Tax	14817	8219956.7	42672997	0	9.938e+08
Current Paid-up Capital	16023	46070266	4.631e+08	0	3.626e+10

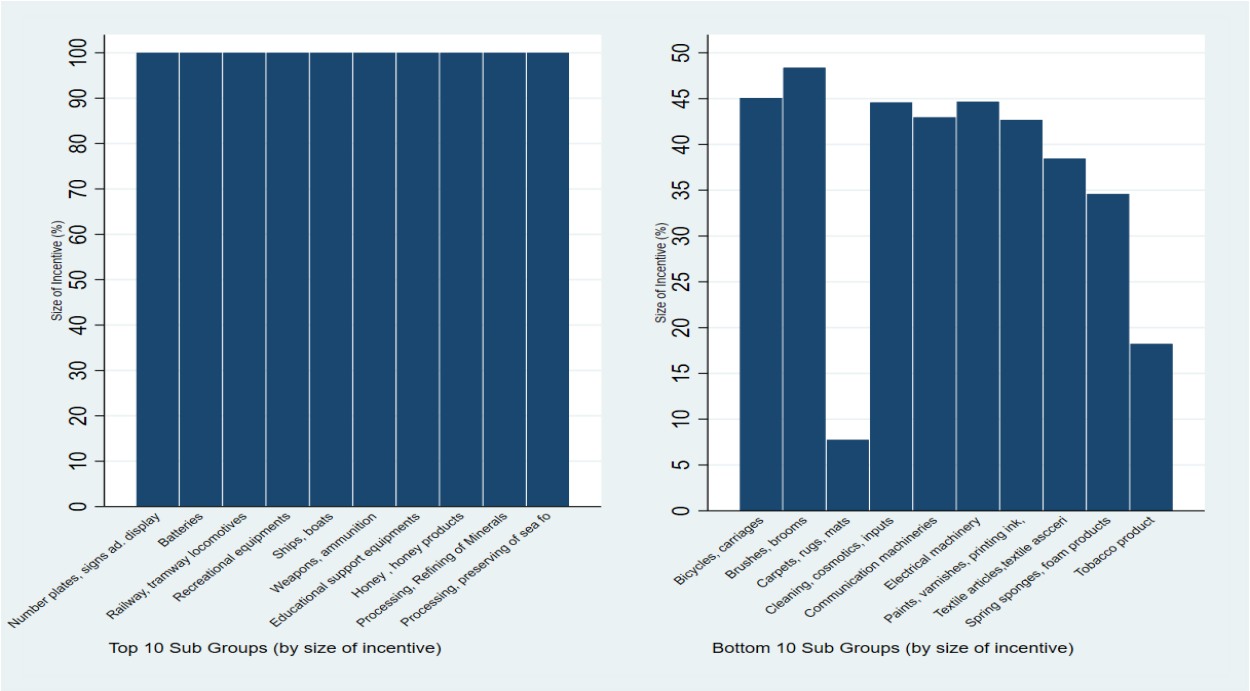
Appendix 2: Graphs

Figure A.1: Employment Shares by sectors



Source: NBE Annual Reports

Figure A.2: Top 10 and Bottom 10 Incentive Recipient Sectors



Source: Ethiopian Customs Commission

Appendix III: Establishment-Level Analysis

Dependent Variable: Total Number of Employees in Logs

VARIABLES	Pooled OLS	Fixed Effects	Random Effects
Average Wage (log)	-0.151***	-0.123***	-0.135***
	(0.00842)	(0.0120)	(0.00801)
Total Tax (log)	0.0140***	0.0120***	0.0160***
	(0.00201)	(0.00260)	(0.00186)
Current Paid-up Capital (log)	0.0431***	0.00404	0.0338***
	(0.00336)	(0.00420)	(0.00306)
Age of Establishment	0.00963***	0.00555***	0.00964***
	(0.000727)	(0.00165)	(0.000804)
Costs			
Raw Materials (log)	0.0806***	0.0457***	0.0757***
	(0.00400)	(0.00601)	(0.00385)
Imported Raw Mat (log)	0.00733***	0.00258	0.00683***
	(0.00122)	(0.00165)	(0.00115)
Fuel (log)	0.0179***	0.00743***	0.0145***
	(0.00166)	(0.00218)	(0.00155)
Utility (log)	0.0221***	0.00701*	0.0190***
	(0.00289)	(0.00395)	(0.00272)
Contract Work (log)	-0.00133	0.00290	-0.00161
	(0.00184)	(0.00217)	(0.00164)
License Fee (log)	0.000490***	0.000132	0.000346***
	(7.06e-05)	(8.36e-05)	(6.30e-05)
Advertising (log)	0.0329***	0.00972***	0.0268***
	(0.00206)	(0.00302)	(0.00200)
Stationary, Tel, & Mail (log)	0.0147***	0.0154***	0.0172***
	(0.00298)	(0.00398)	(0.00278)
Professional Services (log)	0.0127***	0.0127***	0.0152***
	(0.00198)	(0.00266)	(0.00187)
Transportation (log)	0.00686***	0.00413*	0.00815***
	(0.00191)	(0.00246)	(0.00177)
Financial Services (log)	0.0391***	0.0171***	0.0375***
	(0.00224)	(0.00323)	(0.00215)
Rents Payable (log)	0.0166***	0.0107***	0.0156***
	(0.00155)	(0.00227)	(0.00151)
Others (log)	0.0220***	0.00951***	0.0194***
	(0.00196)	(0.00247)	(0.00180)
Ownership (Base Category: Private or Co-operative			
Publicly Owned	0.245	-0.157	-0.0950
	(0.234)	(0.199)	(0.182)
Publicly or Privately Owned	0.232*	-0.285	0.171
	(0.123)	(0.206)	(0.121)
Legal Forms (Base Category: Individual Proprietor)			

Partnership	0.201***	0.0474	0.171***
	(0.0277)	(0.0434)	(0.0268)
Share Company	0.307***	0.0952	0.284***
	(0.0419)	(0.0586)	(0.0397)
PLC	0.287***	0.125***	0.263***
	(0.0208)	(0.0350)	(0.0209)
Co-operative	0.157***	0.0393	0.131***
	(0.0269)	(0.0527)	(0.0278)
Other Legal Forms	0.0341	0.0408	0.0672
	(0.0993)	(0.127)	(0.0905)
Constant	1.154***	2.779***	1.277***
	(0.0824)	(0.139)	(0.0806)
Observations	8,074	8,074	8,074
R-squared	0.659	0.179	
Establishments		5,560	5,560

Notes: Standard errors in parentheses; *** p<0.01, ** p<0.05, * p<0.1; Total tax is the sum of value added tax, excise tax, and tax on profit; utility Cost is the cost of electricity and water; Professional services fee is the cost of accounting services, legal services, etc.; Cost of financial services includes interest payment, amortization costs, bank charges, and insurance premium. Hasuman for comparison of fixed-effects and random-effects strongly rejects random-effects with a p-value of 0.0000

Appendix IV: Subsector-Level Analysis

Dependent Variable: Total Number of Employees in Logs

VARIABLES	Total Raw Materials (OLS)	Financial Services (OLS)	Total Raw Materials (Fixed Effects)	Financial Services (Fixed Effects)
Incentive	0.143	0.150	0.0154	0.0310
	(0.149)	(0.149)	(0.133)	(0.133)
Average Wage (log)	-0.260***	-0.258***	-0.0770	-0.0732
	(0.0473)	(0.0473)	(0.0472)	(0.0472)
Total Tox (log)	0.0183*	0.0181*	0.0107	0.0110
	(0.00952)	(0.00956)	(0.00902)	(0.00901)
Current Paid-up Capital (log)	0.233***	0.232***	0.210***	0.210***
	(0.0178)	(0.0178)	(0.0199)	(0.0199)
Age of Establishment	0.0207***	0.0208***	0.0211***	0.0207***
	(0.00321)	(0.00322)	(0.00388)	(0.00388)
Costs				
Raw Materials (log)	0.183***	0.184***	0.143***	0.145***
	(0.0191)	(0.0192)	(0.0180)	(0.0178)
Imported Raw Material (log)	0.0201***	0.0199***	0.0290***	0.0288***
	(0.00705)	(0.00707)	(0.00726)	(0.00725)
Fuel (log)	0.0395***	0.0395***	0.0185***	0.0186***
	(0.00812)	(0.00812)	(0.00695)	(0.00694)
Utility (log)	0.0179	0.0179	0.0181*	0.0169*
	(0.0118)	(0.0119)	(0.00975)	(0.00971)
Goods	0.0276***	0.0278***	0.00760*	0.00744*
	(0.00458)	(0.00458)	(0.00412)	(0.00412)
Contract Work	0.0181***	0.0181***	0.00357	0.00317
	(0.00594)	(0.00595)	(0.00487)	(0.00487)
License Fees	9.52e-06***	9.40e-06***	4.62e-06**	4.38e-06**
	(2.76e-06)	(2.76e-06)	(2.08e-06)	(2.08e-06)
Advertising	0.0204**	0.0208**	0.0201**	0.0204**
	(0.00954)	(0.00954)	(0.00867)	(0.00865)
Stationary, Tel, & Mail	-0.00313	-0.00264	0.00278	0.00360
	(0.0171)	(0.0171)	(0.0141)	(0.0141)
Professional Services	0.00385	0.00344	-0.00348	-0.00331
	(0.0104)	(0.0104)	(0.00893)	(0.00892)
Transportation	-0.0343***	-0.0345***	-0.0283***	-0.0273***
	(0.0122)	(0.0122)	(0.0101)	(0.0101)
Financial Services	-0.0160	-0.0152	0.00906	0.00859
	(0.0131)	(0.0131)	(0.0116)	(0.0116)
Rents Payable	0.0420***	0.0421***	0.00727	0.00737
	(0.00858)	(0.00858)	(0.00767)	(0.00765)
Others	-0.0117	-0.0129	-0.0110	-0.0115
	(0.0132)	(0.0131)	(0.0111)	(0.0110)

Interaction Terms				
Incentive X Raw Material	-0.0435		-0.0589	
	(0.0509)		(0.0487)	
Incentive X Financial Services		-0.00725		-0.0411*
		(0.0260)		(0.0231)
Constant	-1.058**	-1.097**	-1.270**	-1.351***
	(0.458)	(0.456)	(0.497)	(0.494)
Observations	646	646	646	646
R-squared	0.866	0.866	0.585	0.586
Subsectors			123	123

Notes: Standard errors in parentheses; *** p<0.01, ** p<0.05, * p<0.1; Total tax is the sum of value added tax, excise tax, and tax on profit; utility Cost is the cost of electricity and water; Professional services fee is the cost of accounting services, legal services, etc.; Cost of financial services includes interest payment, amortization costs, bank charges, and insurance premium. Hasuman for comparison of fixed-effects and random-effects strongly rejects random-effects with a p-value of 0.0000

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