



Pricing Movements of Copra in the Philippines

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Abstract

Philippines is the second largest coconut producer in the world, second only to Indonesia. Over a million farmers are currently dependent on this agricultural commodity and are suffering from depressed commodity price over the past decade. The paper examined the factors that determined the local market prices of copra by testing the theories of substitution, competition and international pressures. Results tend to indicate that “profit” pressures brought about the desire to retain as much economic benefit for the local large-scale exporters of the product is the single most important determinant of the depressed local copra prices. Likewise, data also support the hypothesis that the “substitution” effect of palm oils adversely affected local copra prices.

Keywords: Substitution, Competition, Global market price, Local copra prices.

1. Introduction

Next to rice, coconut production is considered critical in the nation’s agricultural economy. Philippines is the world’s second largest producer of coconut products (U.S. Library of Congress, retrieved May, 2013) after Indonesia. In fact, 6.7% of the country’s exports are accounted for by coconut products: oil, copra and desiccated coconut. The coconut industry accounts for close to a million farmers and roughly 20,000 coconut traders. The industry’s volatile pricing of coconut products, particularly the copra has caused serious concern among the farmers and traders. Coconut prices significantly fell in the early 1980’s, then rose again after a re-structuring of the industry, and thereafter, a period of up and down swings in coconut prices were observed. Such unstable, albeit, almost unpredictable price scenario discourage both the growers and the traders which ultimately will impact negatively on the industry itself. This paper explores the mill gate copra price movements with the end-in-view of understanding price patterns in relation to keyeconomic variables in the Philippine economy.

Apart from industry policies which have huge impact in pricing, competition and substitution are the two (2) key economic parameters that dictate commodity prices on a macro-scale. Thus, when more and more coconut product suppliers join the world market for the product, prices will adjust naturally to an equilibrium for a given number of suppliers. Likewise, when new substitute products are developed at lower costs, the prices of the commodity also react to compete with the lower prices of the new substitute products. For instance. Coconut oil faces stray competition with the much lower-priced palm oils (Fiji, 2012).

In this paper, we examine the movements of these two key economic parameters for the last decade and the mill gate prices of copra. As a surrogate measure of “competition”, we considered production of copra (which admittedly is a weak measure for competition) while for substitution, we obtained data for the mill gate prices of oil palm. We then fitted probability models for these parameters and discuss the consequences of the price movements observed.

2. Data and Data Source

The data on mill gate prices of copra were obtained from the Philippine Coconut Authority (series 1996 to 2006) while the palm oil prices were gathered from World Bank data base (series 1995 to 2013). There were several years in the two series when the data for one or both variables are missing. Hence, we only considered those years for which both data are available.

Table-1. Data for prices of Palm oil and copra

PALM LOCAL (PESO/KG)	COPRA LOCAL (PESO/KG)
12.6266	12.25
12.6559	12.43
12.1208	12.46
12.9521	13.30
12.6501	13.83
11.6959	15.05
10.9574	13.32
11.7613	12.54
12.2797	11.70
11.7663	12.57
12.2527	12.84
12.6300	12.90
13.7567	13.12
13.9984	13.65
13.3947	12.70
13.4245	11.75
13.3983	10.11
12.4280	10.49
12.8614	9.57
13.3810	9.43
15.7075	10.05
17.1199	11.57
17.2335	10.92
0.0000	11.17
23.3716	12.51
23.5925	12.55
22.6451	12.74
25.1866	13.52
25.0085	15.03
24.2045	15.76
24.4524	16.57
25.7196	16.26
27.4556	16.68

Source: Philippine Coconut Authority and World Bank Bulletin

Table-2. Data for area planted (SQ.M) and copra

AREA PLANTED(SQ.M)	COPRA LOCAL (PESO/KG)
314.904	12.25
314.904	12.43
314.904	12.46
314.904	13.30
314.904	13.83
314.904	15.05
314.904	13.32
314.904	12.54
314.904	11.70
314.904	12.57
314.904	12.84
314.904	12.90
313.432	13.12
313.432	13.65
313.432	12.70
313.432	11.75
313.432	10.11
313.432	10.49
313.432	9.57
313.432	9.43
313.432	10.05
313.432	11.57
313.432	10.92
313.432	11.17
311.583	12.51
311.583	12.55
311.583	12.74
311.583	13.52
311.583	15.03
311.583	15.76
311.583	16.57
311.583	16.26
311.583	16.68

Source: Philippine Coconut Authority Bulletin, 1990-2005

3. Results and Discussions

We attempted to test our hypotheses that the local prices of copra in the Philippines are affected by the presence of competition (increased supply due to increase in the number of coconut growers), substitution (palm oil as substitute for coconut oil) and global market prices.

Table- 3. Data for world and local market prices of copra

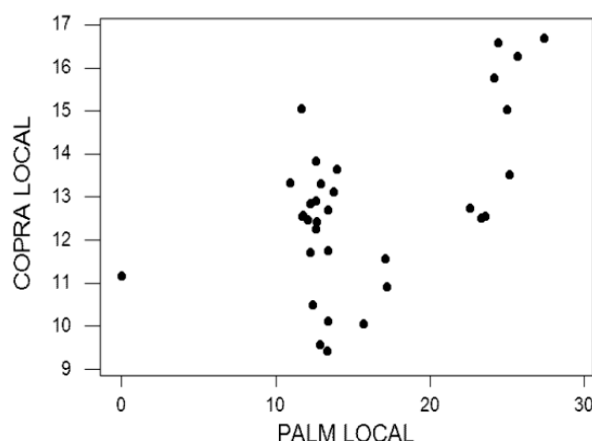
WORLD MARKET PRICE	COPRA LOCAL (PESO/KG)
16.8273	12.25
16.8273	12.43
16.8273	12.46
16.8273	13.30
16.8273	13.83
16.8273	15.05
16.8273	13.32
16.8273	12.54
16.8273	11.70
16.8273	12.57
16.8273	12.84
16.8273	12.90
16.8273	13.12
16.8273	13.65
16.8273	12.70
16.8273	11.75
16.8273	10.11
16.8273	10.49
16.8273	9.57
16.8273	9.43
16.8273	10.05
16.8273	11.57
16.8273	10.92
16.8273	11.17
19.2809	12.51
19.2809	12.55
19.2809	12.74
19.2809	13.52
19.2809	15.03
19.2809	15.76
19.2809	16.57
19.2809	16.26
19.2809	16.68

Source: Fiji Bureau of Statistics 1990-2011.

3.1. Substitution Effect

Figure-1. shows the plot of local gate prices for copra (Y) against the local gate prices for palm oil (X).

Figure-1. Plot of local copra price against local Palm Oil price



The graph shows a concave upward quadratic trend. We therefore postulated an econometric model of the form:

$$Y = a + bX + cX^2$$

where Y = local copra price and X = local palm oil price. Results of the regression analysis performed yielded table 3.

The regression equation shows that the prices of the two commodities are inversely related (b = -0.152) so that an increase in the local palm oil prices would mean a decrease in the local copra prices. Conversely, a decrease in the local palm oil prices would increase the local copra prices. This clearly demonstrates the “substitution” impact of palm oil on copra (and, thus, coconut production). Moreover, roughly 38% of the variance in the local copra prices are explained by the variance in the local palm oil prices. The effect size is reported as 0.152 although this was found to be statistically non-significant due perhaps to the limited number of observations used.

We found tentative evidence that palm oil acts as a substitute to coconut production in the agricultural sector.

Table-3. Quadratic regression of local copra price against local Palm oil price

COPRA LOCAL = 12.3 - 0.152 PALM LOCAL + 0.00987 PALM SQUARED				
Predictor	Coef	SE Coef	T	P
Constant	12.335	1.489	8.28	0.000
PALM LOC	-0.1519	0.1833	-0.83	0.414
PALM SQU	0.009872	0.005360	1.84	0.075
S = 1.542	R-Sq = 38.4%	R-Sq(adj) = 34.3%		

Table-4. Copra prices as a function of supply (increased competition)

COPRA LOCAL = 167 - 0.493 AREA (sq.m)				
Predictor	Coef	SE	T	P
Constant	167.39	75.46	2.22	0.034
AREA (sq.m.)	0.4933	0.2407	-2.05	0.049
S = 1.813	R-Sq = 11.9%	R-Sq(adj) = 9.1%		

3.2. Competition Effect

An increase in the area planted to coconuts can mean increase in the number of growers of coconuts in the industry (hence, increase competition) although this indicator best represents increase supply of coconuts. A regression analysis performed on the local copra prices against supply (represented by increased area planted to coconuts) revealed the results found in Table 4 above.

The increased in supply has negatively impacted on the local copra prices. The regression coefficient of -0.493 reveals that an increase of 1 unit area planted to coconut correspondingly implies a decrease of .493 in the copra prices. Moreover, this factor explains 12% of the variance found in the local copra prices. The relationship between local copra prices and supply (area planted) was found statistically significant at the .05 probability level.

Again, we found tentative evidence that competition plays a significant role in the local pricing of copra in the Philippines.

3.3. International and Global Pressures on Local Copra Prices

Finally, we obtained the global market prices for copra and compared this with the local copra price to determine how much of the copra price actually went to the exporters of the product. Table 5 shows the statistics for the percentage of the global market price of copra that went to the exporters of the product:

Table-5. Data for world and local market prices of Copra

WORLD PRICE	MARKET	COPRA LOCAL (PESO/KG)	PERCENTAGE PROFIT (WP-LP)/LP
16.8273		12.25	0.373657
16.8273		12.43	0.353765
16.8273		12.46	0.350506
16.8273		13.30	0.265211
16.8273		13.83	0.216725
16.8273		15.05	0.118093
16.8273		13.32	0.263311
16.8273		12.54	0.341890
16.8273		11.70	0.438231
16.8273		12.57	0.338687
16.8273		12.25	0.373657
16.8273		12.43	0.353765
16.8273		12.46	0.350506
16.8273		12.84	0.310537
16.8273		12.90	0.304442
16.8273		13.12	0.282569
16.8273		13.65	0.232769
16.8273		12.70	0.324984
16.8273		11.75	0.432111
16.8273		10.11	0.664421
16.8273		10.49	0.604128
16.8273		9.57	0.758339
16.8273		9.43	0.784443
16.8273		10.05	0.674358
16.8273		11.57	0.454391
16.8273		10.92	0.540962
16.8273		11.17	0.506473
19.2809		12.51	0.541242
19.2809		12.55	0.536330
19.2809		12.74	0.513418
19.2809		13.52	0.426105
19.2809		15.03	0.282830
19.2809		15.76	0.223410
19.2809		16.57	0.163605
19.2809		16.26	0.185790
19.2809		16.68	0.155932

Source: Fiji Bureau of Statistics 1990-2011.

3.4. International and Global Pressures on Local Copra Prices

Finally, we obtained the global market prices for copra and compared this with the local copra price to determine how much of the copra price actually went to the exporters of the product. Table 5 shows the statistics for the percentage of the global market price of copra that went to the exporters of the product.

The average profit margin is 39.28% with a standard deviation of 17.53%. This means that of the prevailing global market price for copra, the exporters take an average of 39.28% and declares the remainder as the local market price for the commodity.

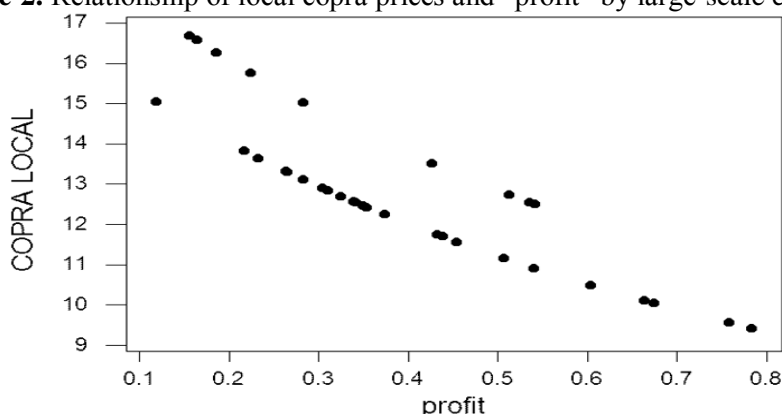
Table 6 shows the relationship of the global market price and local market price for copra. As expected, higher global market prices for copra imply higher local market prices. The global market prices explain about 37% of the local market prices for copra. It follows that the global market prices are the single most important determinant of local market prices of copra. Yet, because of the presence of exporters who extract roughly 39% profit from trading copra, the local market prices remain depressed.

Table-6. Relationship of global market price and local market price for copra

COPRA LOCAL = - 5.44 + 1.04 world copra				
Predictor	Coef	SE	T	P
Constant	-5.436	4.287	-1.27	0.214
World Copra Price	1.0404	0.2446	4.25	0.000
S = 1.535	R-Sq = 36.9%	R-Sq(adj) = 34.8%		

Figure-2. shows how the “profit” relates with the local market prices for copra:

Figure-2. Relationship of local copra prices and “profit” by large-scale exporters



4. Discussions

Over a million farmers are solely dependent on coconut production as their main source of livelihood. Yet, over the past decade, these farmers had suffered from the effects of low copra prices. Prices in the global market for the commodity had fluctuated and such fluctuations are also reflected in the local market pricing. However, we found that an average of about 39% of the global market price are actually absorbed by large scale exporters of coconut products leaving the local market price virtually depressed.

While the phenomenon of “profit for the exporters” plays the most crucial role in the local market pricing of copra, there are other factors that interplay to shape such local pricing scheme. The recent entry of a “substitute” oil, namely, oil obtained from oil palms explained 38% of the local market prices. We found tentative evidence that this “substitution” effect also has an impact on local market prices. Finally, the increase in supply of coconuts (and therefore coconut products) explained a mere 11% of the variance in the local copra prices.

Clearly evident in this paper is the need to review and revisit the coconut industry situation. In the Pre-Martial law and Martial law days, a re-structuring of the industry was done precisely to address the phenomenon of “low local market price” of coconuts and coconut products. The re-structuring worked for a while until the bureaucracy annihilated the well-intentioned effects of the re-structuring. The situation is akin to the power industry sector prior to the passage and implementation of the EPIRA law. A similar law would appear to be in order if we are to salvage what is remaining of the country’s coconut industry.

5. Conclusion

The local market prices of copra are subjected to the influence of: substitution, competition and global economic scenario relative to the coconut industry. The most feasible and closely related substitute commodity is the oil palm and the corresponding palm oil product. The single most important factor that determines the local market price of copra is the global market price or more precisely, the “profit” realized by large scale exporters of the commodity in the Philippines.

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