Vietnam Coffee Exports

Abstract

This comprehensive study explores the intricate dynamics of Vietnam's booming coffee industry, highlighting its significant impact on the nation's economy and cultural identity. Vietnam's coffee sector has not only thrived but achieved record-breaking exports. The empirical analysis, conducted through OLS regression models, investigates the influence of relative coffee prices between Vietnam and Brazil on Vietnam's coffee exports to key destinations—Germany, the U.S., and Japan from 2010 to 2022. The findings reveal nuanced patterns, emphasizing the competitive dynamics between the two major coffee-exporting nations. This study contributes crucial insights into the multifaceted factors shaping Vietnam's coffee exports, offering a deeper understanding of this thriving industry.

Introduction

Vietnam is the world’s second-largest coffee exporter. With coffee shipped to more than 80 countries and territories, it makes up 14.2% of the market share (Nguyen and Vo, 2021), just behind Brazil. Every year, Vietnam produces and exports roughly 30 million bags (green bean equivalent) (USDA, 2023) and has been continuing to grow rapidly. The main destinations of Vietnam's exports of coffee are Germany, the U.S., Russia, Italy, Japan, and Spain (General Statistic Office of Vietnam, 2023). This year has seen a historic peak in Vietnam's coffee exports, driven by the highest domestic and global prices in 15 years. The surge is a result of limited supply, depleted coffee reserves, and a significant uptick in the worldwide demand for Robusta (VietnamNews.vn, 2023), the bean that Vietnam is favorable to grow. This four-billion-dollar business is booming and has expanded exponentially based on favorable exchange rates and high export demand.

In light of rising competition with Brazil and significant global demand for coffee, how do relative prices between Vietnam and Brazil impact Vietnam's coffee exports? In trying to explain Vietnam's distribution of coffee export volume to different countries, we will look at the price of Brazilian coffee in each country. We expect the two to be negatively related, with higher Brazilian coffee prices encouraging demand for Vietnamese coffee. In this paper, we will describe the layout and dynamics of the world coffee market, including major drivers of supply and demand. A summary of our data will provide more context to Vietnam's export destination countries and the coffee competition between Vietnam and Brazil. OLS regression will seek to analyze the effect of relative coffee prices between Vietnam and Brazil and demand for Vietnamese coffee. From the regression analysis, we will derive conclusions from the results and give more implications for this question at hand.

Literature Review

Even during the global pandemic, Vietnam's coffee sector achieved a coffee export revenue exceeding $3 billion in 2021, constituting three percent of the nation's GDP and 10 percent of its agricultural exports (Vietnam Briefing, 2022). This shows how sought-after this commodity is even in an international emergency. With aspirations to enhance its coffee processing and producing industry, Vietnam anticipates that total exports will achieve $6 billion by the year 2030 (Vietnam Briefing, 2022).

The introduction of coffee to Vietnam dates back to 1857 when French colonialists brought the Arabica bean variety, realizing the conducive environmental and weather conditions in the central highlands. In 1908, they introduced the high-yield Robusta variety, cultivating it alongside Arabica. Post-1986, after the reunification of Vietnam, economic reforms facilitated increased privatization, and the government, recognizing coffee's potential, initiated state-funded

farms (BBC, 2014). Now, approximately 3 million individuals in Vietnam rely on the agricultural coffee industry for their livelihoods (Vietnam Briefing, 2022) - that is roughly 3% of the population. With that in mind, the coffee industry has helped Vietnam increase its GPD by 7% over the years (Nguyen and Vo, 2021) and is on the trajectory to increase that percentage even higher.

Not only that Vietnam's economy is driven by coffee, but it is also an important way of life in Vietnam. Coffee holds a special place in Vietnamese culture, being savored throughout the day—from the initial cup during breakfast to moments in meetings, dates, or social gatherings with friends and family. This uncomplicated beverage serves as the focal point of daily life in Vietnam. Surprisingly, statistics indicate that approximately 30-40% of the global population drinks coffee every day (International Coffee Organization, 2023), and over 2.25 billion cups of coffee are consumed in the world daily (British Coffee Association, 2021). When you put together the numbers, there is an extremely high desire for coffee in the world.

Empirical Specification & Data

$$\Delta\,\%Share\ of\ Vietnam\ Coffee\ Export\ =\ \beta_0 + \beta_1\ unit\ value\ of\ Vietnamese\ coffee + \beta_2\ unit\ value\ of\ Brazillian\ coffee\ + \beta_3\,\Delta\ inflation\ + \beta_4\,\Delta GDP\ +\ \beta_5 transportation\ cost\ +\ e$$

In this regression model specification, we want to investigate what affects Vietnam's coffee export market demand - how does the price of Brazilian coffee in the export destination of interest effect Vietnam's export volume there? We control for domestic economic conditions in export destination markets, including economic growth and inflation, and energy costs (i.e., proxy for transportation costs) in origin countries. Essentially, in simpler words, we are trying to look at why Vietnam might have sent more or less coffee to its exported country in 2010 and 2022 from the perspective of how expensive Vietnamese coffee is compared with Brazilian

coffee and how prices are of the overall economy in three main countries: Germany, the U.S., and Japan.

In this research, the *unit value* is determined by dividing the total value of coffee exports by the total tonnage, providing a proxy for domestic prices in destination countries. The Vietnamese coffee data was extracted from the General Statistics Office of Vietnam and Brazil's coffee data was collected from COMEX STAT. The *transportation cost* serves as an index for domestic energy costs, also taken from the General Statistics Office of Vietnam and the Central Bank of Brazil's management system. To maintain consistency and eliminate the impact of inflation, all prices are adjusted to a constant value in 2010 dollars, ensuring a standardized basis for comparison throughout the analysis. Inflation and GDP are values taken from the World Bank website for Germany, the U.S., and Japan. The independent variable, the *percent share of Vietnam's coffee exports,* is calculated by dividing the exported tons by one of the countries being measured by the total coffee exports from Vietnam.

Results

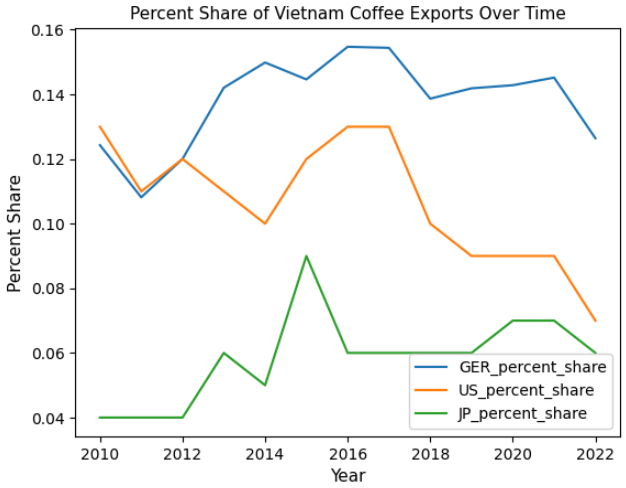


Figure 1. Percent of Vietnam Coffee Exports for Germany, United States, and Japan from 2010 to 2022

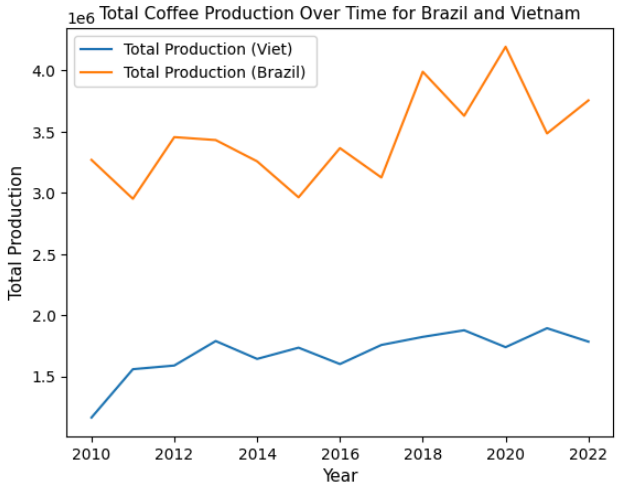


Figure 2. Vietnam and Brazil's Total Coffee Production from 2010 to 2022

Crucially, given our data trends over time in *Figure 1*, we must recognize how our true variable of interest shifts. Vietnam's share of exports by its three major trading partners diverges considerably. The US trade share declined while Germany and Japan showed resilience. We can see that Germany has been consistently importing the most coffee from Vietnam, and Japan is slowly increasing its shares in the Vietnam coffee exporting market. It is also interesting to note that in 2022, all three countries showed a slight decline in their exporting activities.

Figure 2 describes the total production trends for both Vietnam and Brazil coffee production. We can see that compared to Vietnam's level of production, Brazil exceeds that production level by a lot. According to the latest USDA report for the 2022/2023 cycle, Brazil makes up 37% of the global production, whereas Vietnam is only 17% (USDA, 2023). As mentioned before, coffee makes up roughly 3% of the country's GDP, but Brazil depends on coffee even more for its economic growth as coffee is responsible for 10% of Brazil's GDP, responsible for 8 million jobs in this sector (Foreign Policy, 2016). This is interesting, considering Brazil and Vietnam respond to changing demands for coffee with comparable increases in production. We must then concentrate on how prices move between the two.

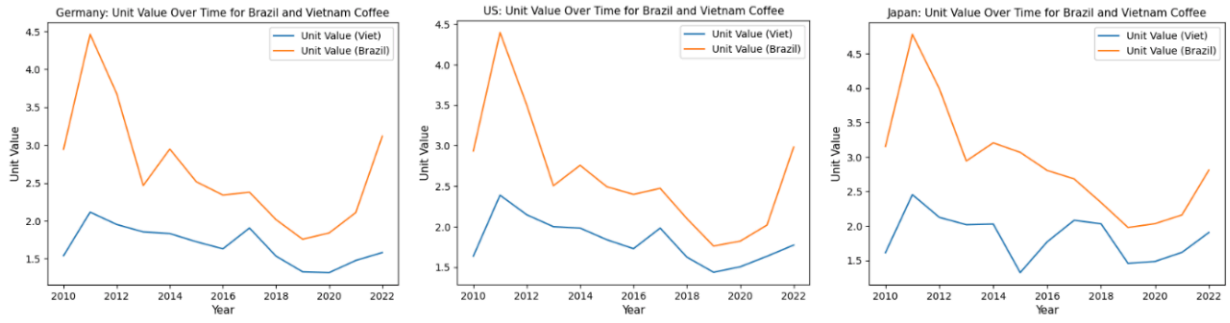


Figure 3. Germany, United States, and Japan's Coffee Unit Value from 2010 to 2022

Figure 3 demonstrates the price of Brazilian and Vietnamese coffee over time for Germany, the United States, and Japan. The correlation matrix that was implemented for all the

variables in the regression shows the price of Vietnamese coffee is highly correlated with the price of Brazilian coffee. This reflects a complication in our data and an opportunity to report the relationship between demand for both countries' exports. We can see from the visualization above that in very few instances do the two prices deviate in trend over time. They both move in the same direction - meaning that if Brazil's prices dropped, so did Vietnam's prices. Also note here that Brazil's price is, at times, twice as expensive as Vietnamese coffee. This could be an explanatory factor to why some countries will shift to importing coffee from Vietnam.

Due to the high correlation seen in *Figure 3*, we added an interaction term for the two explanatory variables. The updated regression specification with the interaction term is:

$$\Delta\,\%Share\ of\ Vietnam\ Coffee\ Export\ =\ \beta_0 + \beta_1\ unit\ value\ (Vietnam\ coffee)$$

$$+ \beta_2\ unit\ value\ (Brazil\ coffee)\ + \beta_3\,\Delta\ inflation\ + \beta_4\,\Delta GDP\ +\ \beta_5 transportation\ cost\ (Vietnam)$$

$$+ \beta_6\ transportation\ cost(Brazil)\ + \beta_7(unit\ value\ Vietnam\ *\ unit\ value\ Brazil)\ +\ e$$

Germany

OLS Regression Results

Dep. Variable:	GER_percent_share	R-squared:	0.839
Model:	OLS	Adj. R-squared:	0.678
Method:	Least Squares	F-statistic:	5.213
Date:	Sun, 10 Dec 2023	Prob (F-statistic):	0.0323
Time:	00:36:00	Log-Likelihood:	49.375
No. Observations:	13	AIC:	-84.75
Df Residuals:	6	BIC:	-80.79
Df Model:	6		
Covariance Type:	nonrobust		

	coef	std err	t	P>|t|	[0.025	0.975]
const	0.1802	0.060	2.996	0.024	0.033	0.327
GER_GDP	-3.251e-15	1.23e-14	-0.265	0.800	-3.33e-14	2.68e-14
GER_Inflation	-0.0029	0.005	-0.598	0.572	-0.015	0.009
GER_UV_Viet	0.0402	0.016	2.498	0.047	0.001	0.080
GER_UV_Bra	-0.0248	0.007	-3.634	0.011	-0.041	-0.008
GER_Transport_Viet	-0.0005	0.000	-1.190	0.279	-0.001	0.000
GER_Transport_Bra	0.0002	0.000	0.545	0.605	-0.001	0.001

Omnibus:	5.487	Durbin-Watson:	2.513
Prob(Omnibus):	0.064	Jarque-Bera (JB):	2.709
Skew:	1.086	Prob(JB):	0.258
Kurtosis:	3.533	Cond. No.	1.03e+14

Figure 4. Regression Results Summary for Germany

OLS Regression Results

Dep. Variable:	GER_percent_share	R-squared:	0.893
Model:	OLS	Adj. R-squared:	0.744
Method:	Least Squares	F-statistic:	20.81
Date:	Sun, 10 Dec 2023	Prob (F-statistic):	0.00217
Time:	00:36:00	Log-Likelihood:	52.037
No. Observations:	13	AIC:	-88.07
Df Residuals:	5	BIC:	-83.55
Df Model:	7		
Covariance Type:	HC1		

	coef	std err	z	P>|z|	[0.025	0.975]
const	-0.0939	0.236	-0.398	0.691	-0.556	0.369
GER_GDP	2.478e-14	2.61e-14	0.951	0.342	-2.63e-14	7.59e-14
GER_Inflation	0.0007	0.006	0.120	0.905	-0.011	0.012
GER_UV_Viet	0.1124	0.058	1.932	0.053	-0.002	0.227
GER_UV_Bra	0.0543	0.063	0.866	0.387	-0.069	0.177
GER_Transport_Viet	2.4e-05	0.001	0.041	0.967	-0.001	0.001
GER_Transport_Bra	-0.0004	0.001	-0.664	0.507	-0.002	0.001
GER_Interact_UV	-0.0351	0.027	-1.297	0.195	-0.088	0.018

Omnibus:	1.168	Durbin-Watson:	2.431
Prob(Omnibus):	0.558	Jarque-Bera (JB):	0.862
Skew:	0.348	Prob(JB):	0.650
Kurtosis:	1.948	Cond. No.	3.69e+14

Figure 5. Regression Results Summary for Germany with Interaction Term

In the regression results table in *Figure 4*, data for Germany reflects that an increase in the price of Brazilian coffee in Germany has a negative expected effect on the distribution of Vietnamese coffee to Germany, controlling for other key variables such as domestic (i.e., German) inflation, economic growth and respective energy costs for Brazil and Vietnam. This highlights the competition between Brazil and Vietnam, by reporting that an increase in Brazilian coffee prices in Germany (indicative of higher demand) translates to less Vietnamese exports to Germany. Statistically significant at the 5% level, a one-dollar increase in the price of Brazilian coffee in Germany results in an expected decline of roughly 2% for Germany's share of Vietnam's exports. From a time series perspective, although many explanatory variables remain insignificant, the variables explain around 84% of the variation in Germany's share of Vietnamese coffee exports. This reflects the model's explanatory power, even though interpretation proves difficult (a common characteristic of time series).

The high correlation between the price of coffee in Brazil and Vietnam is likely due to the effects of fluctuations in world coffee demand in both countries. We include an interaction term between the two variables. The regression results summary table is displayed in *Figure 5*. Including an interaction between the price of Vietnamese coffee and Brazilian coffee in Germany did yield a higher R-squared and had a p-value near ~20%, reflecting borderline significance. We are comfortable with a near 20% chance of error due to the low stakes and time series nature of our modeling.

United States

Conversely, US data displayed statistically insignificant impacts of Brazilian and Vietnamese coffee prices on the distribution of Vietnamese coffee exports, as shown in *Figure 6*. This could be due to the high correlation between Vietnamese and Brazilian coffee prices or the

US. Although our variables of interest show the expected sign (positive for Vietnam's price and negative for Brazil's price), the statistical significance limits our ability to make conclusions regarding the general effect of Brazil's competitive prices on Vietnamese exports. In this

OLS Regression Results

Dep. Variable:	US_percent_share	R-squared:	0.772
Model:	OLS	Adj. R-squared:	0.608
Method:	Least Squares	F-statistic:	1.148
Date:	Sun, 10 Dec 2023	Prob (F-statistic):	0.418
Time:	00:36:03	Log-Likelihood:	43.276
No. Observations:	13	AIC:	-74.55
Df Residuals:	7	BIC:	-71.16
Df Model:	5		
Covariance Type:	HC1		

	coef	std err	z	P>|z|	[0.025	0.975]
const	0.3489	0.092	3.782	0.000	0.168	0.530
US_GDP	-8.727e-15	3.61e-15	-2.414	0.016	-1.58e-14	-1.64e-15
US_Inflation	0.0079	0.009	0.847	0.397	-0.010	0.026
US_UV_Viet	0.0093	0.028	0.329	0.742	-0.046	0.065
US_UV_Bra	-0.0110	0.016	-0.685	0.493	-0.042	0.020
US_Transport_Viet	-0.0005	0.000	-1.133	0.257	-0.001	0.000
US_Transport_Bra	-0.0004	0.000	-0.879	0.380	-0.001	0.001

Omnibus:	0.099	Durbin-Watson:	1.358
Prob(Omnibus):	0.952	Jarque-Bera (JB):	0.325
Skew:	-0.010	Prob(JB):	0.850
Kurtosis:	2.226	Cond. No.	6.77e+14

Figure 6. Regression Results Summary for the United States

OLS Regression Results

Dep. Variable:	US_percent_share	R-squared:	0.891
Model:	OLS	Adj. R-squared:	0.783
Method:	Least Squares	F-statistic:	124.9
Date:	Sun, 10 Dec 2023	Prob (F-statistic):	4.95e-06
Time:	00:36:03	Log-Likelihood:	48.104
No. Observations:	13	AIC:	-82.21
Df Residuals:	6	BIC:	-78.25
Df Model:	6		
Covariance Type:	HC1		

	coef	std err	z	P>|z|	[0.025	0.975]
const	0.0451	0.007	6.550	0.000	0.032	0.059
US_GDP	-6.431e-15	2.33e-15	-2.760	0.006	-1.1e-14	-1.86e-15
US_Inflation	0.0141	0.008	1.777	0.076	-0.001	0.030
US_UV_Viet	0.1014	0.026	3.834	0.000	0.050	0.153
US_UV_Bra	0.0831	0.010	8.418	0.000	0.064	0.102
US_Transport_Viet	0.0005	0.000	1.198	0.231	-0.000	0.001
US_Transport_Bra	-0.0012	0.000	-2.637	0.008	-0.002	-0.000
US_Interact_UV	-0.0385	0.005	-7.193	0.000	-0.049	-0.028

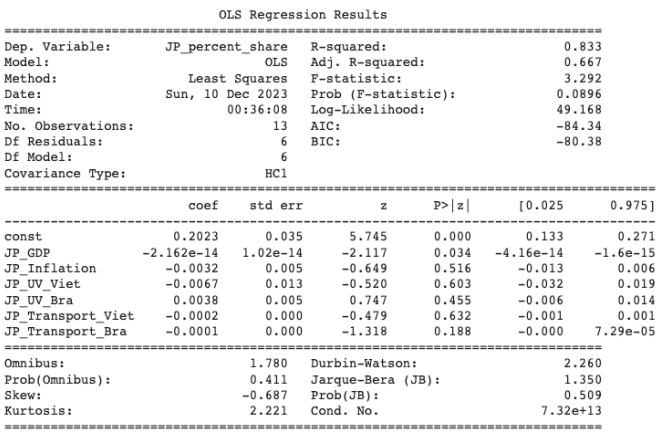
Omnibus:	0.575	Durbin-Watson:	1.675
Prob(Omnibus):	0.750	Jarque-Bera (JB):	0.594
Skew:	-0.372	Prob(JB):	0.743
Kurtosis:	2.263	Cond. No.	1.23e+15

Figure 7. Regression Results Summary for the United States with Interaction Term

regression model, we can see that all the variables did not show a statistically significant p-value, except for the U.S. GDP variable. US GDP's average change is roughly $868 million between 2010 and 2022. GDP's beta coefficient tells us that for a $868 million increase in US GDP, the US share of Vietnamese export volume will expectedly decrease by around 0.75%. Interestingly, we are seeing a similar pattern in this regression analysis as Germany's results for the sign of the beta-coefficients for the unit value of Vietnam and Brazil's coffee. The negative coefficient for Brazilian coffee prices in Germany reflects the competition between Brazilian and Vietnamese coffee prices. An increase in Brazilian coffee prices could reflect an increase in demand for Brazilian coffee. We note that a $1 increase in Brazilian coffee results in an expected decline of the country's share of Vietnamese coffee exports by approximately 1.1%. In other words, if Brazilian coffee becomes more popular in Germany (higher demand), Vietnam sends less coffee to Germany.

Similarly, due to the high correlation score between the two competing countries' unit values, we created an interaction term between those two variables and added it to the original regression model specification. With this interaction term added, interestingly, the R-squared score increased by 12%, making a variation in the model 89% explained by the independent variables as seen in *Figure* 7. Moreover, there are more statistically significant variables, including the prices of Vietnam and Brazil coffee that we are primarily focusing on. They were not significant on their own, but with this included interaction term, they became significant. Because of that, we can see that the standard errors are also impacted as they have decreased from the original regression. This could be because the standard error of the error term dropped due to a higher R-squared, which in turn explains the model much better.

Japan



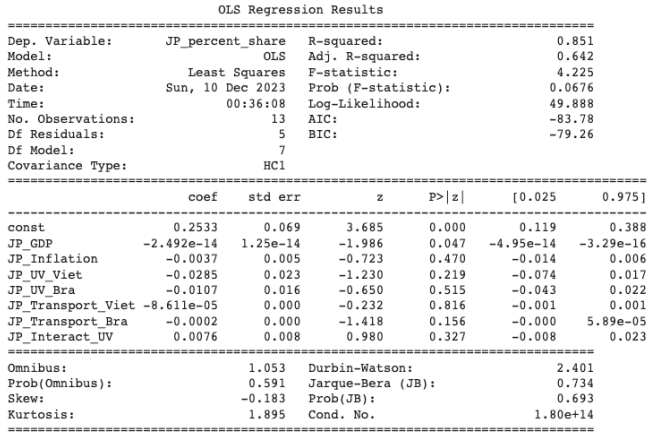
OLS Regression Results

Dep. Variable:	JP_percent_share	R-squared:	0.833
Model:	OLS	Adj. R-squared:	0.667
Method:	Least Squares	F-statistic:	3.292
Date:	Sun, 10 Dec 2023	Prob (F-statistic):	0.0896
Time:	00:36:08	Log-Likelihood:	49.168
No. Observations:	13	AIC:	-84.34
Df Residuals:	6	BIC:	-80.38
Df Model:	6		
Covariance Type:	HC1		

	coef	std err	z	P>|z|	[0.025	0.975]
const	0.2023	0.035	5.745	0.000	0.133	0.271
JP_GDP	-2.162e-14	1.02e-14	-2.117	0.034	-4.16e-14	-1.6e-15
JP_Inflation	-0.0032	0.005	-0.649	0.516	-0.013	0.006
JP_UV_Viet	-0.0067	0.013	-0.520	0.603	-0.032	0.019
JP_UV_Bra	0.0038	0.005	0.747	0.455	-0.006	0.014
JP_Transport_Viet	-0.0002	0.000	-0.479	0.632	-0.001	0.001
JP_Transport_Bra	-0.0001	0.000	-1.318	0.188	-0.000	7.29e-05

Omnibus:	1.780	Durbin-Watson:	2.260
Prob(Omnibus):	0.411	Jarque-Bera (JB):	1.350
Skew:	-0.687	Prob(JB):	0.509
Kurtosis:	2.221	Cond. No.	7.32e+13

Figure 8. Regression Results Summary for Japan



OLS Regression Results

Dep. Variable:	JP_percent_share	R-squared:	0.851
Model:	OLS	Adj. R-squared:	0.642
Method:	Least Squares	F-statistic:	4.225
Date:	Sun, 10 Dec 2023	Prob (F-statistic):	0.0676
Time:	00:36:08	Log-Likelihood:	49.888
No. Observations:	13	AIC:	-83.78
Df Residuals:	5	BIC:	-79.26
Df Model:	7		
Covariance Type:	HC1		

	coef	std err	z	P>|z|	[0.025	0.975]
const	0.2533	0.069	3.685	0.000	0.119	0.388
JP_GDP	-2.492e-14	1.25e-14	-1.986	0.047	-4.95e-14	-3.29e-16
JP_Inflation	-0.0037	0.005	-0.723	0.470	-0.014	0.006
JP_UV_Viet	-0.0285	0.023	-1.230	0.219	-0.074	0.017
JP_UV_Bra	-0.0107	0.016	-0.650	0.515	-0.043	0.022
JP_Transport_Viet	-8.611e-05	0.000	-0.232	0.816	-0.001	0.001
JP_Transport_Bra	-0.0002	0.000	-1.418	0.156	-0.000	5.89e-05
JP_Interact_UV	0.0076	0.008	0.980	0.327	-0.008	0.023

Omnibus:	1.053	Durbin-Watson:	2.401
Prob(Omnibus):	0.591	Jarque-Bera (JB):	0.734
Skew:	-0.183	Prob(JB):	0.693
Kurtosis:	1.895	Cond. No.	1.80e+14

Figure 9. Regression Results Summary for Japan with Interaction Term

Lastly, we ran our regression for Japan to see how the changes in the percent share of Vietnam coffee exports are impacted by our variables. In *Figure 8*, on the flip side, the analysis of Japan indicates that the influence of Brazilian and Vietnamese coffee prices on the distribution

of Vietnamese coffee exports is statistically insignificant. This lack of significance might be explained by the strong correlation between Vietnamese and Brazilian coffee prices in Japan's market, similar to Germany and the United States. Despite the anticipated directional trends in our variables of interest – positive for Vietnam unit value and negative for Brazil unit value – the absence of statistical significance limits our ability to draw conclusions about the overall impact of Brazil's competitive prices on Vietnamese exports. It is worth noting that, within this regression model, none of the variables, except for the GDP variable, demonstrated a statistically significant p-value.

The same interaction term was added to the regression model, but there is no outstanding notes on the difference between these two regression model. Again, only GDP stood out as a statistically significant variable in *Figure 9*. Since the coefficient is negative, it indicates a negative relationship between Japan's GDP and the percent share of Vietnam's coffee exports. In other words, an increase in Japan's GDP is associated with a decrease in the percent share of Vietnam's coffee exports. You can use a similar interpretation for the other variables. Japan's beta coefficients of interest (prices of Vietnam's and Brazil's coffee) do not show statistical significance. However, interpreting the variables as is suggests that Brazil and Vietnam coffee may be substitutes for Japan. A $1 increase in the price of Brazilia coffee in Japan leads to an expected increase in Japan's share of Vietnamese coffee exports of 0.4%. Japan's proximity to Vietnam makes it an attractive export market. As Brazilian coffee is likely already expensive for Japan to import, any increase in Brazilian coffee prices may discourage Japanese coffee imports from Brazil. Adding an interaction term between Vietnamese and Brazilian coffee prices reflects that increases in Vietnamese coffee prices lead to a decline in share to Japan, however, this effect is diminished by a similar increase in Brazilian coffee prices.

Conclusion

In conclusion, this study delves into the intricate dynamics of Vietnam's coffee industry, emphasizing its pivotal role in the country's economy and cultural fabric. The empirical analysis, using regression models, explores the impact of relative coffee prices between Vietnam and Brazil on Vietnam's coffee exports to Germany, the U.S., and Japan. The results unveil nuanced patterns, highlighting the competitive dynamics between the two major coffee-exporting nations. Overall, the findings varied across the country. While Germany's data shows a negative correlation between Brazilian coffee prices and Vietnamese exports in their beta coefficients, we found statistically significant results in the two key variables that we wanted to emphasize in this study: unit values for Brazil and Vietnam. Notice that Vietnam appears to compete more with Brazil for coffee in Germany and the U.S. We also saw that an increase in the price of Brazilian coffee, an indicator of higher demand, leads to fewer Vietnamese exports there. Notably, these results are only statistically significant for Germany. Japan, too, reveals complexities in its market dynamics. If the price of Brazilian coffee goes up, Vietnam's exports there increase, as demonstrated through the sign on their beta-coefficients. This shows that Vietnam has more control over Japan’s market, which could be due to the geographic convenience between the two countries.

Moreover, we include an interaction term between unit values Vietnam and Brazil because of the high correlation score between the two variables. Although for some countries it did not demonstrate statistical significance with the interaction term, we were able to raise the R-square score in all models of all three countries, which is indicative of better model representation. With the US, although the analysis exhibits statistical insignificance in the original model, we were able to achieve the level of marginal significance by including this

interaction term. This could be because the U.S. mostly imports its coffee more from South American countries (Honduras, Columbia, Peru, etc.), whereas in Germany, the main suppliers of their coffee are Brazil and Vietnam. Another factor to consider is that the U.S. tends to favor more towards Arabica beans and Germany tends to have a preference for both Arabica and Robusta beans. Therefore, importing coffee from countries that specialize in the coffee beans of preference would be compatible, reflecting that more than 93% of the coffee Vietnam produces is Robusta. The study, overall, contributes valuable insights into the intricate interplay of factors influencing Vietnam's coffee exports, paving the way for a deeper understanding of this thriving industry.

Like every study, there are some limitations. Some that we can think of that can affect our results are due to omitted variable bias, as well as the problems of a few observations in this study. Moreover, there is the issue of multicollinearity. Because the coffee industry is multifaceted, we were not able to take into account factors such as weather conditions, the exchange rates of respective countries' currencies, the total production of each country, etc. One other important factor that we did not include was the tariffs on coffee exports. From research, Brazil has not been implementing an export tax for their coffee since 2011, whereas the 0% tax was newly implemented in Vietnam in 2022, only for the EU. This could play a crucial role in interpreting the changes in the percent share of Vietnam coffee exports. The issue of multicolinearity is also worth noting as the explanatory variables in the regression analysis did have some correlation with one another. For further studies, it would be interesting to add on those variables to fully grasp the effect. Along with that, adding more countries and more years to the analysis would also determine a better understanding of our question as we have only measured this effect from 2010 to 2022.

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Appendix

Python Code: ECON - Final Project.ipynb

Data Link: ECON - Final Project Data