

Ethiopian coffee and investing through data.

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Introduction

My research started off when me and my friend wanted to create a business plan and research. Going into it we wanted to invest in our home country and wanted to research the markets. As we spent about two weeks just looking through different websites and groups. Realizing there is no obvious path we could follow to learn and understand the markets in our country. If we ever were to acquire the right funds, we would not have the ability to set a up a solid business idea. Realizing that these situations are the same for other Ethiopian diasporas that live in western nations.

In that realization I wanted to spend a couple weeks looking at the markets and analyze what exactly is happening in the markets. Thus, that is what my research was about this summer. I went through different approaches that I could make to start my research. My initial idea was to start collecting data from brokers and see what the market looks like in the past few years. C-4 investment that has occurred in different parts of the country in different parts of industry and understand it. What countries should I look at to determine if an area requires investing for specific item. My goal was from this understanding I could create clear and guided way to invest in a certain field in a developing nation. Finally, being able to share this guide to invest in different areas to diasporas of developing nations.

The main ideas starting with collecting data and information of different fields of investment. Making that data clear and understandable to the day-to-day person of different backgrounds. Making it very accessible to people using websites and applications that are easy to use. The most difficult part of my research being that it very difficult to come by data that is useful. There hasn't been much research or study to create such a software and to collect the data like this. So, I had to choose a product that is very well researched and plenty of data has been collected of that product. I had already decided that I could like the research to be about my home country which was Ethiopia, and the product that was well studied which if coffee. Coffee is the biggest trade product in Ethiopia. The coffee industry in Ethiopia is the driving force of the country's economy, socio-cultural, and spiritual life of the people. The livelihood of 25 percent of the country's population is directly or indirectly dependent on the coffee value chain will remain so in the years to come. Post Addis estimates Ethiopia's coffee production for MY 2022/23 (Oct-Sep) to reach 8.27 million 60 kg bags (496,200 MT). According to the USDA, which is clearly a big part of the Ethiopian people.

So, I decided that the product that would be best to try applying to my research was coffee. Information can still be very lacking as Ethiopia is still very much a developing with a lack of data. So, finding the best resources of data was crucial to the search, and of course, deciding what approaches I should take to understand the data that I find. After going through many government and private organization websites, I was able to find the data on Ethiopia's coffee trade through a government/Private company that sells coffee like stocks. It is known as ECX or

Ethiopian Commodity Exchange. The Ethiopia Commodity Exchange (ECX) was established to create opportunities for growth in the country's agricultural sector. It is a national multi-commodity exchange in Ethiopia that brings together buyers and sellers of agricultural commodities. Read more on <https://commodity.com/trading/exchanges/ethiopia/>.

Seeing all the bases for the research I will move on to explain what we need to do to increase investment in developing nations. How we can inform diasporas on how to invests and where they can find that information. How to make the process much easier.

Literature review

We can start by talking about the data I collected from ECX to use in my research. To understand the markets of the Ethiopian coffee market I had to go to the biggest regulator, which is Ethiopian commodity Exchange. The contains information about the coffee being auctioned of to private organizations. These organizations could be national coffee exporters that go to the US and Europe, coffee distributors in the country, as well as just coffee shop owners. The data collected contains information about daily prices of different coffee brands from different warehouses. I will just be sharing a part of the data so that you can get an idea of what that looks like as well as the locations of these different warehouses. I so for context, these warehouses are in different parts of the country and are given codes to collect from farmers in the area. Are most of these warehouses are located, and the highest coffee, producing regions of Ethiopia witches usually in the southern and eastern parts of the Ethiopian highlands.

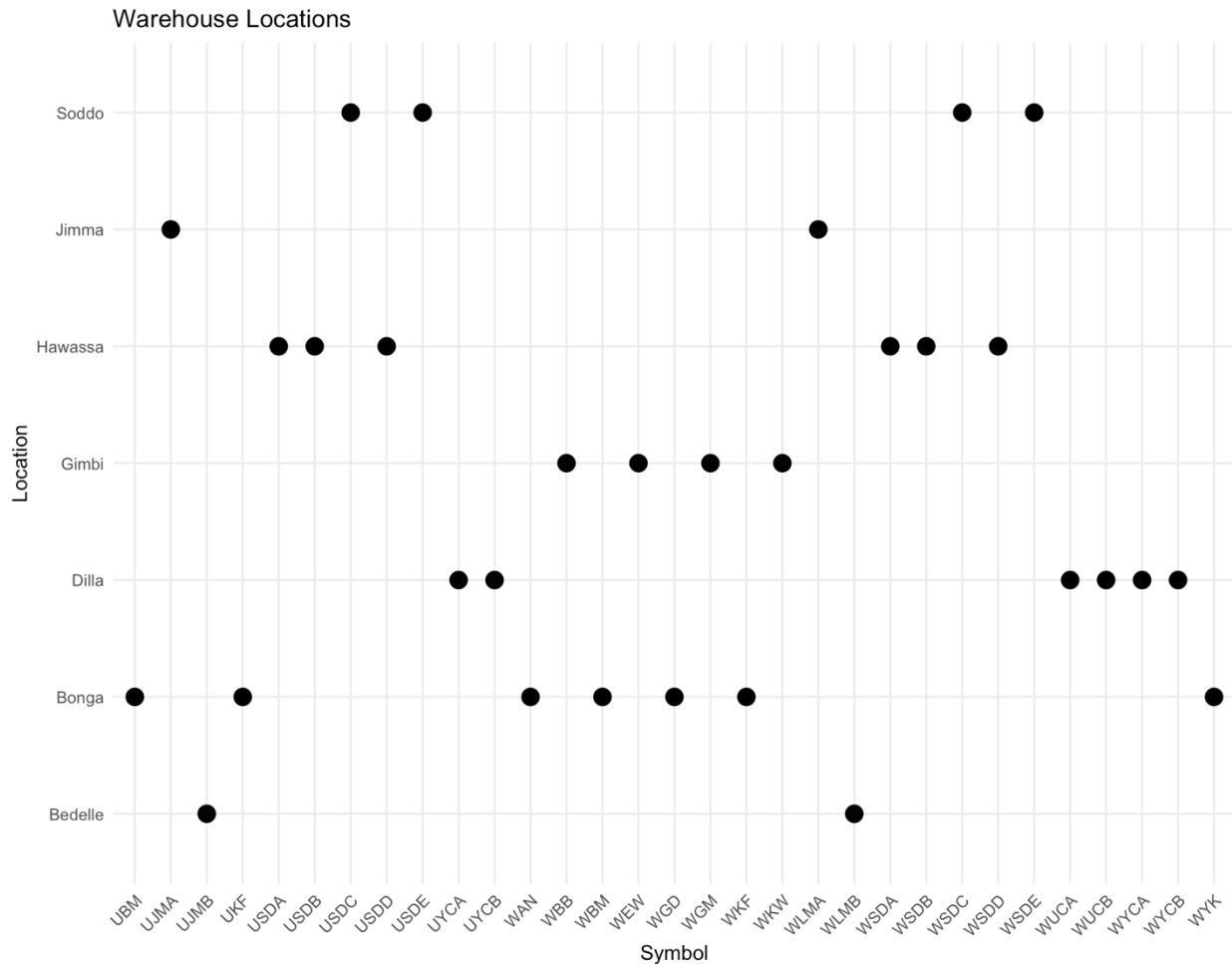


Figure 1: Warehouses of ECX and their location distribution.

This image has locations and symbols of the warehouses in those areas. So, what does this graph show us. One interpretation we can get from this is that a lot of the warehouses are in southern Ethiopia. The locations Jimma, Hawassa, Gimbi, Soddo are all from southern Ethiopia. To understand markets, we need to understand the areas and the community at large. I was able to collect the locations of these warehouses using contracts that ECX makes public. I wanted to understand what kind of demographic and social conditions are in these areas of high coffee production. Is there an educated population there to support growth in production,

efficiency, sustainability, and reliable operations management. These have huge factors in attracting investment and increasing the potential of industries like coffee. Also, what kind of geopolitical situations exist in the area that could affect any future investment opportunity. Wishing to understand all these conditions I have went through research from the USDA and other independent works of the past. The USDA report I referenced was published in 2022 by Abu Tefera. Ethiopia has very high exports of coffee. Primarily this coffee is exported to Germany, Saudi Arabia, US, Belgium, and Japan. Local consumption in MY 2021/22 is estimated to increase to 3.45 million bags (207,000 MT). Many coffee farmers are switching from growing coffee to khat for economic reasons. Ethiopia is in crisis recovery phase from the COVID-19 pandemic. Which shows the need for a change in methods of coffee production as well as better investment tactics in coffee economy. The paper also has very useful information of current coffee production as well as future forecast, which I will not be the focus of my project.

Forecasts or future projects from government are helpful for development but privatization is also very important. In June 2021, Ethiopia launched a state-of-the-art coffee training center to deliver modular and practice-based training that aims to enhance the sustainability and value chain in the country's coffee sector located in the premises of the Ethiopian Coffee and Tea Authority (ECTA) in Addis Ababa. While these kinds of moves from the government does a lot to help the industry, I believe that there is much more effort and dedication from private investors than government ones. There is also less corruption that might hold back efforts of development. From that understanding, it is better to encourage the development of the economy with investment of diasporas. Another type of source I have used

is understanding the use of technology in Ethiopia. What recourses have bigger economies in coffee have used to make their production better. Articles from the BBC and other research has shown that better quality coffee is produced with use of better fertilization techniques and harvesting methods. This can be a big area of investment as we will have to encourage the use of technology in the industry. Data Collection: We gathered data from the Ethiopian Commodity Exchange (ECX) on coffee trade, including key variables such as closing price, volume, and percentage change, spanning the years 2013 to 2019. Descriptive Statistics: We conducted descriptive statistics to gain an overview of the central tendency, variability, and distribution of the key variables, including closing price, volume, and percentage change. Time Series Analysis: To identify trends and patterns in closing prices and volume over time, we employed time series analysis techniques. This involved using line plots and time series decomposition to detect any seasonality or long-term trends. Price Change Analysis: We investigated the changes in closing prices for different warehouses over the years. This analysis included calculating yearly or monthly percentage changes in closing prices and visually representing them using bar charts or line plots. Supplementary Data: To complement our understanding of Ethiopia's coffee industry, we collected demographic information and use cases of different technologies in the sector from the USDA. This allowed us to compare Ethiopia's agricultural practices, specifically in coffee production, with those of Brazil. I did not go on to look at data about coffee production for Brazil but just used it to grow my understanding of the market beyond Ethiopia.

Methodology

I had data collected from Ethiopian commodity exchange and USDA which I used to understand the markets of Ethiopia. This method of analysis could be used to analyze another market in Ethiopia other than coffee. To clarify we do need more data and more methods to analyze them but as of right now I have done some basic analysis of the data. I will be listing some of the analytical work. Most of the analysis was done using R code in RStudio. Here is some of them.

Data Collection: We gathered data from the Ethiopian Commodity Exchange (ECX) on coffee trade, including key variables such as closing price, volume, and percentage change, spanning the years 2013 to 2019.

Descriptive Statistics: We conducted descriptive statistics to gain an overview of the central tendency, variability, and distribution of the key variables, including closing price, volume, and percentage change.

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1.1 INCREASE IN CLOSING PRICES

After completing the code and the analysis I have been able to create visuals where people can easily see the trend and understand what the coffee market has been like from 2013 to 2019 in Ethiopia. I was able to see monthly average closing prices for all the years 2013 to 2019. All of the trends showed upward trends in prices except for a couple months in between as a downward trend in 2016. The trends are expected to keep rising even past 2023. This trend could be because of many factors here are some of them: **Increasing Demand:** A consistent increase in coffee prices could suggest rising demand for Ethiopian coffee in both domestic and international markets. This heightened demand might be due to factors such as favorable quality, increased consumer interest, or expanding export opportunities. **Market Confidence:** An upward price trend often reflects market confidence in the product. If investors and traders perceive Ethiopian coffee as a reliable and potentially profitable investment, they may be willing to pay higher prices for it.

Improved Quality: I was not able to find information on change in quality of coffee.

Coffee grading determines in the coffee is exported or used locally so with better use of technology quality can be improved but as of now information on quality trends. Also, coffee quality is a significant driver of pricing. If Ethiopian coffee producers have been focusing on improving the quality of their beans, this could lead to higher prices. Quality improvements might involve better farming practices, processing methods, or adherence to quality standards.

1.2 Average Closing prices in Warehouses.

Understanding the overall performance of different warehouses that ECX manages thought the country is also very import. Understanding how different warehouses are performing. I wish to understand how these warehouses work with the local farmers that they collect their coffee from. As understanding how they work with the community and how you could replicate and improve their methods is also very important. I have analyzed the closing prices and the locations of these warehouse and hope to find data about the farmers in a future research project. The image below just shows the average monthly closing price for each warehouse of ECX. There are about 20 warehouses. Certain regions have slightly different coffee prices with highland Ethiopia coffee being preferred. The grading of coffee also has a huge impact of coffee. Better weather conditions in the highlands affect the number of defects in coffee. The classification is divided into so-called grades, or thresholds, and is laid down by national law based on number of defects allowed in a sample.

Grade	Number of defects
1	0-3
2	4-12
3	13-25

4	26-45
5	46-100
6	101-153

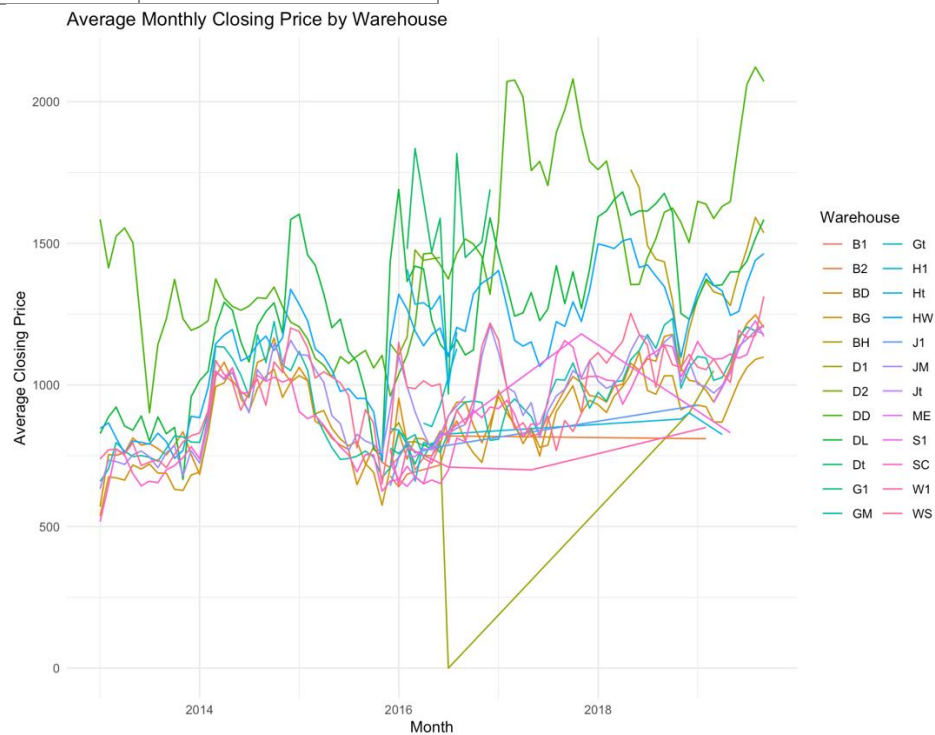


Figure 2: Average monthly closing prices

You can clearly see that there is an uptrend in prices and a huge difference in the prices of the coffee. Looking how the warehouses performance will help us understand where we could invest and how we invest. There is still the need for more data.

1.3 Locations

Locations of the warehouses were also very important to understand. See what different parts of the country had to offer for new investors. Most of these warehouses are located in the southern part of Ethiopia. Knowing these locations, we can start analyzing the demographics and land use, We can also look at factors like rain fall, regional stability and a labor forces available in that location.

1.4 Use of Technology in the Industry

The Use of technology in Agriculture plays a big roll in determining the continuous development of the industry. With the leading coffee producers like Brazil using modern methods in their agriculture. One very important example is the Use of satellite technology in monitoring what different farmlands need. Determining the types of fertilizer that each plot of land need to have optimal production. As Ethiopia does focus on organic coffee production, the use of fertilizers could nonessential but implementing the methods could be useful for pest control as well as irrigation system control. I was not able to find data about technology use in the country but this on its own shows the lack of modern agricultural practices.

Conclusion and Results

In conclusion, the power of data in shaping investment decisions and driving industry growth cannot be overstated. With access to relevant and current data, the path towards enhancing an industry of interest becomes clearer, and opportunities for investment become more apparent. As industries evolve and adapt in a dynamic global landscape, staying informed through data becomes paramount.

Furthermore, the need for comprehensive data extends beyond just market trends; it encompasses technology use, demographic insights, and local context. This multifaceted data approach equips investors with a holistic understanding of the opportunities and challenges within a given industry. To fully harness the potential of data-driven investments in developing nations, it is imperative to engage local government organizations in the data collection process. These collaborative efforts not only promote transparency and accountability but also serve as the catalyst for stimulating investment and fostering sustainable economic development within local communities. In essence, data becomes the bridge that connects investors, industries, and governments, forging a path towards progress and prosperity.

The next steps will be to create an open-source platform where I would be able to share this information and share understanding of the markets. But also, there is still a very big gap in the data available to study. So, fixing that is essential.

Sources

1. Ethiopian Commodity exchange. <https://www.ecx.com.et/>. Data and information was sourced from
2. Ethiopian Agriculture Authority. <https://www.eaa.gov.et/en/home/>
3. I have been able to easily collect coffee trade data of ECX from Kaggle. Ethiopian coffee trade.
<https://www.kaggle.com/datasets/khalidsultan/cdatasets>
4. Also some sources from the USDA studies of the
This is the link for the USAD file I used as a reference.
[https://apps.fas.usda.gov/newgainapi/api/Report/DownloadReportByFileName?fileName=Coffee%20Annual Addis%20Ababa Ethiopia ET2023-0014.pdf](https://apps.fas.usda.gov/newgainapi/api/Report/DownloadReportByFileName?fileName=Coffee%20Annual%20Addis%20Ababa%20Ethiopia%20ET2023-0014.pdf)
5. Coffee production in Brazil from the BBC. <https://www.bbc.com/news/business-62235741>