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Employment Potential of the Agro-processing Manufacturing Sector in Ethiopia

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Summary

This report presents a brief assessment of the job creation potential of the agro-processing sector in Ethiopia. We used 18 years (between 1996 and 2016) census data of large and medium manufacturing industries as well as periodic surveys of small-scale manufacturing industries data, collected by the Central Statistics Agency (CSA) of Ethiopia for analysis. We also conducted key informant interviews of owners and/or managers of 10 heterogeneous agro-processing industries in Addis Ababa and its surrounding to substantiate the quantitative assessment.

Comparison of 18 years trend of capital to labor ratio of manufacturing firms engaged in food and beverage industries with all other manufacturing industries shows that the former may not have advantage in creating more jobs per unit of capital. On the other hand, comparison of various manufacturing industries using capital to labor ratio shows that industries engaged in furniture production has the smallest capital per unit of labor (or created the largest number of jobs per a given amount of capital), followed by industries engaged in wood products, glass/rubber/cement and food and beverage products while industries engaged in chemical production and in metal and metal products have the highest capital per unit of labor. Results show also that industries engaged in food production created more jobs per unit of capital than that of beverage industries, capital to labor ratio decreases with the size of the firms and it decreases overtime though the decline has not been smooth. We also computed productivity of employment and elasticities of employment in the food and beverage medium and large manufacturing (LMM) industries with respect to both gross national income and with respect to gross value of production in the sector. The elasticity results show that the growth in gross value of production in the food and beverage industries has not been matched by growth in employment.

Results from the qualitative data show that the agro-processing sector has been labor intensive and inclusive in terms of gender and skill of workers. Most of the respondents (80%) expect that the sector will remain labor intensive while 20% of the respondent noted that they are gradually moving towards capital intensive and pro-skilled labor production techniques. Note, however, that the respondents did not calculate the capital intensity to answer the question about labor intensity; they rather responded whether their companies have been creating more and more jobs overtime corresponding an increase in capacity.

All but a respondent from a micro firm identified shortage of foreign currency as their number one bottleneck and electricity power disruption as the second major challenge hindering the expansion of their industries. Except for a firm which uses its own raw material, all the remaining firms depended on imported main inputs (including wheat and barley) that made foreign currency shortage as the main challenge hindering production in full capacity and expansion of the businesses. Most of them noted also that they have been waiting for a long time to get foreign currency to renew their old machineries. Electricity power disruption is mentioned as the second most challenge, inducing 80% of the firms we interviewed to buy generator and pay, according to the respondents, significant amount of money for buying and maintaining generators and for fuel. One potential reason for employment in the sector not

growing as the growth in gross and value addition of the sector could be because of the hindering factors of foreign currency shortage and electricity power disruption.

All but a respondent from a micro firm stated that the agro-processing sector is at its infancy stage with huge employment potential in the country, particularly if the farmers produce quality agricultural products needed for input. One potential reason for that the growth in gross value of production in the sector has not been creating proportional number of jobs as the results from the capital intensity and employment elasticities show could be because of the dependence of the sector on imported inputs in the presence of foreign currency shortage and because of electricity power disruption. Designing mechanisms to substitute imports of main raw materials by home production and curtailing electricity power disruption may boost the agro-processing sector and create substantial job opportunities in the sector as well as in its backward and forward linkages.

Introduction

Ethiopia has been achieving a remarkable economic growth in the last couple of years. However, studies show that the economic growth has been poorly linked with job creation and poverty reduction (Page & Shimeles, 2015). The fastest growing countries in Africa in general (e.g., Ethiopia, Rwanda, Tanzania and Uganda) registered the lowest employment growth rates, and there has been strong negative correlation between economic growth rate and employment rate in Africa (Page & Shimeles, 2015; Woldemichael et al., 2017). Moreover, wage employment remains scant where the agriculture sector and the informal sectors remaining the main sources of employment and contributing to keep the unemployment rate at low level (World Bank, 2018; Page & Shimeles, 2015).

The Ethiopian government has been taking various measures and adopting strategies to transform the economy and to curtail the poverty and unemployment problems (Norman et al., 2016). One of the main sectors that the government has been considering as engine to transform the economy and to create job opportunities for the growing youth is the agro-processing sector (GTP-II, 2015; The Ethiopian Herald, 2019). The government has been establishing 14 agro-processing industrial parks across the country and it planned to establish 17 more industries until 2025 (Africfarming.com, 2017).

Indeed, the 2015/6 Large and Medium Manufacturing¹ (LMM) Census report showed that the food and beverages manufacturing sector has been the largest among LMM in the country in a number of indicators. For instance, the food and beverages sector constituted 29% of the number of the LMM industries registered in the country, created 39% of the employment in LMM and contributed around 43% of the value added by the manufacturing industries to the national account. Moreover, the sector is the second largest sector (next to the non-metallic

¹ “The Manufacturing sector comprises establishments engaged in the mechanical, physical, or chemical transformation of materials, substances, or components into new products. The establishments are often described as plants, factories, or mills and typically use power-driven machines and materials-handling equipment. They include all intermediate processes required for the production and integration of a product's components.” (CSA, 2017)

minerals industries) among LMM in terms of new capital expenditure (investment) in 2015/6, where around 32% of the 18 billion Birr investment in 2015/6 was in the food and beverage industries (CSA, 2017). Similarly, the small-scale food and beverage industries accounted the largest share among the SSM in terms of a number of indicators (CSA, 2017). The aim of this report is to assess the employment potential of the agro-processing sector by examining the capital to labor ratio (k/l) time-trend of the food and beverage industries relative to other industries and by conducting key informant interviews of 10 heterogeneous agro-processing industries.

Data and method of analysis

We used both secondary and primary data for this report. The secondary data is the CSA manufacturing survey time series data, and the primary data is a qualitative data that we collected by conducting key informant interview with 10 agro-processing industries.

The CSA manufacturing survey

The secondary dataset we used is the LMM and SSM industries dataset collected by CSA of Ethiopia. CSA has been conducting surveys on the country’s manufacturing activity since the mid-1970s. The coverage and frequency of the surveys differ by size of the industries. CSA has been conducting annual census of manufacturing industries that use power driven machines and employ ten or more workers. Moreover, CSA conducted surveys periodically on Small-Scale Manufacturing (SSM) that use power driven machines but employ fewer than ten workers. For this study, we used 18 years surveys of manufacturing industries conducted from 1996 to 2016 that we have access to. We categorized the manufacturing firms in to four sizes using the number of workers they engaged in as a measure. We considered all manufacturing industries as micro if the number of workers they engage is less than six, small industries if they engage in between 6 and 29 workers (both margins inclusive), medium if they engage in between 30 and 99 workers and large manufacturing industries if they engage in more than 100 workers.

Using the International Standard Industrial Classification (ISIC), we further classified the industries in to eight categories as presented below in Table 1. Table 1 presents the number of industries under each category aggregated over the 18 time-period that we used for analysis after we conducted data cleaning, for instance, removing observations with missing values of key variables. The table shows that the largest number of manufacturing industries in all categories of size are the food manufacturing industries.

Table 1. Type of manufacturers and number of observations (N*T; T =18) collected between 1996 to 2016 in 18 surveys

Type of manufacturing industry	Large & medium	Small	Micro	Total
Food	5,367	10,550	39,464	55,381
Textile & leather	4,629	3,895	10,260	18,784
Cement, rubber, glass	4,243	8,591	7,669	20,503
Metal and metal product	2,615	3,984	12,700	19,299
Wood products	2,277	3,793	3,374	9,444

Chemical & chemical products	2,136	1,691	506	4,333
Beverage	1,725	578	2,031	4,334
Furniture	1,066	6,247	17,331	24,644
Total	24,213	39,419	93,454	157,086

Note 1. Data obtained from Central Statistics Agency (CSA) of Ethiopia. Separate survey data about small manufacturers is available at CSA only starting from 2002. We extracted micro and small manufacturers for the earlier years from the survey of large and medium manufacturers since the latter data includes also firms having fewer than 10 workers engaged in production.

Qualitative data

To further understand the agro-processing sector and its potential for job creation, we conducted key informant interviews at 10 industries. We focused only on agro-processing manufacturing industries related to food and beverages, excluding the remaining subsectors of the agro-processing sector, such as leather, textiles, fuels, animal feed or forestry products. We stratified the industries of interest by ownership (i.e., foreign owned, domestic private owned, state owned and joint venture), size (i.e., micro, small and medium, and large), capital intensity (labor intensive having k/l ratio less than the sectoral average, and capital intensive having k/l ratio above the sectoral average) and export status. We selected one industry from each category of the industries and a total of 10 industries. We selected the industries using probability without replacement method among the sampling frame of food and beverage industries located in Addis Ababa and its surrounding². That is, first we selected one industry from each of the foreign owned, domestic private owned, state owned and joint venture industries by probability method. Then, we selected one small and medium industry and another large industry from the sampling frame after excluding the four already selected industries. We then selected one capital and one labor intensive industries from the sampling frame by probability method after excluding the industries selected before. Finally, we selected one exporting industry from the sampling frame of exporting industries after again excluding the industries that were already selected before. We selected a micro firm by convenient and engaging in a different food and beverage sector than the nine firms we selected since there is no sampling frame of micro firms engaged in food and beverage production.

Method of analysis

We used graphs and descriptive statistics for analysis. Our focus is on food and beverage industries. Nevertheless, we also examined the job creation potential of other industries too using capital to labor ratio (i.e., capital intensity) and employment elasticities as indicator variables. We used the September month number of workers engaged in the industry for analysis.

² We could exclude industries located outside Addis Ababa and its surrounding for this report since most of the industries in Ethiopia are located in and around Addis Ababa and since our sample size of 10 industries that we selected based on our prior agreement with the research teams from other collaborating countries is too small to select from the 9 regional states and 2 administrative cities available in Ethiopia.

Results

In this section, we present the results we found from the quantitative and qualitative surveys. Before we presented the capital intensity of the food and beverage industries, we presented the overall capital intensity of the manufacturing sector.

Trends in capital intensity of industries

Capital intensity is considered as indicator of job creation potential of industries (Bartel, & Lichtenberg, 1991; Cette et al., 2016; Samson et al., 2002). Labor intensive industries use more labor than capital while capital intensive industries use technologies that save labor and labor cost. Economic growths arising from very high capital intensity are termed as jobless growth (Cette et al., 2016; Newman et al., 2016; Page and Abebe, 2015).

The capital intensity of manufacturing industries in Ethiopia

Figure 1 presents the capital intensity of the manufacturing sector (excluding micro industries) in Ethiopia overtime. It presents both the nominal value of capital per worker and the real value of capital per worker after adjusting the former for overtime change in the value of fixed assets because of inflation. We used the GDP deflator that we obtained from the 'economywatch.com' website to deflate the nominal value of capital goods. The figure shows that the sector is becoming increasingly capital intensive in nominal terms. However, the real value of capital intensity shows mixed results and was relatively more volatile in pattern. The real value of capital intensity was first increasing between 1996 and 2002 and then started declining sharply afterwards. We used the real value of capital for the sections that follow.

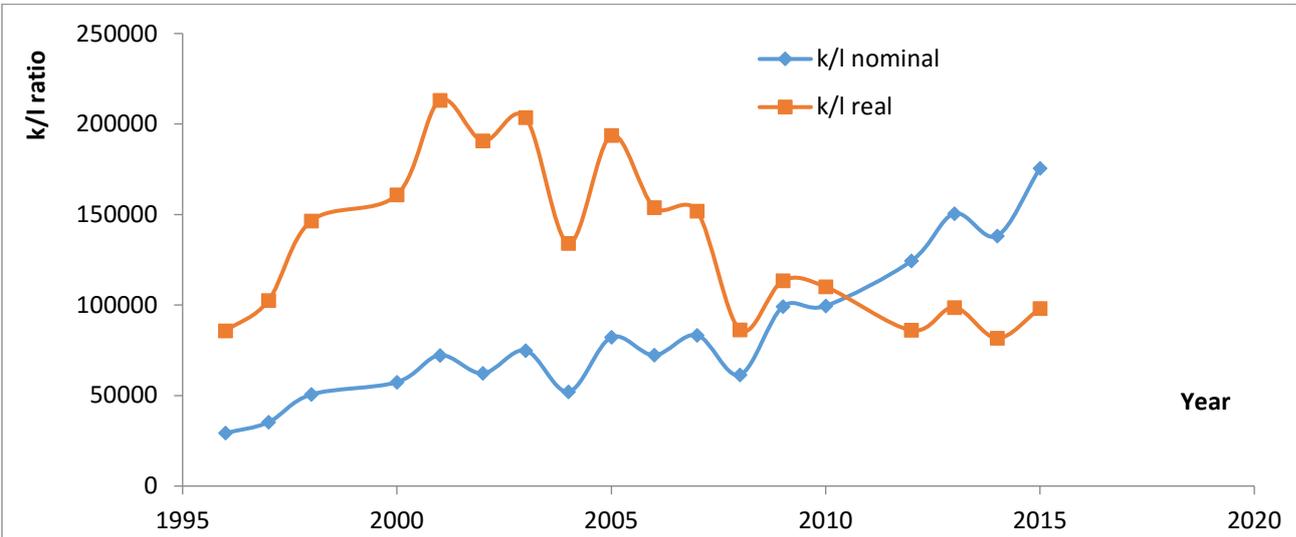


Figure 1. The capital to labor ratio of all but micro manufacturing industries in Ethiopia

Note 2. Authors' compilation from CSA's SSL & LMM manufacturing survey data

Figure 2 presents the capital intensity of the manufacturing sector in Ethiopia disaggregated by the size of the industries. The results show that, except for micro industries which had noisy pattern, there is a clear and time-consistent size difference in capital intensity. The results show that capital intensity decreases with the size of the firms. That is, the larger the industry in terms of the number of workers engaged in the firm, the less capital intensive the industry is, implying that larger than smaller sized firms created more job per unit of capital. The implication of this results is that the government should prefer larger manufacturing industries to smaller once to boost employment. Note, however, that we do not control for other factors that may systematically relate with capital intensity and size of industries that may affect the observed correlation nor we controlled for human capital. The results further reveal that the small, medium and large industries showed similar overtime pattern in terms of capital intensity: capital intensity first slightly increased overtime until around 2002 and then declined gradually. Micro manufacturing industries showed noisy pattern, and, thus, we excluded them from the analysis in the sections to follow.

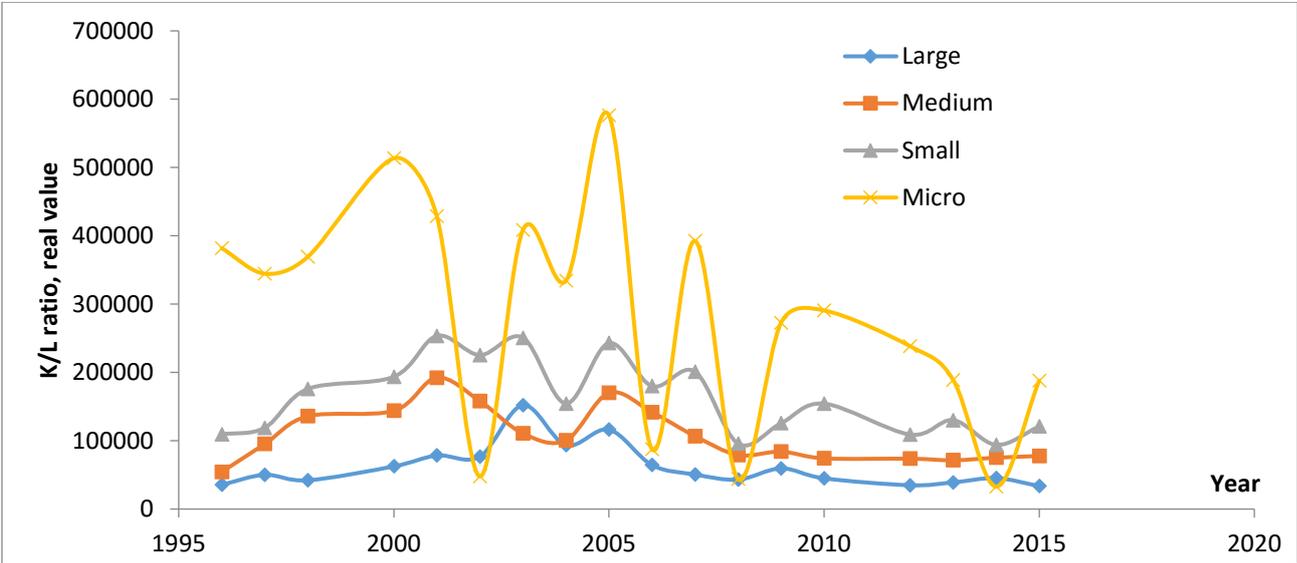


Figure 2. Capital intensity (real value) of manufacturing industries in Ethiopia
 Note 3. Authors' compilation from CSA's SSL & LMM manufacturing survey data

Capital Intensity of Food and Beverage Industries Versus Other Industries

Figure 3 presents the capital intensity of food and beverage versus other manufacturing industries overtime. The results show that the capital intensity of food and beverage manufacturing industries was less than that of other manufacturing industries between 1996 and 2001 and then it becomes higher afterwards where the gaps between the two categories of industries gradually declined. Overall, the results show that the food and beverage sector does not have job creation advantage than all other sectors taken together.

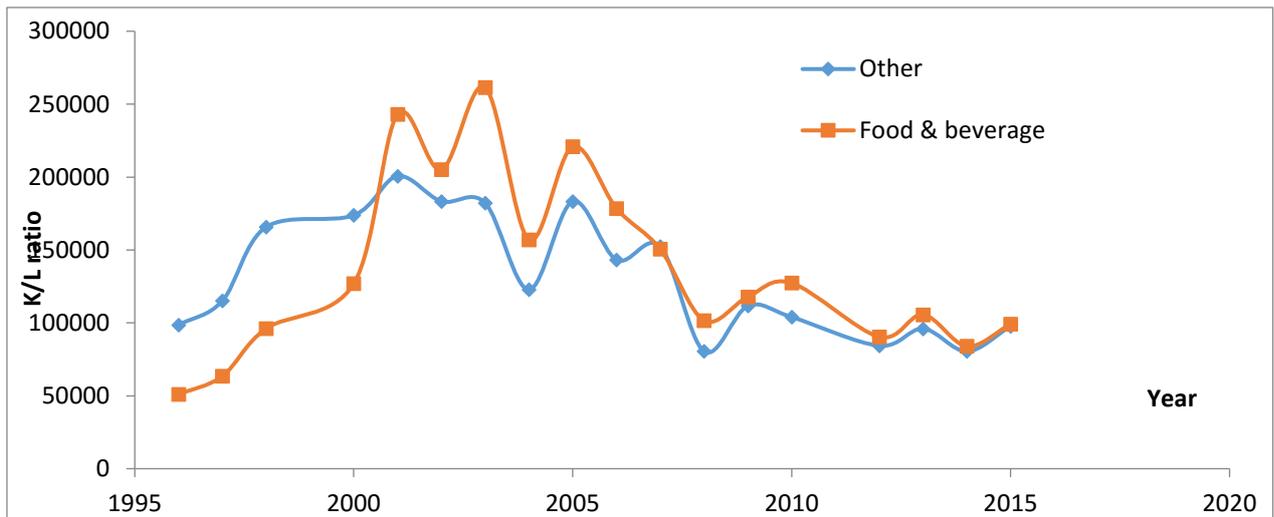


Figure 3. Capital per labor ratio of food and beverage versus other manufacturing industries

Note 4. Authors' compilation from CSA's SSL & LMM manufacturing survey data

In Figure 4, we further presented the capital intensity of various sectors in the manufacturing industries. The results show that there is significant variation in capital intensity among the manufacturing industries though the differences have been gradually declining overtime. The results further show that our sector of interest, the food and beverage sector, has had the third lowest capital intensity in the 1990s and since 2014 while the furniture producing manufacturers have the lowest capital intensity throughout most of the survey periods followed by the wood production industry.

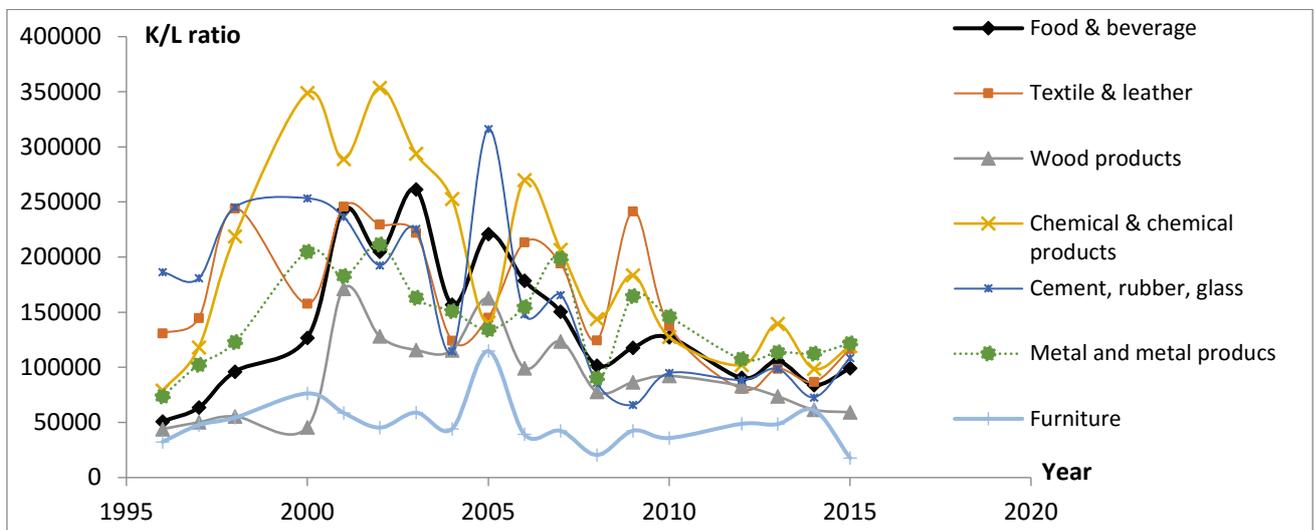


Figure 4. Capital intensity of manufacturing industries by their products

Note 5. Authors' compilation from CSA's SSL & LMM manufacturing survey data

We then compared the capital intensity of the food and beverage manufacturing industries as shown in Figure 5. The results clearly show that the beverage sector has been capital intensive than that of the food sector since 2004. Moreover, the capital intensity of the food sector has been declining since 2003 and has been relatively stable than that of the beverage sector.

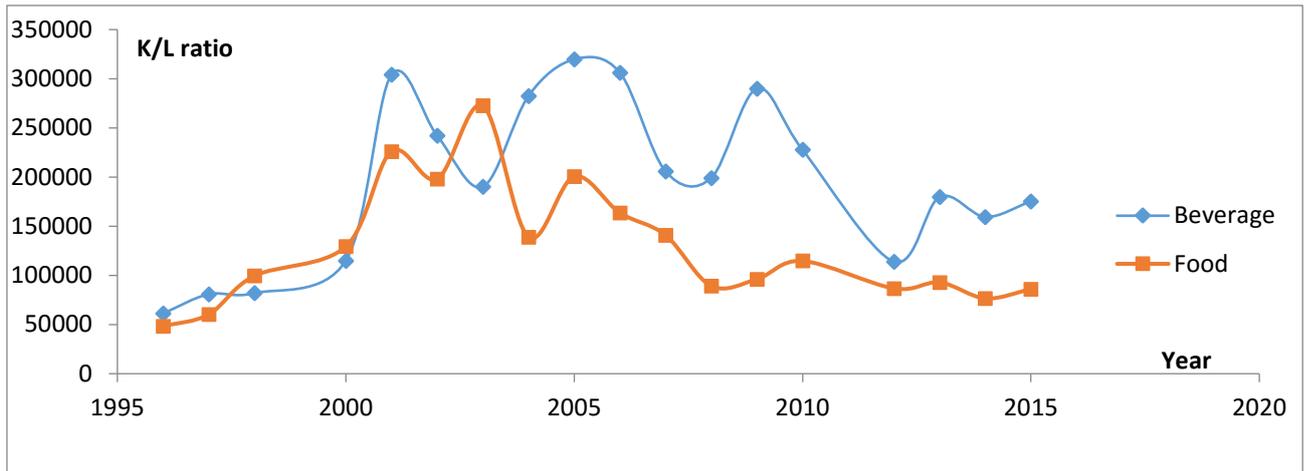


Figure 5. Capital intensity of food versus beverage manufacturing industries

Note 6. Authors' compilation from CSA's SSL & LMM manufacturing survey data

Figure 6 presents the capital intensity comparison between food and beverage industries disaggregated by the size of the industries. The results show that small and medium sized beverage industries have the most volatile and the highest capital intensity. Whereas, large and medium sized food industries have the lowest capital intensity. Moreover, the results show that capital intensity of the all sized food industries and the large beverage industries was first increasing until around 2005, and then started declining after wards though the decline has not been smooth for small food and large beverage industries. These results indicate that the food sector has been pro-poor by creating relatively more jobs per unit of capital than that of the beverage sector.

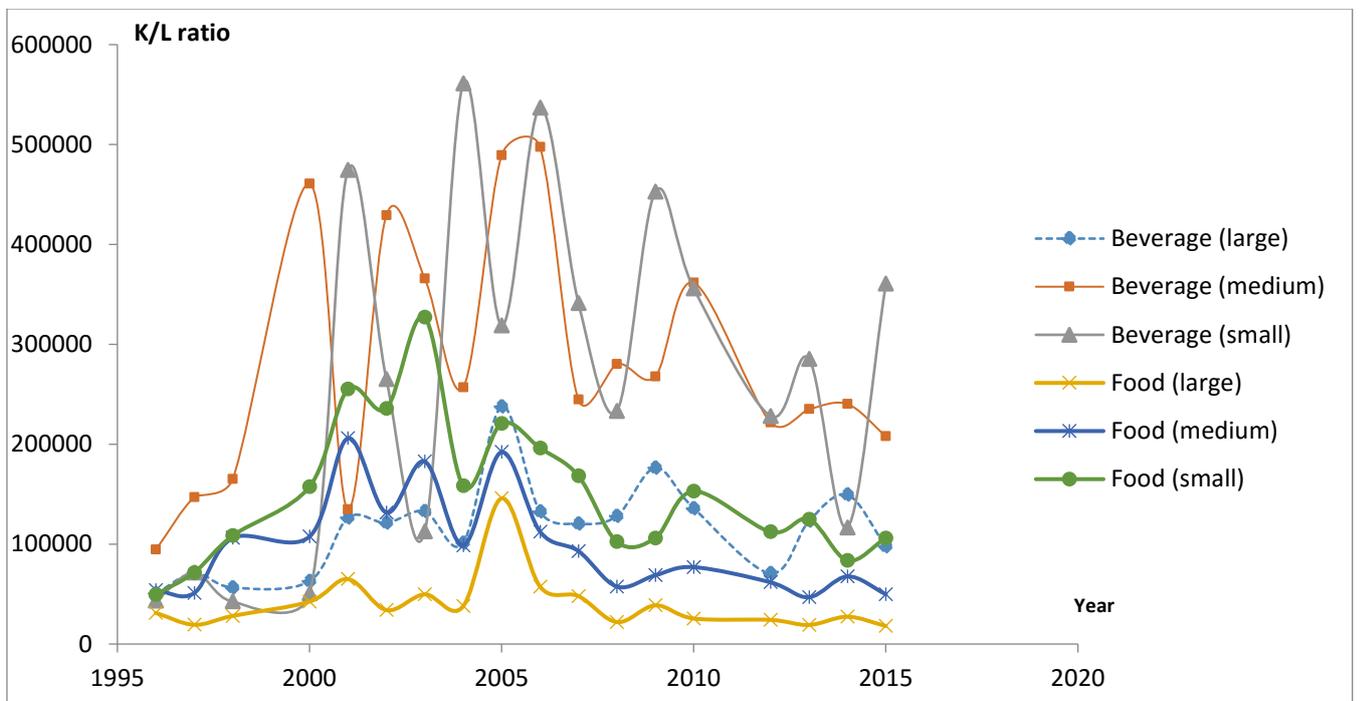


Figure 6. Capital intensity of the food and beverage industries disaggregated by size

Note 7. Authors' compilation from CSA manufacturing survey data

Value added of and employment in the food and beverage sector

Table 2 presents the value addition and employment opportunities created by the food and beverage LMM industries from the years 2012/13 to 2016/17. Note that the value addition is in Ethiopian Currency (Birr - ETB), and deflated using the GDP deflator to adjust changes due to inflation. The second column of the shows that the sector's value addition increased overtime; it almost doubled in just four years of time from about 13.94 billion ETB in 2012/13 to 27.6 billion ETB in 2016/17. The third column presents the share of the value addition of the food and beverage LMM industries to the total value addition of the LMM industry in the country. The results show that the sector constituted the largest share of value addition among medium and large manufacturing industries ranging from 48.51% in 2014/15 to 30.06% in 2016/17.

Even though the value addition of the food and beverage industries almost doubled in just four years as we saw before, it seems that this substantial value addition increase has not been creating proportionally large number of employment opportunities. The number of new jobs created increased only by about 10% from 2012/13 to 2016/17. Moreover, the share of female employees in the food and beverage LMM sector remained less than one-third from 2012/13 to 2016/17, though the share of female employees slightly increased from about 25% in 2012/13 to 29% in 2016/17. Nevertheless, the sector employed around 21.6% of the total employment in the LMM industries in the country in 2016/17.

Table 2. Value addition and employment in the food and beverage LMM industries

Year	Value add of the food & beverage LMM industries at market price (in billion ETB)*	The share of the sectorial value added in manufacturing value added	Share of the sectorial value added in total value added	Number of people engaged in in the sector	Share of female employees, %	Share of the sector employment in manufacturing employment
2016/17	27.6	30.06	1.75	64538	29	21.6
2015/16	29.2	40.81	2.05	59868	28	21.7
2014/15	15.0	48.51	2.17	64745	27	27.6
2013/14	11.9	37.91	1.89	59415	25	19.5
2012/13	13.94	32.73	1.75	58710	25	18.7

Note 8. The '*' denotes that the value adjusted for inflation using GDP deflator (using 2010/11 base year). Data compiled from NBE 2016/17 annual report and CSA LMM 2018 report.

Employment Elasticity of the Food and Beverage Sector

Table 3 presents the gross value production of the LMM food and beverage industries in ETB (deflated by GDP deflator) along with productivity of employment (i.e., gross value of

production per employee) and elasticity of employment. Gross value of production and productivity of employment of the sector increased respectively by about 35% and 23% from 2012/13 to 2016/17. However, the growth has not been consistent. For instance, both gross value of production and productivity of employment were higher in 2015/16 than in 2016/17, probably because of the political instability problem.

Table 3 further presents the food and beverage LMM sectorial elasticity to total output (real GDP at current market price) and sectorial employment elasticity (i.e., the ratio of percentage change in employment to percentage change in gross value of production in food and beverage industries), the latter disaggregated by gender. The elasticity results presented in Table 3 show inconsistency, and most of them have unexpected signs. For instance, the last column presented that employment elasticity with respect to gross value of production of the food and beverage LMM is negative, which is unexpected, implying that the value addition in the sector has not been re-invested in the sector or the investment from the value addition has been labor-saving.

Table 3. Employment elasticity of the food and beverage sector

Year	GDP	Gross value of production (Billion ETB)*	Productivity of employment (Gross value of production per employee) (million ETB)*	Sectorial employment elasticity to total output (real GDP)	Sectorial employment elasticity		
					Female	Male	Total
2016/17	1806.7	62.24	0.96	0.07	-0.84	-0.37	-0.50
2015/16	1528.0	73.76	1.23	-1.00	-0.07	-0.09	-0.08
2014/15	1298.0	38.65	0.60	0.86	-1.78	-0.40	-0.74
2013/14	1060.8	43.97	0.74	0.12	0.50	-0.56	-0.29
2021/13	866.9	45.85	0.78	-	-	-	-

Note 9: The '*' denotes that the value adjusted for inflation using GDP deflator (using 2010/11 base year). Data compiled from NBE 2016/17 annual report and CSA LMM 2018 report.

Results from the Qualitative Study

In this section, we presented results we found from key informant interviews that we conducted at 10 heterogeneous agro-processing firms. We conducted KIs at each of the following firm types: privately owned, state owned, joint venture, owned by a foreign national, micro sized firm, small and medium size firm, large firm, a firm having higher (smaller) capital to labor ratio than the average ratio in the agro-processing sector and an exporting firm.

Characteristics of Firms and their Markets

Table 4 presents the characteristics of firms where we conducted KIIs at. Five of the firms engaged in beverage production, four of them engaged in food production and one of the firms produced both food and beverage products. The firms employed from 5 to 13,000 workers, and eight of the firms mentioned that their firms have been growing overtime, employing more and more workers. However, two of the firms mentioned that their production has been declining and they were forced to reduce the number of workers because of lack of foreign currency to buy new machineries to replace the very old once.

Four of the ten firms have been selling their products for both the domestic and international markets while the rest of the firms have been selling their products only to the domestic market. Most of the firms (80%) use at least one of their raw materials from abroad. Indeed, the main inputs of production for seven of these firms have been imported raw materials from abroad because of limited supply and/or poor-quality local inputs. Only a firm engaged in coffee processing and coffee making and another firm that produces its own inputs depend exclusively on local inputs.

Table 4. Agro-processing firms we conducted KII and their characteristics

No.	Type of industry	No. of workers in 2019	Ownership type	Growth pattern	Output market	Input source (market)
1	Beverage, juice	100	Private	Growing overtime	Domestic	Import (main) & local
2	Food, flour	10	Private	Declining, can't get forex to buy new machinery	Domestic	Imported
3	Food: biscuits	300	Joint: government & foreign	Growing	Domestic	Import and local
4	Multiple: food & beverage	13,000	foreign	Growing	Export & domestic	Domestic – own production
5	Food: flour	105	Private	Declining because of input shortage	Domestic	Imported and limited local
6	Beverage: alcohol & non-alcohol	830	Joint (local & foreign)	Growing	Export & domestic	Imported (80%) and limited local
7	Multi-business: e.g. juice	308	Private	Growing	Sell to a company	Imported
8	Food	5	Private (PLC)	Growing	Sell directly to consumers	Imported & local
9	Beverage	620	State owned	Growing	Export & domestic	Local, import bottles and supplements
10	Coffee	1400	Private	Growing	Export & domestic	Local

Competitiveness of the industries and their main challenges

Table 5 presents a summary of the competitiveness of the firms, the types of customers, the main challenges the firms have been facing and their job creation potential. Nine of the firms reported that the agro-processing sector is still at its infancy and, as a result, there is no concerning problem regarding the output market since supply is much smaller than demand for the agro-processing products in Ethiopia. Indeed, none of them mentioned lack of market for their products as the main challenge for them. Our key informant interviewee from a beer firm noted that there is competition in the market because of many local firms and imported beer, but the respondent noted that, they have been doing well and the competition has not been the main concern. However, five women engaged in making injera and baking bread for distribution and for their own restaurant noted that they have been facing stiff competition from micro and mostly informal competitors. The main buyers of the products of agro-processing firms include distributors, retailers, government, international and local agents and final consumers.

The main challenges that all but the micro firm mentioned include power distribution (electricity) and shortage of input because of the critical problem of foreign currency shortage in the country. Most of the firms noted that they would expand their business had they get foreign currency to buy machineries and inputs. Two of the firms informed us that their production is declining overtime since they have been waiting for a long time to get foreign currency to replace the very old machineries they have. Similarly, electricity power disruption is another main challenge that they maintained; most of the firms reported that they are induced to buy generator and incur huge fuel cost because of power distribution. This result is consistent with the result that the Ethiopian Central Statistics Agency also have found in its annual census of large and medium manufacturing industries.

We also asked the respondents about whether the growth in their firms have been labor or capital intensive. Most of the firms (80%) noted that the growth in their firms have been creating a number of jobs for mostly unskilled labor. They expected the same in the future too. However, two firms noted that they have been gradually moving towards capital intensive technologies. Note, however, that the respondents did not calculate the capital intensity to answer the question; they rather responded whether their companies have been creating more and more jobs overtime.

Table 5. Competition, type of buyers, main challengeness of firms and their job creation potential

No.	Competition	Buyers	Main challenge, barriers to growth	Is growth jobless	Type of labor
1	No output market problem	Distributors, retailers and door-to-door to consumers	Imported input shortage, foreign currency to buy machineries, electricity (forced to buy generator)	No	Most unskilled
2	No output market problem	Bread makers	Forex shortage to buy new machinery, electricity; no generator	No	Mostly unskilled

3	No output market problem	All types including gov't	Input shortage, input price increase, electricity (use generator)	No	Mostly unskilled, 83%
4	No output market problem	Exporting and Ethiopian Commodity exchange (ECX)	Electricity (use generator), fund access and delay	Yes, gradually moving to capital intensive	Gradually towards skilled labor
5	No output market problem	Bread makers	Electricity, input shortage, political instability	Will be more capital intensive	Mostly unskilled
6	There is high competition, but not worrying	International and local agents & distributors	Electricity (use generator), road, political instability, lack of inputs locally & gov't regulation	No	Mostly unskilled
7	No output market problem	Sells to a company	Forex shortage to buy inputs, electricity (use generator)	No	Most medium skilled
8	High competition	Consumers	Infrastructure (electricity, road & water)	No	Unskilled
9	No output market problem	Agents and consumers	Input shortage, forex, gov't regulation	No	Unskilled
10	No output market problem	Agents and consumers	Input shortage	No	Medium skill

Working conditions and skilled labor access

Table 6 presents whether the firms have difficulty to hire workers, the labor turnover situation, the inclusiveness of the jobs, occupational safety and health (OSH) conditions and industrial relation conditions in the agro-processing firms where we conducted key informant interviews.

All of the firms noted that getting the right type of workers they need for their factories has not been a major concern. They responded that have been providing trainings at work at short time and insignificant cost whenever the workers lack some skills. They indicated that most of the activities in their firms do not need special skills. For the activities they need special skills, they recruit from abroad for a short time period or send their workers even abroad for training. Labor turnover has not been also a problem for 80% of the firms; 20% of them noted though that they have been paying low salary and, as a result, labor turnover has been a problem for them.

Regarding the inclusiveness of the jobs for women, more than half of the workers have been female in at least 50% of the firms. The lowest participation of women was 18% in a factory. Most of the firms noted also that they complied with the OSH requirements of the country and they provided all the necessary protective materials and tools for their employees. Moreover, most of the respondents noted that most of the workers in their firms have permanent work contract with specified and written agreements. The respondents noted that their workers work eight hours per day and they pay for hours worked over normal working hours. Regarding the availability of labor unions at workplace, only three respondents responded that there are labor unions in their factories. The rest noted that there are no labor unions, but there have been interesting industrial relations between workers and employers. Nevertheless, such type of information needs triangulation with employees' responses that we did not do because of time and budget constraint.

Table 6. labor turnover, job inclusiveness and labor supply

No.	Getting the right workers	Labor turnover	Female, %	OSH	Employment contract, permanent, %	Availability of labor union
1	Not a problem	Very low	65	Compile	60	No
2	Not a problem	Very low	30%	Compile	95	-
3	Not a problem	High; low wage	50	Compile 90% of the requirements	98	Yes
4	Not a problem	Low	-	Compile	Most	No, we have strong social interaction though
5	Not a problem	High; low wage	70	Compile	44	No
6	Not a problem	Very low	18	Compile	65	No, no interest from workers
7	Not a problem	Very low	53	Compile	95	Yes
8	Not a problem	Very low	100	No standard	100	-
9	Not a problem	Very low	36	Compile	70	Yes
10	Not a problem	Very low	60	Compile	Most	no

We also asked the informants about the supply chain along their products. Most of the respondents noted that they depended on imported raw materials, in that they have limited

or no information about the supply chain associated with their production. The firms engaged in flour production have contractual agreement with the government, in that the government provided them imported wheat at relatively lower price, and they, in turn, distributed to the bakers at a reasonable price. Similarly, the firms which used sugar and molasses as input noted that they have agreement with the Ethiopian Sugar Corporation on the volume and price of sugar and molasses they trade. Two firms noted that they have been working with farmers with prior (to production) agreement regarding the type and quality of products they produce and on the price.

All but a respondent from a micro firm stated that the agro-processing sector is at its infancy stage with huge employment potential in the country. Designing mechanisms to substitute imports of main raw materials by home production may boost the agro-processing sector and create substantial job opportunities in the sector as well as in its backward and forward linkages.

Conclusion

Ethiopia has been achieving a remarkable economic growth in the last couple of years. However, studies show that the economic growth has been poorly linked with job creation and poverty reduction. Moreover, wage employment remains scant where the agriculture sector and the informal sectors remaining the main sources of employment, contributing also to keep the unemployment rate at relatively low level. The Ethiopian government has been considering the agro-processing sector as engine to transform the economy and to create job opportunities for the growing youth in the country. This report presents assessment of the agro-processing sector's potential for job creation in Ethiopia.

We used 18 years (from 1996 to 2016) of census data of large and medium manufacturing industries as well as periodic surveys of small-scale manufacturing data of the Central Statistics Agency (CSA) of Ethiopia for analysis. We also conducted key informant interviews with owners and/or managers of 10 heterogeneous agro-processing firms to substantial the quantitative assessment. We conducted KIIs at each of the following different types of firms: privately owned, state owned, joint venture, owned by a foreign national, micro sized firm, small and medium size firm, large firm, a firm having higher (smaller) capital to labor ratio than the average ratio in the agro-processing sector and an exporting firm.

Comparison of 18 years trend of capital to labor ratio of manufacturing firms engaged in food and beverage industries with all other manufacturing industries shows that the former may not have advantage in creating more jobs per unit of capital. Comparison of various manufacturing industries using capital to labor ratio shows that industries engaged in furniture production has the smallest capital per unit of labor followed by industries engaged in wood products, glass/rubber/cement and food and beverage products. Results show also that industries engage in food production created more jobs per unit of capital than that of beverage industries, capital to labor ratio decreases with the size of the firms and it decreases overtime though the decline has not been smooth.

Results from the qualitative data show that the agro-processing sector has been creating a number of job opportunities and it has been inclusive in terms of gender and skill of workers. Most of the respondents (80%) expect that the sector will remain labor intensive while 20% of the respondent noted that they are gradually moving towards capital intensive and pro-skilled labor production techniques. All but a respondent from a micro firm identified shortage of foreign currency as their number one bottleneck and electricity power disruption as the second major challenge hindering the expansion of their industries. Foreign currency is mentioned as the main challenge most of the firms depended on imported main input including wheat and barley. Most of them noted also that they have been waiting for a long time to get foreign currency to renew their old machineries. Electricity power disruption is mentioned as the second most challenge, inducing 80% of the firms we interviewed to buy generator and pay, according to the respondents, significant amount of money for buying and maintaining generators and for fuel. All but a respondent from a micro firm stated that the agro-processing sector is at its infancy stage with huge employment potential in the country. Designing mechanisms to substitute imports of main raw materials by home production may boost the agro-processing sector and create substantial job opportunities in the sector as well as in its backward and forward linkages.

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