DATA ANALYST PROJECT: RECENT RICE TREND IN THE PHILIPPINES

by JUSTIN ANDREW CRUZANA

I felt strongly compelled to make a project about recent rice supplies and imports in the Philippines. As a Filipino who grew up in Metro Manila and had rice as their primary household food source, I was wondering what the statistics of rice would look like, especially since RA11203, or the Rice Liberalization Law, was signed into effect in February of 2019.

In this data analyst project, let's see how different the rice production, importation, and prices are. We can also compute the self-sustainability ratio of the Philippines by making a query in SQL.

METHODOLOGY

The rice data was collected from the Philippine Rice Research Institute's website, which is accessible through this link: www.philrice.gov.ph. The data with average rice prices for farmgate (price sold by farmers), wholesale, and retail comes from www.palaystat.philrice.gov.ph.

The years provided in the data are from 2015-2021 for two reasons:

1. Because of the infamous rice inflation in 2018, I thought it would be of interest to see the differences and/or spikes in numbers years before 2018.
2. RA11203 was implemented in 2019, so I thought it would be interesting to see any drastic change between this year and the previous year, 2018, as well as any future years ahead.

SQL will be the main programming platform, as it provides very clear instructions and query control. The two tables, average rice price and rice supply, reference one another through their “years” column, in case we need to see both of them present in one query.

All data gathered are observational data and is based on the behavior of the market. In gathering queries, statistical inference will be applied if need be, and tables and/or graphic visualization will be deployed if possible.

QUESTIONS

1. Was the 2018 inflation a significant change in price?
2. How significant is the decrease in price during and after 2019, when RA11203 was signed?
3. What will the trend of rice imports look like in 2019?
4. Will the rice production increase or decrease during and after 2019?
5. What is the relationship between price and supply of rice?
6. Calculate the self-sufficiency ratio. Is it getting better or worse?

CONSTRAINTS

It would have been very insightful if there were updated data for farmers from the Philippine Rice Research Institute's database. Unfortunately, these data have not been updated since at least 2016, so currently no tangible information about their livelihood, income, life expectancy is provided as this research is utilizing updated data from the past half-decade (2015-2021).

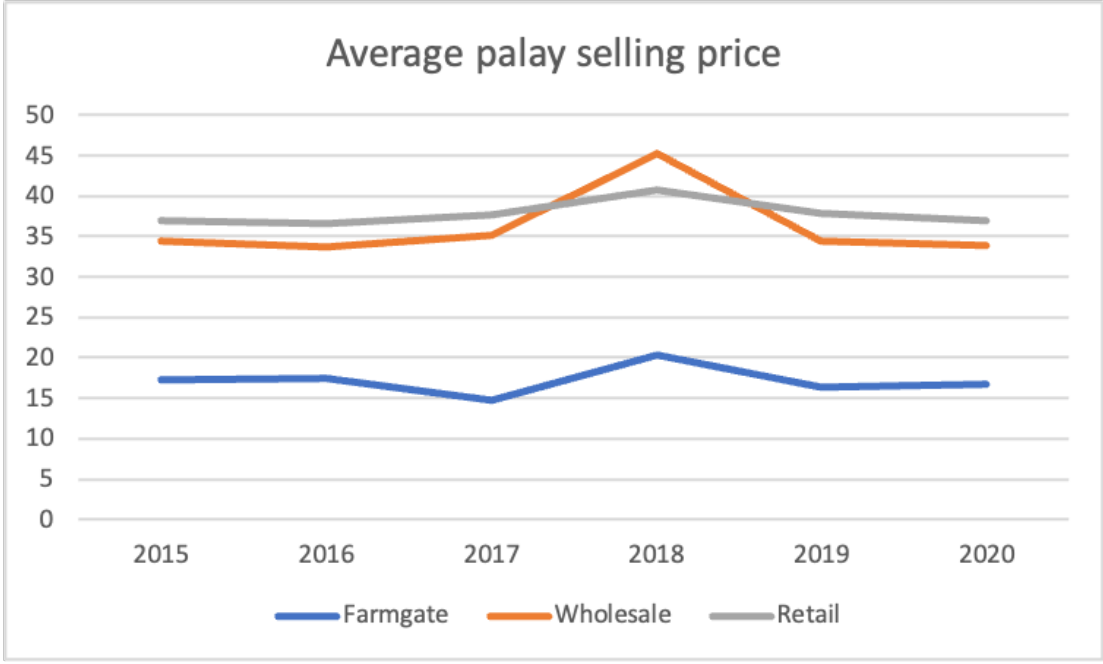
In the average price table, there is currently no data for 2021 because it has not been updated yet. I still kept the year because I wanted the dimensions of both supply and price tables to match, so instead of removing the row completely, I turned the values into null by default, and should they appear in the queries they will be 0.

QUESTION 1:

Inflation is measured by increases in prices. According to the query, all modes of selling palay has increased drastically in 2018. I'll lay out a graph at the bottom to show the large spike.

The Department of Agriculture might have its own significance level in measuring drastic changes in numbers. Say our own significance level is 5%. From 2017 to 2018, there is a 38.60% increase in farmgate selling prices, a 28.84% percent increase in wholesale, and a 8.61% increase in retail. *All these changes exceed our significance level of 5%.*

If we look closely at the graph, we can see that the increase in price was already beginning and escalating in 2017. It wasn't until 2018 that it became such a drastically large concern. Perhaps, in predicting the inflation for 2018 and subsequent signing of RA11203 in 2019, the data analysts in government noticed the increase in price at the start of 2017 and quickly reported it, therefore signaling any relevant parties to prepare RA11203[1].



[1] It is important to note that this is only one of two important factors in signing RA11203. The World Trade Organization (WTO) has requested that all agricultural products imported to the Philippines should be imposed with tariffs instead of quantitative restrictions. Under special conditions, rice has been the only agricultural product barred with quantitative restrictions, *not* tariffs, from 1996 to 2017.

QUESTION 2

Quick look into the graph sees the quick decrease of price the next year. Additionally, I'll be attaching a table lifted from the SQL query from my terminal.

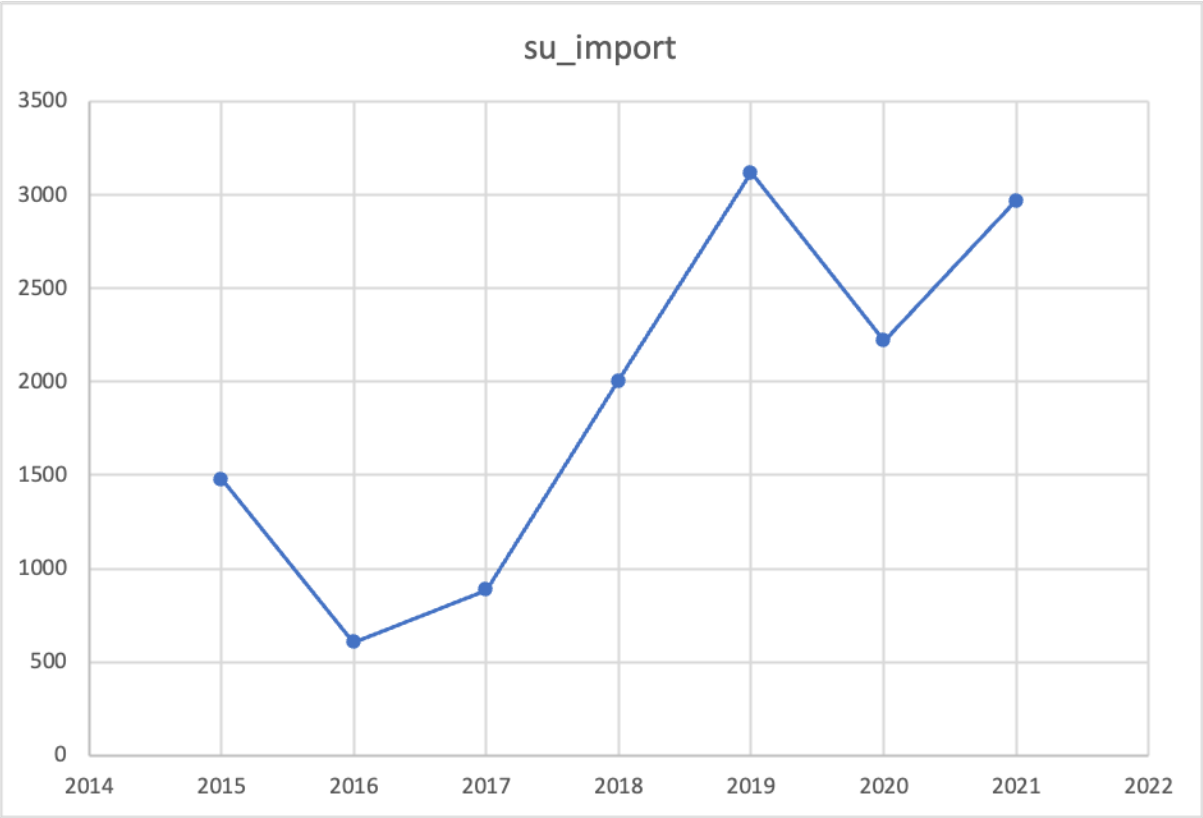
From 2018 to 2019, there is a 24.04% decrease in price, 31.46% decrease in wholesale, and a 7.84% decrease in retail. While both wholesale and retail decreased further in prices the next year by a tad, farmgate's prices increased slightly.

year	farmgate	wholesale	retail
2015	17.33	34.46	37.06
2016	17.43	33.69	36.67
2017	14.74	35.13	37.62
2018	20.43	45.26	40.86
2019	16.47	34.43	37.89
2020	16.72	33.94	36.93
2021	0	0	0

QUESTION 3

RA11203 incentivizes various countries to import to the Philippines by lifting the quantitative restrictions on rice and replacing it with imposed tariffs. Meaning countries with great volumes of rice can export as much rice as they want as long as they are subject to the appropriate tariff rates.

True to the expected nature of RA11203, imports increased massively in 2019, and kept a momentum of high imports thereon. Here is a plot graph to show the movement.

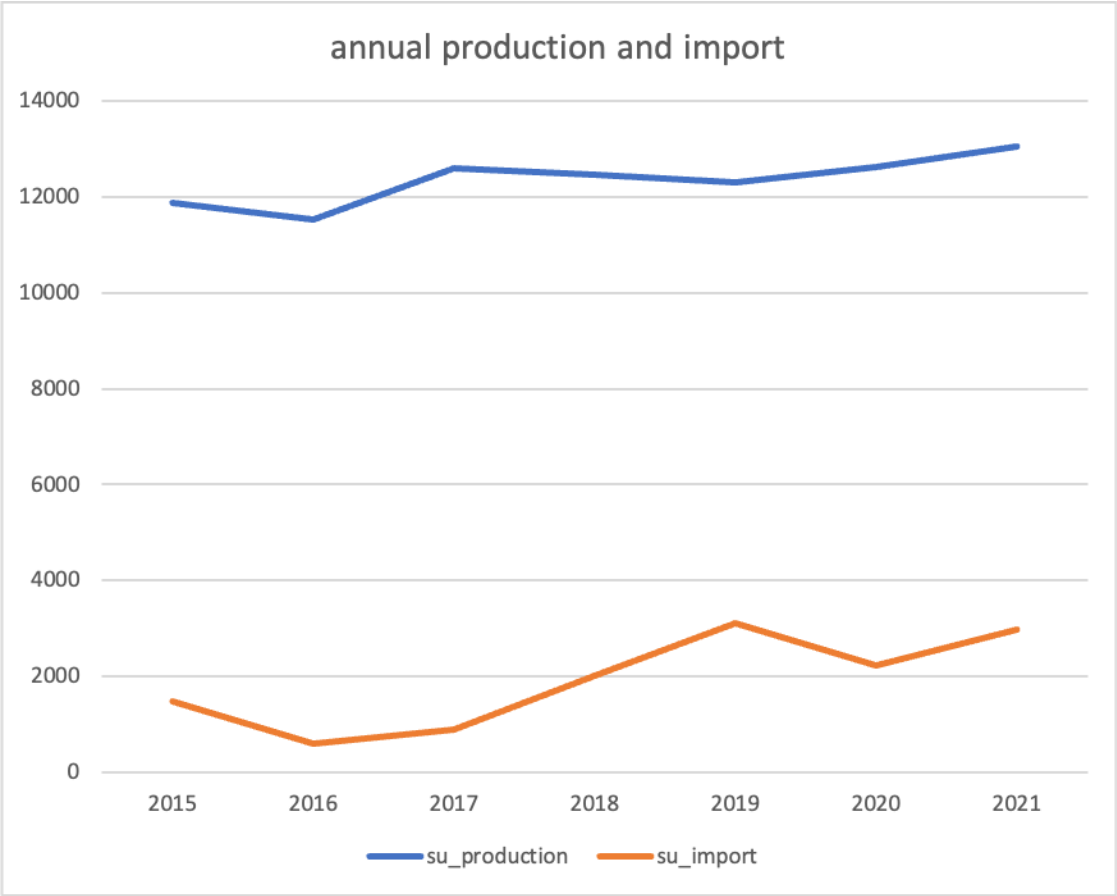


Imports increased from 2002 to 3118, a 35.79% rise. It dipped the next year in 2020, which could be a constraint or effect of the global pandemic, but quickly recovered in 2021.

QUESTION 4

Rice production has had a healthy but fluctuating growth over the years covered by the available data. It's the potential shift in 2019 which greatly interests us in the project, because it was the year of RA11203's implementation. With the increase in imports, what should happen to the trend in production?

By putting the trend of imports into perspective, this is how much rice is produced in metric tons. In 2019, it decreased by 1.33%, the same year imports increased by a large amount. However, it increased gradually per year starting the next year, 2020. It caps at 13054 in metric tons in 2021. What could it imply that production is starting to increase, along with imports? Here is a graph showcasing the movement in both of them.



QUESTION 5

In economics, the law of supply dictates that the higher the supply, the higher the price. Let us see if this is the case with rice in the Philippines by showing the table of results.

year	su_gross_supply	farmgate	wholesale	retail
2015	16010	17.33	34.46	37.06
2016	15332	17.43	33.69	36.67
2017	16256	14.74	35.13	37.62
2018	16761	20.43	45.26	40.86
2019	17974	16.47	34.43	37.89
2020	17513	16.72	33.94	36.93

Here, I gathered the gross supply[2] and the different prices. We see in 2016, when gross supply decreased, so did wholesale and retail. In 2017, when it increased, so did the two price columns. They have a direct relationship up until 2019, where the gross supply increased but all prices decreased, including farmgate, and in 2020 the relationship between whole and retail is directly proportional to gross supply again.

Farmgate prices, however, have an indirect relationship with rice supplies. It increases when supply decreases and increases when supply decreases. It's first direct relationship in terms of movement is in 2018 during the inflation and in 2019 when it stopped and the Philippines adopted RA11203. It reverts back to its natural relationship with supply in 2020, when the supply decreased but its price increased.

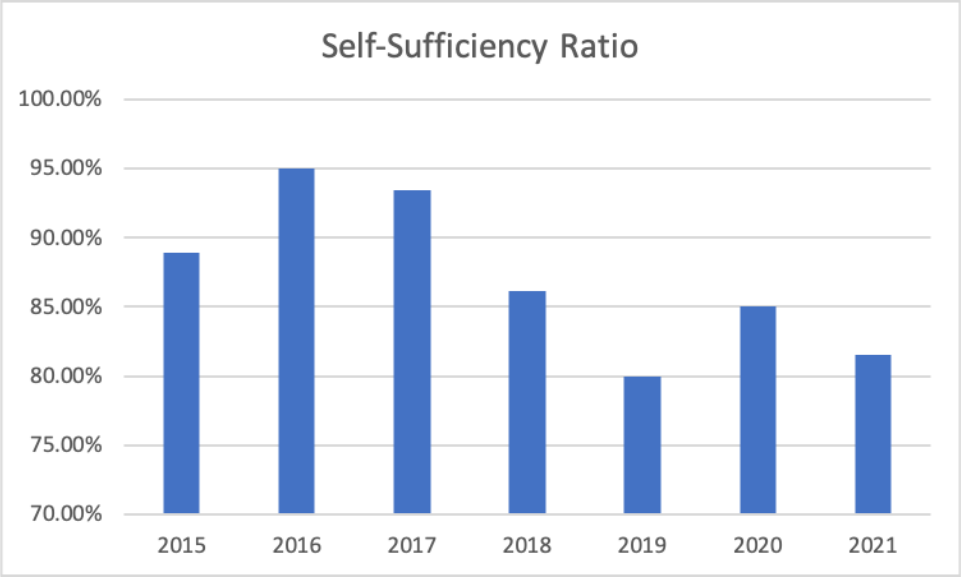
[2] Gross supply = beginning rice supply + production + imports.

QUESTION 6

A self-sufficiency ratio, according to the Philippine Statistic Authority, “shows the magnitude of production in relation to domestic utilization”. It becomes a method of measuring how a country can sustain enough products for a population.

The formula is (production / (production + imports – exports). If the result is one or greater, we have enough rice or more than enough to sustain ourselves as a country. If we have less, then we do not. Because there is no tangible data for exports of rice due to its low numbers in metric tons, we leave out the formula.

By making the query in SQL, here is the chart we came up with, along with a table I took directly from the query.



year	Self-Sufficiency Ratio	in percentage	status
2015	0.8893	88.93%	Not sufficient
2016	0.9501	95.01%	Not sufficient
2017	0.9344	93.44%	Not sufficient
2018	0.8617	86.17%	Not sufficient
2019	0.7978	79.78%	Not sufficient
2020	0.8505	85.05%	Not sufficient
2021	0.8148	81.48%	Not sufficient

In the table, none of the years have actually met the cap of one-hundred percent or 1. We hit our lowest during 2019, where production decreased but imports increased greatly, but slowly recovers the next year, albeit fluctuates in 2021.

The self-sufficiency ratio is a difficult measurement, because while it technically does work in measuring self-sufficiency, it does not adequately surmise if we can live off our own production alone.

CONCLUSIONS

While the data is small, I believe it adequately shows the changes in rice trends, especially between two important events: the rice inflation and the shift from quantitative restrictions in imports to a tariff law that liberalizes and invigorates the cycle of rice supply into the market.

We've seen in numbers the significant increase of price in 2018 during the inflation, its possible forecasted results that might have become the gateway for waiving the quantitative restriction law, and its decrease after one year, in 2019.

We've seen a steady increase in imports because of RA11203, but also an increase in rice production. Perhaps, because of the liberalized market, farmers have become vulnerable to a now "competitive" field in rice production, and have been forced to compete against importation, therefore raising the self-sufficiency ratio.

We've seen that the law of supply does work directly with retail and wholesale price, but is inverse with the price of farmers' selling prices (farmgate). It is a curious indirect relationship, because it seems to be telling of the farmers' place in the economy. It beckons another analysis of farmers' data that occurs the same time as 2015-2021 as well.

Finally, we glimpsed at the self-sufficiency ratio, an interesting but insufficient measurement of self-sustainability that is influenced by the number of imports and production. The Philippines being a collection of islands with no major river deltas makes outsourcing rice from other countries that produce vast quantities of it (like, for instance, Vietnam, our top supplier) makes importation seem like an imperative. I would love to hear reviews, thoughts, and criticisms about this data analyst project and to make more about Philippine statistics in the future!

Works cited:

Data comes from Philippine Rice Research Institute, both accessed 2023: www.philrice.gov.ph and www.palaystat.philrice.gov.ph

Abello, Lizst and Umil, Anne Marxze. *#TheRealDuterteLegacy | Farmers bear the brunt of Duterte's rice liberalization policy.* Bulatlat, 2022. Accessed 2023: https://www.bulatlat.com/2022/06/30/farmers-bear-the-brunt-of-dutertes-rice-liberalization-policy/

Alpasan, Jonas. *Self-sufficiency entails repeal of rice liberalization law,* from Bulatlat, 2023. Accessed 2023: https://www.bulatlat.com/2023/04/19/self-sufficiency-entails-repeal-of-rice-liberalization-law/

Department of Agriculture, *DA assures stable rice supply amid El Niño Treat,* 2023. Accessed 2023: https://www.da.gov.ph/da-assures-stable-rice-supply-amid-el-nino-threat/

Guzman, Rosario Bella. *What the Rice Tariffication Law Violates,* Bulatlat, 2019. Accessed 2023: https://www.bulatlat.com/2019/04/11/what-the-rice-tariffication-law-violates/

IBON Foundation, *Rice Tariffication harmed rice farmers,* 2022. Accessed 2023: https://www.ibon.org/rice-tariffication-harmed-rice-farmers/

Ichimura, Anri. *The Rice Tariffication Law, explained,* from F&B Report, 2019. Accessed 2023: https://fnbreport.ph/9689/the-rice-tariffication-law-explained/

Macaraeg, Aron. *World biggest rice importer? Peasant group renews call to junk liberalization law,* Bulatlat, 2019. Accessed 2023:

https://www.bulatlat.com/2019/11/11/world-biggest-rice-importer-peasant-group-renews-call-to-junk-liberalization-law/

Peña, Dawn. *Under Duterte, farmers see staggering decline in rice production,* Bulatlat, 2021. Accessed 2023: https://www.bulatlat.com/2021/06/30/under-duterte-farmers-see-staggering-decline-in-rice-production/

Philippine Statistics Authority. *Self-Sufficiency Ratio (SSR) of Selected Agricultural Commodities by Commodity and Year.* accessed 2023: https://openstat.psa.gov.ph/Metadata/2E5FSSR0