



---

# Effect of COVID-19 on Trade in Case of Afar Regional State

Dagmawe Menelek Asfaw\*, Abdurhman Kedir Ali, Mohammed Adem Ali

Department of Economics, College of Business and Economics, Samara University, Samara, Ethiopia

## Email address:

[dagmawemenelek@gmail.com](mailto:dagmawemenelek@gmail.com) (D. M. Asfaw)

\*Corresponding author

## To cite this article:

Dagmawe Menelek Asfaw, Abdurhman Kedir Ali, Mohammed Adem Ali. Effect of COVID-19 on Trade in Case of Afar Regional State.

*International Journal of Economic Behavior and Organization*. Vol. 10, No. 2, 2022, pp. 64-71. doi: 10.11648/j.ijebo.20221002.14

**Received:** February 28, 2022; **Accepted:** April 6, 2022; **Published:** April 14, 2022

---

**Abstract:** The COVID-19 pandemic will not only suppress economic growth, it will also adversely impact sustainable development, trade in the short run generally in the world and particular in Ethiopia, Afar. This study analyzed effect of COVID-19 on social welfare in case of Afar regional state, Ethiopia using panel data collected from a sample of 120 in Asyaita, Dubti Samara-logia and Awash town. To address the objective of the study, both descriptive statistics and econometric models were used to analyze the data. The descriptive analysis results revealed that the main source of income was emanated from self-employee (81.67%), from the total households 70% of them were engaged in service sector, due to COVID-19 the income trends of 81% households were decrease, increase expenditure on food & food items (13%) and on service delivering (15%). The econometrics model was based on panel data analysis from February 13, 2020 to June 13, 2020 to investigate the effect of COVID-19 on social welfare in the case of afar regional stated. After conducting necessary pre and post estimation test, we had found the following results. The econometrics model found that the three basic policy variables (number of COVID-19 victim, number of days with COVID-19 disease and transportation ban) were adversely affect welfare of the society by decreasing the income of households and increasing their expenditures. Finally, considering regional experience, econometric and descriptive results, this study recommends that the government and the concerned policy maker could undertake:- the government should give more attentions to service sector, supported those self-employee and daily laborer, make awareness to the society about COVID-19 epidemic, place alternative mechanism to fill potential trade gaps.

**Keywords:** COVID-19, Social Welfare, Panel Data Analysis, Fixed Effect, Random Effect

---

## 1. Introduction

COVID-19 infection is an infectious disease that is caused by the severe acute respiratory syndrome known as corona virus. This virus was founded in Hubei province in China (Wuhan city) in first time on December 2019. However, right know WHO declared that COVID-19 is a global pandemic disease and has affecting more than three million people all over the world. Many of the countries had made mild preparations knowing that the diseases would ultimately catch up with them [1] due to inadequate information on its short- and long-term effects, financial, economic and political incapability's. Some of the common signs of COVID-19 include fever, shortness of breath and dry coughs [2]. Other uncommon symptoms include muscle pains, mild diarrhea, abdominal pain, sputum production, loss of smell, as well as sore throat.

The COVID-19 pandemic has hit almost all African countries and appears poised to worsen dramatically. The disruption of the world economy through global value chains, the abrupt falls in commodity prices and fiscal revenues and the enforcement of travel and social restrictions in many African countries are the main causes of the negative growth. Exports and imports of African countries are projected to drop by at least 35% from the level reached in 2019. Thus, the loss in value is estimated at around 270 billion US dollars. To fight against the spread the virus and medical treatment will lead to an increase of public spending in Africa estimated to by at least 130 billion [3].

According to Ethiopia, U, for the period (2015-2019), total Africa trade average value was US\$760 billion per year which represents 29% of Africa's GDP [4]. Intra-African trade accounts for only 17% of total trade of African countries. Intra-African trade is one of the lowest compared

to other regions of the world, at 16.6% of the total. The low levels of industrial transformation, infrastructure development, financial and monetary integration and the tariff and non-tariff barriers, are at the root of this situation. This makes the African economy an extrovert economy and sensitive to shocks and external decisions. Besides, it is practically impossible for the continent to take an economic advantage of the wide spread of COVID-19 in other parts of the world, due to its inability to transform its raw materials to respond to the potential high demand of goods and services of the domestic and international markets. They may act as an additional constraint on Africa's productive transformation, by making trade in value added more difficult.

Despite the initial inclination of policy makers to close borders, maintaining trade flows during the COVID-19 pandemic will be crucial. Trade in both goods and services will play a key role in overcoming the pandemic and limiting its impact in the following ways: by providing access to essential medical goods (including material inputs for their production) and services to help contain the pandemic and treat those affected, ensuring access to food throughout the world, providing farmers with necessary inputs (seeds, fertilizers, pesticides, equipment, veterinary products) for the next harvest, by supporting jobs and maintaining economic activity in the face of a global recession. Substantial disruption to regional and global value chains will reduce employment and increase poverty [5].

Global demand collapsing for many commodities and transport links also severely disrupted, immediate declines are certainly to be expected for several of Ethiopia's exports—likely in the range of \$300-\$400mn during April-June 2020 (from expected levels) considering impacts in the flower and textile sectors. Moreover, service exports will be hit sharply, including for Ethiopian Airlines revenue (about \$1.5bn on an annualized basis if a 30 percent decline is applied to last year's \$4.1bn revenues) and for tourism (perhaps \$500-\$700mn if we assume a near-total stop of tourist inflows for the remainder of the fiscal year)[6, 7]. Imports will tend to decline when FDI declines, consumer demand declines, and factory activity declines. If the drop in oil prices continues for the next year, it should save roughly \$1 billion or more in imports (given last year's \$2.6 billion fuel import cost and global oil prices that are less than half of last year's levels, i.e. \$26 per barrel for Brent crude vs \$50-60 last year). [8]

The Federal Ministry of Health confirmed a coronavirus disease (COVID-19) case in Addis Ababa, Ethiopia, on March 13, 2020. On April 22, 2020, the first COVID-19 virus confirmed case was reported in a far regional state; the case is a 22-year-old guy from Gewene woreda who has no prior international travel history. Nonetheless, on May 6, 2020, this confirmed case was bumped up to 9 people with no death or recovery record. Afar regional state is one of the most severe regional states in Ethiopia compare to the remaining one. This is because: - the geographical demarcation is located to the border of Djibouti, which makes the virus easily

transported to the state from Djibouti, the most elongated and highly traffic road (from Addis Ababa to Djibouti) passing in this region, this is also its own contribution for the virus transmission and the way of life of almost all societies are agro-pastoral, this makes difficult to mitigated and control the virus to the societies. Therefore, under this study we were try to analysis social welfare and trade effect of COVID-19 on the society of the regional state by employing panel data analysis.

Studies were conducted on the effect/impact of COVID-19. For instance: [4, 7-17]. However they are concentrated only on only the macroeconomic impact of epidemic disease, [6, 18] also investigated on the socio-economic and welfare effect of COVID-19. Notwithstanding, most of the papers including the above one were mainly focused on the macroeconomics (like GDP, inflation, foreign exchange, balance of payment) effect of epidemic disease (like COVID-19), they did not give in sight on the effect of epidemic disease on intra and inter-regional trade. In addition to this, most of the papers were investigated on Asia and Europe, they were not conducted a study of COVID-19 and it implication on the economy under regional level of the given country. Therefore, this paper conduction investigation of the effect of COVID-19 on regional trade in case of afar regional state (evidenced panel data analysis) by considering the above research's gap and attempt to fill such research's gap. The general objective of this study was analysis effect of COVID-19 on trade in case of Afar regional state by addressing its specific objectives like:- to sort-out the determinants of supply and demand of basic agricultural commodities, to analysis the consequence of COVID-19 on supply of basic agricultural products, to examine the effect of COVID-19 on demand of basic agricultural commodities.

## 2. Methodology

### 2.1. Data Type and Sources

Both primary and secondary data will used for this study. Primary data will be principally employed, which is collected from sample representative of the society from Asayta, Dubti, Awash and Semera-logia through questionnaires. Secondary data sources are also governmental and non-governmental institutions including both published and unpublished documents like Afar bureau of health, Ministry of health, and online from worldometer website, WHO, agricultural bureau at regional and district level and other relevant information sources were used.

### 2.2. Sampling Technique and Sample Size

In this study the researchers was employee two-stage sampling technique. In the first stage, from all major city of the region site Asayta, Dubti, Awash and samara-logia was selected by using purposive sampling technique. The purposive selection was based on total population, severity of COVID-19 virus mainly from Djibouti and Addis Ababa. In the second stage, we were simple random sampling to select the sample of the study

with the help of Cochran sample size determination techniques. In addition to the households we were collected data from regional agent, wholesalers, retails, and direct consumers to analyze the effect of COVID-19 on regional trade.

### 2.3. Method of Data Analysis

Descriptive statistics and econometric models were employed to achieve the objective of the study. The descriptive statistics includes means, standard deviation, minimum, maximum, frequencies and percentage and in the econometric analyses use Social Welfare Function (SWF) to evaluation the effect of COVID-19 on trade with the help of panel data analysis. The sample size of individuals was determined by Cochran formula of calculating sample size. Cochran formula allows you to calculate an ideal sample size given a desired level of precision, desired confidence level, and the estimated proportion of the attribute present in the population. Cochran's formula is considered especially appropriate in situations with large and unknown populations. A sample of any given size provides more information about a smaller population than a larger one, so there's a 'correction' through which the number given by Cochran's formula can be reduced if the whole population is relatively small.

The Cochran formula is:

$$n_0 = \frac{Z^2 pq}{e^2} \quad (1)$$

Where

$n_0$ : The sample size.

$Z^2$ : The normal curve that cuts off an area  $\alpha$  at the tails ( $1 - \alpha$  equals the desired confidence level).

$p$ : The (estimated) proportion of the population which has the attribute in question.

$q$ :  $1 - p$ .

$e^2$ : The desired level of precision (i.e. the margin of error).

$$n_0 = \frac{(1.645)^2 (0.5)(0.5)}{0.075^2} = 120.2 \approx 120$$

| Sample towns | Sampled number of population |      |
|--------------|------------------------------|------|
|              | Number                       | %    |
| Asayita      | 30                           | 0.25 |
| Semera-logia | 36                           | 0.3  |
| Awash        | 30                           | 0.25 |
| Dubti        | 24                           | 0.2  |
| Total        | 120                          | 100  |

#### Model Specification

With panel, the most commonly estimated models are probably fixed effects and random effects models. Fixed effects (FE) models control for or partial out, the effects of time-invariant variables with time-invariant effects (rid of the unobserved heterogeneity). This is true whether the variable is explicitly measured or not. How it does exactly so varies by the statistical technique being used. In addition the fixed effects model is simply a linear regression model in which the intercept terms only vary over the individual units [19].

Random effects (RE) models: another popular approach is to use random effects models. Linear Random effects models are estimated via Generalized Least Squares (GLS). If there are no omitted variables (or if the omitted variables are uncorrelated with the variables that are in the model), in addition no unobserved heterogeneity then a random effects model is preferable to fixed effects because (a) the effects of time-invariant variables can be estimated, rather than just controlled for, and (b) standard errors of estimates tend to be smaller. However, if relevant time-invariant variables (unobserved heterogeneity) have been omitted from the model, coefficients may be biased [19].

In order to address the effect of COVID-19 on trade by using the following methods:-

*Fixed effect model for demand analysis (Eq 2)*

$$DD_{it} = \alpha_i + \alpha_{it}NCV_{it} + \alpha_{it}ND_{it} + \alpha_{it}TB_{it} + \alpha_{it}AG_{it} + \alpha_{it}Y_{it} + e_{it} \quad (2)$$

Where

$\alpha_i$ : Intercept for each household;

$NCV$ : Number of COVID-19 victim;

$ND$ : Number of days;

$TB$ : Transportation ban;

$Y$ : Income of consumer;

$e$ : Error term;

$t$ : Number months;

$i$ : Commodities;

$DD$ : Quantity of demand in kilogram.

*Random effect model for demand analysis (Eq 3)*

$$DD_{it} = u_t + \alpha_{it}NCV_{it} + \alpha_{it}ND_{it} + \alpha_{it}TB_{it} + \alpha_{it}AG_{it} + \alpha_{it}G_{it} + \alpha_{it}FS_{it} + \alpha_{it}Y_{it} + \alpha_i + e_{it} \quad (3)$$

Where

$\alpha_i$ : Between household error term;

$e_{it}$ : Within household error term;

$u_t$ : Intercept for each months.

*FE model for supply analysis (Eq 4)*

$$SS_{it} = \alpha_i + \alpha_{it}NCV_{it} + \alpha_{it}ND_{it} + \alpha_{it}TB_{it} + \alpha_{it}AG_{it} + \alpha_{it}G_{it} + \alpha_{it}FS_{it} + \alpha_{it}CP_{it} + e_{it} \quad (4)$$

Where

$SS_{it}$ : Quantity of supply in kilogram;

$CP$ : Cost of Production.

*RE Model for supply analysis (Eq 5)*

$$SS_{it} = u_t + \alpha_{it}NCV_{it} + \alpha_{it}ND_{it} + \alpha_{it}TB_{it} + \alpha_{it}AG_{it} + \alpha_{it}G_{it} + \alpha_{it}FS_{it} + \alpha_{it}CP_{it} + \alpha_i + e_{it} \quad (5)$$

### 3. Results and Discussion

#### 3.1. Demographic Characteristics of the Sample Households

The average household members that live in one house for

the sample households were about 4 persons that ranging between 1 and 10 persons. The average age of the sample household heads was 39.13 years with maximum of 75 and minimum of 18 years old. This showed that the mean ages of the sampled households were within the range of economically active age and they were more energetic (see Table 1).

*Table 1. Households Demographic Characteristics.*

| Variables       | Mean  | Standard Deviation | Minimum | Maximum | Correlation coefficient |
|-----------------|-------|--------------------|---------|---------|-------------------------|
| Household size  | 3.94  | 2.21               | 1       | 10      | -0.0114                 |
| Age             | 39.13 | 12.44              | 18      | 75      | -0.0356                 |
| Education level | 4.58  | 4.25               | 0       | 15      | 0.2873***               |

  

| Characteristics | Frequency | Percent | T/F-Value |
|-----------------|-----------|---------|-----------|
| Sex             | Female    | 73      | 15.21     |
|                 | Male      | 407     |           |
| Marital Status  | Married   | 304     | 63.33     |
|                 | Single    | 112     |           |
|                 | Divorced  | 64      |           |
|                 | Widowed   | 0       |           |
|                 | Total     | 480     |           |

Source: Own computation (2020) \*\*\*, \*\*, \* Indicates level of significant at 1%, 5% and 10%.

The mean education level of the sample household in the study area was 4.58 ranging from 0 to first degree. The above table revealed that the mean educational levels of the sample household were very low. The correlation between educational level of the household and income of the households was significant positively at 1 percent probability level. Sample respondents were composed of both male and female household heads. Out of the total sampled household head about 84.79% were male headed and the remaining 15.21% were female headed households. From the sample households in the study area majority of them (that is about 63.33%) were married, 23.33% were single, where as 13.33% were divorced and none of them were widowed according to table below. F-test was employed to depict that

there was association between marital status of the respondents and their level of income (see Table 1).

#### 3.2. Types of Economic Sector and Source of Income

Sample respondents were engaged in three basic economics sectors, from those respondents most of them were participation in service delivering sector, which were account 69.79% of the total respondents. The remaining respondents were also participated in agricultural and industry sector, which were 15.83% and 14.28% of the total sample respondents, respectively. F-test was employed to depict that there was association between types of economic sector of the defendants and their income level of (see Table 2).

*Table 2. Economic Sector and Source of Income.*

| Characteristics  | Frequency           | Percent |       |
|------------------|---------------------|---------|-------|
| Source of Income | Self-employee       | 392     | 81.67 |
|                  | Formal wage         | 144     | 30    |
|                  | Remittance          | 160     | 33.33 |
|                  | Non-formal wage     | 172     | 35.83 |
|                  | Rent                | 52      | 10.83 |
|                  | Agricultural Income | 240     | 50.00 |
| Economic sector  | Agriculture         | 76      | 15.83 |
|                  | Service             | 335     | 69.79 |
|                  | Industry            | 69      | 14.38 |
|                  | Total               | 480     | 100   |

Source: Own computation (2020).

### 3.3. Income Trends of Sample Respondents

As we have seen below table, income trends of many sample households decreased due to COVID-19 epidemic disease, which was amounted that 81.67% of the sample household's incomes were decrease because of COVID-19. From the total sample households 14.17 % were increasing their income and the remaining 4.17% were does not change their income due to COVID-19. This may be due to that, most of the households were participating in service sector and self-employee source of income. According to World Bank report on 2020, the service sector was dwindled by 38% due to COVID-19 epidemic. Therefore, economic activities in the service sector and income of self-employee were highly affected by such epidemic disease compared to the other sectors and source of income. However, the income of some households were not decreased unless it was not affected or increased, this also may be the cause of, there was opportunistic entrepreneurship in the market due to COVID-19. This also creates additional income for thus opportunistic entrepreneurs. In a line with these, the income of some households also not affected by COVID-19, this was the case that, the income source of such households were from formal wage and rent, therefore such income source were not affected by such epidemic disease (see Table 3).

**Table 3.** Income Trends of Sample Respondents.

| Variables     |          | Frequency | Percent | F-value |
|---------------|----------|-----------|---------|---------|
| Income Trends | Decrease | 392       | 81.67   | 1.86    |
|               | Constant | 20        | 4.17    |         |
|               | Increase | 68        | 14.17   |         |
|               | Total    | 480       | 100     |         |

Source: Own computation (2020).

In Asayita Woreda income sources can be broadly divided in two: agricultural income (livestock rearing and crop production and non-farm income)[20]. In general in this study six different income sources for the households are identified such as, farm income, non- formal wage-employment, formal wage- employment, self -employment, remittance income and rent income. This result is agreed with the finding of [21].

From the total sample households 81.67% of them were received their income from self-employee and 35.83 and 33.33 of sample household also emanated their income from non-formal wage and remittance respectively. Around half of the sampled population income generated from agriculture sector. The remaining sample households also acquired their income from formal wage and rent, which was accounted that 30% and 10.83% sample households respectively.

### 3.4. Expenditure of the Sample Households

The total expenditure of the total sample households were goes to food and food related items, which were accounts for 51% of their total expenditure to food and food related items. Expenditure for service delivery like transportation, barberry, shoe shine and etc. was accounted for 12% of their total expenditure. Some sample households were not owner of some properties; therefore they must have played some amount of money as rent, therefore, they had payed 10% their total monthly expenditure to rent. Utility expense and goods (excluding food items) accounts 6% and 7% of their total monthly expenditure of the sample households, respectively. After making expenditure to all items there might be left some amount of birr, which was as means of saving to the depositor. Expenditure for saving was 14% of total household expenditure (see Table 4).

**Table 4.** Source, Percentage Share and Average Growth Rate of Sample Household's Expenditure.

| Total Expenditure of sample households/individuals in Birr | Total expenditure amount in birr (ETB) |          |        |         | Average growth rate of total expenditure | Average percentage share of expenditure from the total income |
|--|--|----------|--------|---------|--|---|
|  | March 13                               | April 13 | May 13 | June 13 |  |   |
| Food and food related items                                | 268368                                 | 295205   | 336533 | 390379  | 13.3%                                    | 51%   |
| Service  | 63145                                  | 68828    | 81217  | 97461   | 15.7%                                    | 12%   |
| Utilities  | 36835                                  | 36835    | 36835  | 36835   | 0.0%                                     | 7%  |
| Rent   | 52621                                  | 52621    | 52621  | 52621   | 0.0%                                     | 10%   |
| Saving   | 73670                                  | 67776    | 59643  | 51889   | -11.7%                                   | 14%   |
| Goods ( exclude food items)                                | 31573                                  | 33152    | 36798  | 41582   | 9.7%                                     | 6%  |
| Total  | 526212                                 | 554417   | 603647 | 670767  |  | 100%  |

Source: Own computation (2020).

COVID-19 epidemic has its own effect on social, economic and psychological in the world generally and in Ethiopia Afar region particularly. From the finding of our study from March 13, 2020 to June 13, 2020 the overall expenditure of households had significant changes, except expenditure on utilities and rent. From the above table, food and food related items and service expenditure were relatively significant increase after the COVID-19 epidemic. The total expenditure on food and food related items were increased by 13.3% per month on average after COVID-19 epidemic. This may be due

to, difficulty in distribution and transportation of food and food related goods and decline in production capabilities.

Total expenditure on the side of service delivering activities was increased by 15.7% on average per month. Which was witnessed by specifically increased the cost of transportation. Expenditure on goods (excluding food related items) like expenditure on cloth, shoe, kitchen materials, construction materials and etc. had increased by 9.7% on average per month, this was also due to the problems of distribution and transportation of such products (transportation ban).

Notwithstanding, sample household expenditure on rent (like expenditure properties rent) and utilities (like expenditure mobile air time and internet packages, water and electricity bill) hadn't a significant effect due to COVID-19 epidemic. Finally the saving behaviors of households were hurt by such disease, which was decreased by 11.7% per month on average from the total household expenditure for saving.

In general, due to COVID-19 epidemic disease expenditure on food and food related items and expenditure on service were increased significantly relative to other item of expenditure, plus more than half of total expenditure was accounted for food and food related items. Therefore, the wellbeing as well as the welfare of sample households was highly affected by COVID-19 epidemic disease (see Table 4).

### 3.5. Econometric Result

Other objective of the study was analysis the effect of

COVID-19 on trade of afar regional state. The effect of COVID-19 on trade was investigated using linear panel data analysis. We classified the explanatory variables as policy variables (number of COVID victims, number of days, transportation ban) and control variables while analyzing the effect of COVID-19 on commerce (cost of production, gender, age, and educational level, income of household and family size). Accordingly, variables assumed to have influence on trade in different contexts were tested in the model and six out of seven variables were found to be significant in supply and demand equation.. Among variables fitted into the supply fixed effect model:- number of COVID-19 victims, number of days, transportation ban, cost of production, age, gender, educational level significant. On the side of demand fixed effect model: number of COVID-19 victims, number of days, transportation ban, household income, family size gender and gender were significant (see Table 5).

**Table 5.** Fixed Effect Estimation Result for Supply And Demand Equations.

| Fixed effect model for supply equation |          |               |        | Fixed effect model for demand equation |          |               |        |
|--|----------|---------------|--------|--|----------|---------------|--------|
| supply                                 | Coef     | Std. Err.     |        | demand                                 | Coef.    | Std. Err.     |        |
| Number of COVID victims                | -0.54*   | -0.28         |        | Number of COVID victims                | -0.26**  | -0.13         |        |
| Number of days                         | -0.32**  | -0.15         |        | Number of days                         | -0.14*   | -0.07         |        |
| Transportation ban                     | -0.41*** | -0.10         |        | Transportation ban                     | 0.08**   | 0.04          |        |
| Cost of production                     | -0.65*** | -0.16         |        | Income of household                    | 0.63***  | 0.16          |        |
| Age                                    | 0.04*    | 0.02          |        | Age                                    | 0.00     | -0.01         |        |
| Education level                        | 0.23***  | 0.06          |        | Family size                            | 0.29**   | 0.14          |        |
| Gender                                 | 0.37     | 0.42          |        | Gender                                 | 0.05**   | 0.02          |        |
| Constant                               | 2889.51  | 53509.52      |        | Constant                               | 0.78     | 13.43         |        |
| Statistical variables                  |          |               |        |  |          |               |        |
| sigma_u                                | 7.4962   | F(6,354)      | 180.2  | sigma_u                                | 1259.000 | F(6,354)      | 78.23  |
| sigma_e                                | 0.3431   | Prob > chi2   | 0.0000 | sigma_e                                | 58.650   | Prob > chi2   | 0.0000 |
| Rho                                    | 0.9979   | Number of obs | 480    | rho                                    | 0.998    | Number of obs | 480    |

Source: Model output (2020)

\*\*\*, \*\*, \* refers to 1%, 5% and 10% level of significance, respectively.

Number of COVID-19 victims: The model reveals that number of COVID-19 victim has a significantly negative relationship with supply and demand of basic agricultural commodities at 10% and 5% probability level, respectively. As the number of COVID-19 victims increased by one person, the supply and demand of basic agricultural commodities decreased by 54% and by 28% per month respectively. This may be due to the fact that, as the number of COVID-19 victims increase the government takes a measurement to restrict the movement of labor, which makes decreasing labor additional income and ban the distribution of goods and service which diminishing the quantity supplied and increase price of the product, in addition the peoples may be frustrated and not willing to move place to place and work. Therefore, these factors may have its own contribution to decrease both supply and demand of basic agricultural products.

Number of days: The result also showed as there was a negative relationship between supply and number of days starting from March<sup>1</sup> 13, 2020 plus demand and number of

days starting from March 13, 2020 at 5% probability level respectively. When the number of days increased by one more days with COVID-19 epidemic, the supply and demand of basic agricultural commodities decreased by 32% and by 14% per month respectively. This may be due to, if the number of days with COVID-19 epidemic increase, there were a caused for shrinkage of both intra and inter regional trade, investment, tourism, manufacturing sector and a little bit decreasing in agricultural sector production. Such factors had their own contribution to decrease the supply and demand of basic agricultural commodities (see Table 1).

Transportation ban: This variable affects supply negatively and demands positively in significantly at 5% probability level respectively. Thus, keeping other thing remain constant; the probability of the level of supply decreased by 41% and demand increased by 8% when there was transportation ban compared to there was not transportation ban. As we have seen before, from the total sampled households 81.67% and 35.83% of their income were emanated from self-employee and non-formal (daily labor) wage, in such a way such activities required moving place to place to work. However, due to transportation ban it was difficult to do such activities as usual; therefore, at the end of the day the income of

<sup>1</sup> The first day that the federal ministry of health Ethiopia has approved a coronavirus disease (COVID-19) case.

households will be decreased, this again makes the expenditure of sample household leads to decrease. In Afar regional state most of agricultural products were imported from neighbors region, however due to transportation ban in the region the distribution and transportation of agricultural product were difficult, and finally this makes diminishing the supply of agricultural products.

**Cost of production:** The cost of production positively affected the supply of commodities at 1% levels of significance. *Ceteris paribus*, cost of production increased by 1 birr, the supplies of agricultural commodities were decreased by 65%. This was also due to the reason that if the cost of production increased, the producers were not enthusiastic to produced more and more of agricultural commodities, finally this revealed that the decrement in the supply of agricultural commodities.

**Income of household:** As expected, the income of households was significant at 1 percent probability level, and has a positive relationship with the demand of agricultural commodities. This implies as the income of household's increases by one birr, the demand of agricultural commodities decreased by 63 percent, *ceteris paribus*. This is because, consumption is a function of income or as income of households increased the demand on the product also increased.

**Age:** The model reveals that age of household head has a significantly positive relationship with the supply of agricultural commodities at 10 % probability level. The supply of basic agricultural commodities increases by 4% as the age of a household head increases by one year keeping the other variables constant. The possible explanation for such positive association is that an older household head devotes his/her time on income generating activities like farming and non -farm income sources compared to young households. Young people spend much time in towns and prefer urban life than the rural for a number of reasons. Additionally, as household age increases, one can acquire more knowledge and experience becoming successful in exploiting these experiences.

**Education level:** This variable affects the supply of agricultural commodities positively and significantly at 5 percent probability level. As year of schooling increase by one year, the supply of agricultural commodities increased by 23%. When the educational status of the households increased, they built know how, experience and skill in order to helps them to produce more and supply more to the market. As a result, when the educational level of households increased, will leads to increase the volume of agricultural commodities.

**Family size:** Besides, the coefficient of family size also shows a positive association between family size and demand of agricultural commodities. This suggests that, when the family size changed by a person, the total demand on agricultural commodities were increased by 29%. When the family member increased by one more individual, their consumption quantity also increased, in turn these also responsible factors for increasing the demand of agricultural commodities.

**Gender:** It was found that male headship has a positive and

significant effect on demand of agricultural commodities at 5 percent probability level. Thus, keeping other thing remain constant; the demand of agricultural commodities by 5 % when the household head is male (male headed households). In the main, evidenced from the above finding supply and demand of trade pattern was badly affected by COVID-19 epidemic disease. That was, the supply of basic agricultural product was decreasing over months on average, whereas the demand of such agricultural commodities simultaneously increased due to COVID-19 epidemic. At the end of the day the amalgamation of such problems had its own contribution to hurt regional trade.

## 4. Conclusions and Policy Implications

### 4.1. Conclusions

This study attempts to investigate effect of COVID-19 on social welfare and trade in case of Afar Regional State using the sample data collected from 120 randomly selected households from three Samara-logia, Asyaita, Dubti and Awash towns, Afar region Ethiopia. Both descriptive analysis and econometric estimation (panel data analysis) results have been used. The descriptive analysis revealed that around 70% of sampled household's source of income was served in service delivering sector of the economy and the remaining 16% and 14% of households were employed in agricultural and industry sectors respectively. The main source of income of households were generated from self-employee, agriculture income and non-formal wage, accounted for 81.67%, 50% and 35.83% of total income were stemmed from those source respectively.

Due to COVID-19 disease 81% of household's income was decreased, 14% of household's income increased and 5% of household's income remain the same after such disease. Total expenditure items of sampled households were changed after COVID-19 i.e. expenditure for food & food items and service delivering were significantly increased compared to the remaining expenditure items, which were constitutes around 13% and 15% increment per months. The econometrics model was based on panel data analysis from February 13, 2020 to June 13, 2020 to investigate the effect of COVID-19 on social welfare and trade in the case of afar regional stated. After conducting necessary pre and post estimation test, we had found the following results. The basic policy variables that was, increase number of COVID-19 victim, increase number of days with COVID-19 disease, types of economic sectors and if there is transportation ban were decreased income and increased expenditure of sampled household. These will have its own adverse effect on the wellbeing and welfare of the society by: increasing the cost of living, unable to fulfill their psychological (basic needs) and finally they will suffer absolute poverty in general. Whereas, such policy variables also had its own adverse effect on reginal trade by decreasing the supply and increasing the demand of basic agricultural commodities per a given months. The control variables of panel data model

also its own significant effect trade i.e. the supply of basic agricultural commodities also affected positively by age and educational level of the household and negatively by cost of production, and income of households, sex and family size had positive and significant effect on demand of basic agricultural commodities (see Table 5).

#### 4.2. Recommendation

Considering regional experience, econometric and descriptive results, this study recommends that the government and the concerned policy maker could undertake the following policy actions for adversative effect of COVID-19 on social welfare and trade. The government should give more attention to service sector (to protect the rate of unemployment) and supported those self-employee and daily laborer in a means of financial and material needs, responsible bodies should made encourage investment on food and food items production, processing and distribution specially in the regional state like tax free, provided land, electricity, water, agricultural inputs, access to credit and as long as public transportation to the society; the government and responsible bodies should makes awareness, provide mitigation and health materials kits, prepared well organized quarantines to keep the feast of the disease, the healthiness status of the victims and increased the numbers of cure. In addition, the regional government should not ban all in all aspect of the transportation, especially the distributing and trade of food and foods items, place alternative mechanism to fill potential trade gaps.

## References

- [1] Hu, Z., et al., Artificial intelligence forecasting of covid-19 in china. arXiv preprint arXiv: 2002.07112, 2020.
- [2] Wu, F., et al., A new coronavirus associated with human respiratory disease in China. *Nature*, 2020. 579 (7798): p. 265-269.
- [3] Barro, R. J., J. F. Ursúa, and J. Weng, The coronavirus and the great influenza pandemic: Lessons from the "spanish flu" for the coronavirus's potential effects on mortality and economic activity. 2020, National Bureau of Economic Research.
- [4] Ethiopia, U., Socio-economic impacts of COVID-19 Update-14th May 2020. Update, 2020.
- [5] WHO, W., WHO Director-General's opening remarks at the media briefing on COVID-19. [www.who.int](http://www.who.int), 2020.
- [6] Goshu, D., et al., Economic and welfare effects of COVID-19 and responses in Ethiopia: initial insights. 2020.
- [7] Kassegn, A. and E. Endris, Review on socio-economic impacts of 'Triple Threats' of COVID-19, desert locusts, and floods in East Africa: Evidence from Ethiopia. *Cogent Social Sciences*, 2021. 7 (1): p. 1885122.
- [8] McKibbin, W. and R. Fernando, The global macroeconomic impacts of COVID-19: Seven scenarios. *Asian Economic Papers*, 2021. 20 (2): p. 1-30.
- [9] Annex, I. and V. I. Fiches, Mitigating the socio-economic impacts of COVID-19 in Ethiopia, with a focus on vulnerable groups.
- [10] Beyene, L. M., T. Ferede, and G. Diriba, The economywide impact of the COVID-19 in Ethiopia: Policy and Recovery options. 2020.
- [11] Nechifor, V., et al., COVID-19: socioeconomic impacts and recovery in Ethiopia. 2020: Publications Office of the European Union.
- [12] Asegie, A. M., S. T. Adisalem, and A. A. Eshetu, The effects of COVID-19 on livelihoods of rural households: South Wollo and Oromia Zones, Ethiopia. *Heliyon*, 2021. 7 (12): p. e08550.
- [13] Harris, D., et al., The Impact of COVID-19 in Ethiopia: Policy Brief. 2021.
- [14] Barbero, J., J. J. de Lucio, and E. Rodríguez-Crespo, Effects of COVID-19 on trade flows: Measuring their impact through government policy responses. *PloS one*, 2021. 16 (10): p. e0258356.
- [15] Kumari, M. and N. Bharti, Linkages between trade facilitation and governance: Relevance for post-COVID-19 trade strategy. *Millennial Asia*, 2021. 12 (2): p. 162-189.
- [16] Liu, X., E. Ornelas, and H. Shi, The trade impact of the Covid-19 pandemic. 2021.
- [17] Hayakawa, K. and H. Mukunoki, The impact of COVID-19 on international trade: Evidence from the first shock. *Journal of the Japanese and International Economies*, 2021. 60: p. 101135.
- [18] Baye, K., COVID-19 prevention measures in Ethiopia: current realities and prospects. Vol. 141. 2020: Intl Food Policy Res Inst.
- [19] Wooldridge, J. M., *Introductory econometrics: A modern approach*. 2015: Cengage learning.
- [20] Asfaw, D. M., Analysis of technical efficiency of smallholder tomato producers in Asaita district, Afar National Regional State, Ethiopia. *PloS one*, 2021. 16 (9): p. e0257366.
- [21] Adem, M. and F. Tesafa, Intensity of income diversification among small-holder farmers in Asayita Woreda, Afar Region, Ethiopia. *Cogent Economics & Finance*, 2020. 8 (1): p. 1759394.