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Market Composition and Performance of Firms in Broiler, Chicken Egg, and Swine Production: Implications to the Philippine Competition Act

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Abstract

The Philippine Competition Act promotes free and fair market competition to improve market efficiency and protect consumer welfare. Thus, it is necessary to examine and assess the nature of competition in any industry. This was done by conducting the study of broiler, chicken egg, and swine industries using the market structure-conduct-performance approach. The degree of firm concentration, barriers to entry, profitability of production, return on investment, and share in every peso spent by the consumers were determined. Based on the analysis, markets for chicken egg and pork were fairly competitive while that of chicken meat was oligopolistic. Huge capital investment also showed to be a hindrance for greater competition in all the industries. Large share in consumer's peso was more likely an issue in the chicken meat market than in chicken egg and swine. Monitoring the behavior of large firms, reducing structural barriers, and increasing production efficiencies are necessary to improve markets of these industries thus ensuring a vibrant competition.

Keywords: *fair competition, market concentration, profitability, share in consumer peso*

Introduction

The livestock and poultry industry of the Philippine agriculture is a major income source of Filipinos. For the past two decades, the livestock and poultry industry contributed a combined 30% of the country's total gross value added (GVA) in agriculture and fishery (PSA 2017). The industry also creates opportunities for many Filipinos by providing employment and additional sources of income.

The industry serves as a major source of protein in the Filipino diet. Pork is the most consumed meat, with an average annual per capita consumption of 15.5 kilograms, followed by chicken meat (14.1 kilograms). Chicken egg is also preferred by consumers and has an average consumption of 4.0 kilograms per person per year (PSA 2018).

In any industry of a particular economy, fair market competition is vital in improving market efficiency and protecting the welfare of consumers. Competition stimulates innovation, productivity, and growth, which consequently improves wealth and reduces poverty (Godfrey 2008). To take advantage of these benefits, firms should ideally be operating in a perfectly competitive market. However, markets do not always work this way, especially when some firms conduct anti-competitive behaviors. To solve this problem, competition policies are implemented, which targets vibrant competition in the market.

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In the past, competition policy in the Philippines was fragmented into about 30 different laws including the Philippine Constitution, Revised Penal Code, Consumer and Price Acts, and other sector-specific regulations (Medalla 2017). However, penalties on anti-competitive conduct of firms were barely enforced in these policies. In 2015, the Philippine Competition Act (PCA) or Republic Act 10667 was enacted as the primary law for promoting fair market competition in the Philippines. This law aims to protect the welfare of consumers and improve the efficiency of competition in the markets by prohibiting anti-competitive agreements, abuse of dominant position, and anti-competitive mergers and acquisitions (PCC 2018).

The market structure-conduct-performance (SCP) approach is one of the most common tools used in assessing the nature of competition in an industry. The SCP approach characterizes the environment where firms compete, describes their behavior, and determines the outcomes of their conduct. The central hypothesis of the SCP paradigm asserts that there are causal relationships among the three, i.e., market structure determines firms' behavior or conduct while conduct in turn determines the market performance (Bain 1951 as cited by Lelissa and Kuhil 2018). This approach is useful in assessing the nature of competition in an industry because market structure predicts how firms would compete in the market while the overall outcome of their conduct can be evaluated through their performance (Porter 1981). Analysis of the market structure, conduct, and performance of firms were used across different industries of an economy, including rice (Briones 2019), poultry (Mohamed Shamsudin, and Latif 2013), air transport (Austria 2000), and pharmaceutical industry (Chong and Chan 2014).

Market structure determines the characteristics and relationship of buyers and sellers in an industry. It is characterized by the number of buyers and sellers, barriers to entry in the market, degree of product differentiation, extent of vertical integration, and diversification (Matyjas 2014). It can be classified as either perfectly competitive, monopolistically competitive, oligopolistic, or monopolistic. One of the indicators of market structure is the market composition or the degree of firm concentration. Markets with high firm concentration are inclined towards monopoly while markets with low firm concentration are likely to be more competitive. The market composition could indicate if market dominance exists in an industry and could serve as an initial basis for determining if there is a possible abuse of dominant position. Assessing market composition is also a useful tool in investigating possible significant collusion among large firms. Firms are more likely to collude in a highly concentrated market, thereby limiting the level of competition (Shaik 2009).

One measurable outcome of firms' behavior is their performance. Performance can be evaluated using various measures including price, product and allocative efficiency, product quality, technical progress, and profitability (Matyjas 2014). Firms operating in a competitive market take the price set by the market and have relatively lower returns, than in markets with low competition because the former have little or no control over the market (Lelissa and Kuhil 2018). A high market share of firms enables them to gain market power, which they could use to charge a price higher than the normal price established by competitive markets. Moreover, performance can also show the capability of producers in producing their products in the least possible cost, which are reflected in their price offered to consumers.

Market competition is essential in improving market efficiency and protecting consumer welfare. In order to promote this, it is necessary to make sure that the Philippine competition law is strictly enforced. Examining the markets and the nature of competition within these markets can help ensure that fair market competition is achieved. Using the SCP approach, this study aims to assess the market composition and performance of firms in broiler, chicken egg, and swine production in the Philippines and draw implications to the Philippine Competition Act.

Research Methodology

Both primary and secondary data were utilized to assess the market composition and performance of firms in broiler, chicken egg, and swine production in the Philippines. Firm concentration ratio was estimated to characterize the market composition, while cost and returns analysis, return on investment, and breakdown of consumer peso were used to assess the performance of firms, particularly the producers. Finally, the implications of firm composition and performance to market competition was also included.

The Concentration Ratio (CR4) of the top four producers of each product was estimated using production data submitted by companies to the Securities and Exchange Commission (SEC) and total volume of production published by the Philippine Statistics Authority (PSA). Market share was expressed as the percentage volume of production of each major player to the total volume of production in the Philippines. Due to limited availability of data, market shares were limited to the years 2013 to 2014. If the concentration ratio of the four largest firms is less than 40%, this indicates that there is relatively low market concentration and therefore the market is competitive. A high market power of firms and an oligopolistic market exist if the concentration ratio is between 40% and 90%. If the concentration ratio is greater than 90%, this could indicate that there is possible monopolization in the industry.

Case studies on the supply chain of broiler, chicken egg, and swine were conducted in the top producing and consuming provinces of these three commodities in the Philippines. Supply chain tracing activity was performed through focus group discussions (FGDs) and key informant interviews (KIIs) with industry representatives and major supply chain players in Pampanga, Bulacan, and Tarlac for the poultry products and in Iloilo and Cebu for swine. Cost and returns analysis was done to assess the profitability of producing these products. Data gathered included operating costs, volume and price of product sold, and investment costs. The final value of the product or the price paid by the consumer is shared by the different market intermediaries in the supply chain. To determine the farmer's share for each peso paid by the consumer for a product, its farm price was divided by its retail price. For each middleman's share, its marketing margin (i.e., selling price less buying price) was also divided by the final retail price.

Results and Discussion

In order to characterize the nature of competition of each industry, the market composition and performance of firms were assessed. The market composition was evaluated using the concentration ratio of the four largest firms in each industry. For broiler chicken and swine, performance of firms was estimated by each type of producer, i.e., backyard producer, commercial producer, and contract grower for broiler chicken; and backyard and commercial producers for swine. Only commercial producers were considered for chicken egg because most of the chicken egg producers in Pampanga were of the commercial type.

Broiler Industry

Market Composition

As of 2014, a total of 338 registered establishments were engaged into broiler production in the Philippines (PSA 2017). Its top four producers were San Miguel Foods, Inc., Bounty Fresh Group of Companies, Swift Foods, and Foster Foods (Table 1). San Miguel Foods, Inc. has significantly dominated the other major players in the broiler chicken industry, with a market share of 40%. In 2014, the Philippines' chicken meat production was about 1.1 million mt. Of this, San Miguel Foods' production was about 0.45 million mt. Bounty Fresh Group of Companies, which is comprised of Bounty Agro Ventures, Inc. (BAVI) and Bounty Fresh Foods, Inc. (BFFI), ranked second with a market share of 12%. The market shares of the other two major producers (0.05% to 0.6%) were relatively small. A little over one-half of the total chicken meat production in the Philippines comes from these two top companies. The combined market share of the top four companies is greater than 40% and indicates that the market for broiler chicken is oligopolistic.

Table 1. Concentration ratio of the four major broiler chicken producers, Philippines, 2014

Company	Market Share (%)
San Miguel Foods, Inc.	40.6232
Bounty Fresh Group of Companies	12.0532
Swift Foods, Inc.	0.0610
Foster Foods, Inc.	0.0583
Concentration Ratio (CR4)	52.7957

Sources of basic data: SEC, PSA

However, it should be noted that having large market share does not directly mean that the firms are violating the competition law as this could also promote efficiency in production in terms of operations and economies of scale. Rather, abuse of one's dominant position, which could restrict competition, is what is prohibited by the law. Evaluation of recent conducts of these large market players may be helpful to determine if they are engaged in anti-competitive behaviors. Neric *et al.* (2019) scanned the events in the broiler chicken industry and analyzed the trend in the retail prices of broiler chicken from 1990 to 2017. Based on the analysis, an upward shift in the trend of the broiler retail price was observed in 2002, which was also around the time of the entry of BAVI. Given that BAVI is a large broiler producer, its entry should have increased the supply of broiler chicken and thus, should have contributed to lowering of the retail price. Although this shift may be inconsistent with economic

principle, further investigation of possible conduct of anti-competitive behavior may still be needed for verification.

Moreover, the highly integrated operations of these two major broiler producers from input provision to marketing of their products is also worth noting. They produce their own inputs and are engaged into contract growing arrangements with broiler producers all over the Philippines. They are involved into toll dressing arrangements for processing and retail outlets for marketing their products. Aside from this, they sell inputs to commercial producers and other distributors and forge market tie-up with leading supermarkets and institutions. Their large-scale operations and use of advanced technologies increase their production efficiency, which makes it beneficial for consumers. But this may also pose as threat to smaller producers competing in the market and could possibly drive them out of the market if they will not be able to compete with larger producers. Based on the field interviews, market dominance of these two companies may still persist in the future because of their aggressiveness in increasing their productivity and expanding their business operations.

Performance of Broiler Firms

Cost and Return Analysis and Return on Investment

Table 2 shows the comparison of the costs and returns, including the investment costs, volume sold, and return on investment of the different types of broiler producers in Pampanga. Backyard producers produced around 257 kg of dressed chicken per year, while commercial producers and broiler contract growers produced around 115,140 kg and 983,373 kg of live chicken. Total operating cost was highest for commercial producers, followed by contract growers and backyard producers. Feeds accounted for 52% and 64% of the total operating costs of backyard and commercial producers, respectively; while depreciation cost (54%) and electricity, fuel, and water (30%) were the two major cost items for contract growers. On an annual basis, total returns were highest for contract growers and commercial producers, who sold large volume of live broiler chicken in the market.

Backyard producers had the lowest total investment cost (PhP 30,700), as compared to commercial producers (PhP 3,950,000) and broiler contract growers (PhP 66,750,000). In terms of return on investment, contract growers received the highest return on investment, which means that contract growers would earn around 20% for their investment in the business. Commercial producers and backyard producers, meanwhile, would earn around PhP 0.17 and PhP 0.15, respectively, for every peso invested in the broiler chicken production business.

Among the types of producers, contract growers incurred the lowest cost since they paid only for the operating costs. The bulk of production cost was shouldered by integrators, who required contract growers to use tunnel ventilated buildings. Tunnel ventilated buildings are more efficient in production, producing larger volume of broiler chicken and more cycles per year, as compared to conventional buildings. Although the use of tunnel ventilated buildings gave contract growers higher net returns and return on investment, this also entailed them larger operating and investment costs.

In the Philippines, large capital requirement is one of the structural barriers that limits entry of potential investors in the broiler industry and expansion of current smaller producers. This hinders the participation of additional competitors and vibrant competition in the industry.

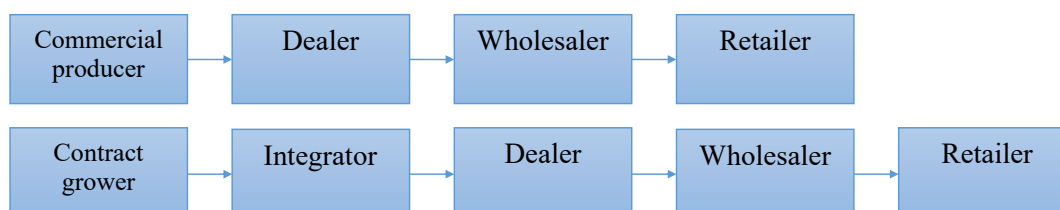
Table 2. Annual cost and return of broiler chicken production by type of producer, Pampanga, 2017

Item	Type of Producer (PhP/farm)		
	Backyard Broiler Producer	Commercial Broiler Producer	Broiler Contract Grower
Investment cost	30,700	3,950,000	66,750,000
Land	3,600	750,000	9,000,000
Housing & other related costs	2,600	2,500,000	56,000,000
Vehicle	24,500	700,000	700,000
Generator	0	0	1,050,000
Returns			
Sales of live broiler chicken	-	9,556,620	17,700,709
Sales of dressed chicken	35,986	-	-
Operating costs			
Cost of day-old chicks	5,120	2,640,000	-
Cost of feeds	16,500	5,700,000	-
Cost of veterinary supplies	608.00	252,000	-
Electricity, fuel and water	1,200	58,500	1,260,000
Labor	2,216	94,500	672,000
Depreciation	4,523	128,000	2,282,000
Dressing cost	1,344	-	-
Number of cycles/year	2	6	7
Volume sold/year, kg live	-	115,140	983,373
Volume sold/year, kg dressed	257.04	-	-
Total returns /year (PhP)	35,986	9,556,620	17,700,709
Total costs/year (PhP)	31,511	8,873,000	4,214,000
Net returns/year (PhP)	4,475	683,620	13,486,709
Return on investment (%)	15	17	20
Cost per kg, dressed	122.59	-	-
Cost per kg, live	-	77.06	4.29
Net income per kg, dressed	17.41	-	-
Net income per kg, live	-	5.94	13.71

Note: Mortality rate at 8.18%

Breakdown of Consumer's Peso

Chicken meat can either flow in two ways:



Almost the same flow exists for chicken meat produced by contract growers except that the chicken meat is gathered by integrators before they are bought by dealers (Tables 3 and 4).

Table 3. Breakdown of consumer peso in the supply chain of chicken meat (first product flow), 2017

Key Player	Farm Price (PhP/kg)	Buying Price (PhP/kg)	Selling Price (PhP/kg)	Breakdown of Consumer Peso
Commercial producer	94.86			0.68
Dealer		94.86	102.00	0.05
Wholesaler		102.00	120.00	0.13
Retailer		120.00	140.00	0.14

Unit: kg dressed meat; Conversion: 1kg live weight = 0.875 kg dressed weight

Table 4. Breakdown of consumer peso in the supply chain of chicken meat (second product flow), 2017

Key Player	Farm Price (PhP/kg)	Buying Price (PhP/kg)	Selling Price (PhP/kg)	Breakdown of Consumer Peso
Contract grower	15.42			0.11
Integrator		15.42	74.00	0.42
Dealer		74.00	102.00	0.20
Wholesaler		102.00	120.00	0.13
Retailer		120.00	140.00	0.14

Unit: kg dressed meat; Conversion: 1kg live weight = 0.875 kg dressed weight

For commercially produced chicken meat, around 68% of the total value of chicken meat paid for by the consumers was contributed by the farmer; while the 32% share was distributed to the dealer, wholesaler, and retailer, who performed mainly trucking, dressing, and marketing. On the other hand, contract growers contributed about 0.11 for each peso paid for by the consumers while integrators got around 0.42 share. The remaining 0.47 share was earned by the dealer, wholesaler, and retailer.

Both the commercial producer and tied-up contract grower and integrator received the largest share in the consumer's peso. Although the share of commercial producer is high, this does not serve as threat to market competition since there are several commercial producers in the industry and that the market shares of this type of producer are relatively small, thereby it cannot significantly influence the market. The combined shares of contract grower and integrator have an implication to market competition. Fair market competition may be at risk since there are only few integrators in the Philippines and their market shares are relatively high, which could have significant control over the market. Moreover, the smaller combined share of contract grower and integrator as compared to commercial producers reflects their more efficient operation, but also shows that they could potentially eliminate inefficient smaller producers in the market if they will not be able to reduce their costs and selling price.

Chicken Egg

Market Composition

There was a low market concentration of chicken egg production in the Philippines. The market concentration of the four major producers was estimated at about ten percent (Table 5). Based on this indicator, there is a competitive market in the chicken egg industry. Bounty Farms Incorporated, Universal Robina Corporation, Everest Farm Incorporated, and Venvi Agro-Industrial Ventures Corporation were the major producers of chicken egg in the Philippines.

The chicken egg market is composed of several commercial producers with relatively small shares in the industry. Its fairly competitive market is beneficial to consumers because this means that the price offered to them is determined based on competitiveness of firms and is not controlled by any large firm. Effective collusion may not also be possible as market shares are still low. However, this does not necessarily mean that chicken egg producers need not aim for improving their operation. For instance, Bounty Farms Incorporated has been using state-of-the-art technologies to improve their production efficiency. Given the company's aggressive improvement, this could help them gain a bigger market share in the near future. Other chicken egg producers should also aim for higher productivity to stay competitive.

Table 5. Concentration ratio of the major chicken egg producers, Philippines, 2013

Company	Market Share (%)
Bounty Farms, Inc.	5.0360
Universal Robina Corporation	2.5503
Everest Farm Inc.	2.5386
Venvi Agro-Industrial Ventures Corp.	0.3808
Concentration Ratio (CR4)	10.5057

Sources of basic data: SEC, PSA

Performance of Chicken Egg Firms

Cost and Return Analysis and Return on Investment

A commercial farm with around 50,000-layer heads inventory produced approximately one million trays of chicken egg per production cycle or around 581,567 trays on an annual basis, with each tray consisting of 30 eggs. Unlike in broiler chicken, which only takes at least 28 days per cycle, production of chicken egg is continuous up to 2 years. This also means that continuous supply of feeds is needed. In terms of the operating costs, the cost of feeds was the biggest cost item taking up around PhP 44,572,438 or 91% of the total operating costs paid for by the commercial egg producers (Table 6). After about six months of growing, layer chickens start to lay eggs every day and continuous income is then earned by the producers. For the commercial egg producer interviewed, the annual sales of chicken egg raked in around PhP 75,590,667. Annually, the commercial egg producers earned a net return of PhP 26,645,548 or an equivalent of PhP 45.82 per tray or PhP 1.53 per egg.

Chicken egg producers invest in land, buildings, and vehicles, with buildings taking up around 63% of the total investment cost. The return on investment for the commercial egg producers was around 65%, which means that these producers earned around 65% for their investment in the chicken egg business. Despite having a high ROI, it should be noted that chicken egg production is a high investment and high-risk business. The chicken egg producers were greatly affected by the incidence of Avian flu and the instability of the cost of feeds.

Chicken egg producers in the Philippines were mostly individual commercial producers. There were however, some integrators in the country who engaged in contract growing operations with chicken egg operators. Although risk was shared between the chicken egg contract grower and integrator, their potential to earn was also limited. For the first six months wherein eggs cannot still be gathered, the contract grower received a fixed income from the integrator, and then on the seventh month where the chickens started laying eggs, the income received by the contract grower was dependent on the egg collection. One of the provisions in the contract was that only small-medium (50 to 60 grams) and large (61 to 75 grams) sized eggs would be procured by the integrator. Jumbo-sized (>75 grams), pullets (<49 grams), and those with cracks were still bought by the integrator, but at marked down prices. This was a problem for the contract grower since about 5%-10% of the eggs harvested fall in the three categories mentioned. High profitability in chicken egg production may be attractive for potential rivals in the industry yet the large cost of investment and high risk also posed as barrier for free entry and exit in the market.

Table 6. Annual cost and return of chicken egg production of commercial producers, Pampanga, 2017

Item	Commercial Egg Producer (PhP/farm)
Investment cost	40,895,000
Land	13,500,000
Buildings	25,795,000
Vehicles	1,600,000
Returns	
Sales of chicken egg	75,590,667
Operating costs	
Cost of layers	1,365,000
Cost of feeds	44,572,438
Cost of veterinary supplies	551,880
Electricity, fuel and water	435,600
Labor	752,400
Veterinary and other professional cost	108,000
Depreciation	1,159,800
Total cost	48,945,118
Net income	26,645,548
Number of cycles/year	0.5
Volume sold/year, trays	581,467
Return on investment (%)	65
Cost per tray (PhP)	84.18
Net income per tray (PhP)	45.82
Cost per egg (PhP)	2.81
Net income per egg (PhP)	1.53

Breakdown of Consumer's Peso

For chicken eggs in Pampanga, the most common structure of product flow is from a commercial producer to a wholesaler and then to a retailer. For chicken eggs transported to other provinces, a consolidator exists between the commercial producer and the wholesaler, usually a cooperative, and they are in charge of sorting the eggs as well as the delivery to wholesalers in other provinces like Isabela and Cagayan⁵. The supply chain of chicken egg (Tables 7 to 11) involved only few market intermediaries. This minimized the marketing costs, which consequently improved the share of commercial producer in the consumer's peso. Across egg size, the share of commercial producer was at least three-fourths. Shares of wholesaler and retailer were relatively low at 4%-5% and 9%-18%, respectively.

The low share of distributors is beneficial to market competition since there are only few of them. This means that they do not have significant influence over the market. Meanwhile, the large share of commercial producer in the consumer's peso is still acceptable because there are several commercial producers in the industry. A large share does not necessarily mean that producers are able to control and charge higher price. As long as the shares are more or less the same across egg sizes, this still means that there is vibrant market competition.

⁵ The case of tracing eggs sold in other provinces was not considered in this analysis.

Table 7. Breakdown of consumer peso in the supply chain of chicken eggs (egg size = XL), 2017

Key Player	Farm Price (PhP/case)	Buying Price (PhP/case)	Selling Price (PhP/case)	Breakdown of Consumer Peso
Commercial Producer	1620.00			0.77
Wholesaler		1620.00	1728.00	0.05
Retailer		1728.00	2100.00	0.18

Unit: case (360 eggs/case)

Table 8. Breakdown of consumer's peso in the supply chain of chicken eggs (egg size = L), 2017

Key Player	Farm Price (PhP/case)	Buying Price (PhP/case)	Selling Price (PhP/case)	Breakdown of Consumer Peso
Commercial Producer	1512.00			0.76
Wholesaler		1512.00	1628.00	0.06
Retailer		1628.00	1980.00	0.18

Unit: case (360 eggs/case)

Table 9. Breakdown of consumer's peso in the supply chain of chicken eggs (egg size = M), 2017

Key Player	Farm Price (PhP/case)	Buying Price (PhP/case)	Selling Price (PhP/case)	Breakdown of Consumer Peso
Commercial Producer	1404.00			0.78
Wholesaler		1404.00	1476.00	0.04
Retailer		1476.00	1800.00	0.18

Unit: case (360 eggs/case)

Table 10. Breakdown of consumer's peso in the supply chain of chicken eggs (egg size = S), 2017

Key Player	Farm Price (PhP/case)	Buying Price (PhP/case)	Selling Price (PhP/case)	Breakdown of Consumer Peso
Commercial Producer	1332.00			0.82
Wholesaler		1332.00	1404.00	0.04
Retailer		1404.00	1620.00	0.13

Unit: case (360 eggs/case)

Table 11. Breakdown of consumer's peso in the supply chain of chicken eggs (egg size = XS), 2017

Key Player	Farm Price (PhP/case)	Buying Price (PhP/case)	Selling Price (PhP/case)	Breakdown of Consumer Peso
Commercial Producer	1296.00			0.86
Wholesaler		1296.00	1368.00	0.05
Retailer		1368.00	1500.00	0.09

Unit: case (360 eggs/case)

Swine

Market Composition

The swine industry in the Philippines was dominated by backyard farmers, producing at least two-thirds of the total national output, while the remaining one-third came from commercial producers. Registered firms involved in hog production in the Philippines was at 419 in 2014 (PSA 2017). San Miguel Foods Incorporated was the leading swine producer in the Philippines, with almost three percent share in the country's total output (Table 12). Universal Robina Corporation, Foremost Farms, and Cavite Pig City were also among the top producers of swine in the country. The aggregate market shares of the four major producers in 2014 was only 4.8%. This indicates that there is low concentration in the industry and that the market for swine is fairly competitive.

Table 12. Concentration ratio of the four major swine producers, Philippines, 2014

Company	Market Share (%)
San Miguel Foods, Inc.	2.8985
Universal Robina Corp.	1.1475
Foremost Farms	0.1779
Cavite Pig City	0.5797
Concentration Ratio (CR4)	4.8036

Sources of basic data: SEC, PSA

Market for swine may be fairly competitive. However, in the year 2001, a noticeable upward shift in the retail price of pork was observed by Neric *et al.* (2019). This was also the year when San Miguel Corporation acquired Pure Foods Corporation, a company involved in pork processing operations. While it may not be considered as direct collusion, the merger of these two companies increased the market power of SMFI, which is also considered a competition issue.

Performance of Swine Firms

Cost and Return Analysis and Return on Investment

Finisher hogs are fattened piglets mainly for meat consumption. They are sold in the market when their live weight is about 90 kilograms. Hog fattening can take up to six months per production cycle. Backyard and commercial producers have almost the same production operations except in their scale; wherein commercial producers raise at least 21 sow heads in their farms.

Inputs in the production of hogs were mainly attributed to feeds and the cost of stocks. For the backyard producers, the cost of feeds accounted for 51% of the total operating costs, while for the commercial producers, feed costs comprised 67% (Table 13). For both backyard and commercial producers, the stocks cost around one-fourth of the total operating costs. Backyard producers earned about PhP 156,968 annually for 3,600 kg of hogs produced while commercial producers earned around PhP 6,380,816 for producing 63,360 kg of hogs.

In terms of investment costs, the biggest expense item for both backyard and commercial producers was land, incurring a little more than 80% of the total investment costs. Commercial producers also invested around 18% of total investment for buildings. They may have higher investment costs than backyard producers, but the return on investment of commercial producers was also higher at 35% as compared to backyard producers at 12%. This means that backyard producers have no economies of scale. For the commercial producers, they earn around 0.35 for every peso invested in their hog production business.

Considering that they are both in a perfectly competitive market, scale of operation now plays a critical role in determining the profitability of production. The same with chicken meat and egg, this would also demand huge investments for swine producers. It would be more efficient if swine producers will engage into commercial production because they will be able to utilize more the large fixed cost of investment, particularly land and building.

Table 13. Annual cost and return of swine production by type of producer, Iloilo, 2018

ITEM	TYPE OF PRODUCER (PhP/farm)	
	Backyard Hog Producer	Commercial Hog Producer
Investment cost	1,308,000	18,450,000
Land	1,160,000	15,000,000
Building	68,000	3,350,000
Vehicle	80,000	100,000
Returns		
Sales of Live Hogs	424,800	14,952,960
Operating costs		
Cost of Stocks	64,000	2,252,800
Cost of Feeds	137,692	5,724,007
Cost of Veterinary Supplies	4,320	114,480
Electricity and Water	15,600	26,698
Labor	36,000	352,411
Depreciation	10,220	101,748
Net income	156,968	6,380,816
Number of cycles/year	2	2
Volume produced/year, kg live	3,600	63,360
Return on investment	12	35
Cost per kg, live	74.40	67.65
Net income per kg, live	43.60	50.35

Breakdown of Consumer's Peso

In Iloilo, hogs were either produced by backyard or commercial farmers but it undergoes the same marketing channel right after production. Backyard producers (Table 14) contributed around 71% of the peso spent by consumers on pork while commercial producers (Table 15) shared about 65% or around two-thirds for each peso spent by consumers. Trader's share differed depending on its source of hogs, i.e., 0.03 for each peso if bought from backyard producers and 0.10 if procured from commercial producers. These traders were the ones responsible for procuring live hogs from the farmers and for selling to wholesalers in the market. Wholesalers who contributed about 20% for each peso paid for by the consumers were the ones who pay for the slaughtering services and the cost of delivery of the carcass from the slaughterhouse to the market. Retailers, on the other hand, got a share of around 0.05 for each peso spent by consumers on pork.

The shares of backyard and commercial producers on every peso spent by consumers have an implication on consumer welfare. Production of commercial producers was more efficient, which enabled them to offer lower prices for its consumers. Moreover, the large share of wholesaler in the consumer's peso may have an implication to the swine retail segment. Comparing the number of wholesalers and retailers in the market, the number of wholesalers is fewer because wholesale distribution of swine requires larger amount of capital. This shows that the structure of the swine retail segment is oligopolistic, which also translates that competition in this segment is lower.

Table 14. Breakdown of consumer's peso in the supply chain of pork (first product flow), 2018

Key Player	Farm Price (PhP/case)	Buying Price (PhP/case)	Selling Price (PhP/case)	Breakdown of Consumer Peso
Backyard Producer	153.00			0.71
Trader		153.00	160.00	0.03
Wholesaler		160.00	205.00	0.21
Retailer		205.00	215.00	0.05

Unit: kg carcass; Conversion: 1kg live weight = 0.85 kg dressed weight

Table 15. Breakdown of consumer's peso in the supply chain of pork (second product flow), 2018

Key Player	Farm Price (PhP/case)	Buying Price (PhP/case)	Selling Price (PhP/case)	Breakdown of Consumer Peso
Commercial Producer	139.00			0.65
Trader		139.00	160.00	0.10
Wholesaler		160.00	205.00	0.21
Retailer		205.00	215.00	0.05

Unit: kg carcass; Conversion: 1kg live weight = 0.85 kg dressed weight

Conclusion and Recommendations

The primary goal of the Philippine Competition Act is to increase market efficiency and protect the welfare of consumers through effective market competition. Since the livestock and poultry industry is important in Philippine agriculture, it is necessary to ensure that there is vibrant competition in the industry.

The analysis showed that the markets for chicken egg and swine were fairly competitive with firms having relatively low market share in the industry. Oligopolistic market, however, exists for the chicken meat market. The dominance of the two large firms with vertically integrated operations poses threat to smaller producers as they may use their market power to eliminate smaller producers and limit the competition in the market. Concerned agencies may need to monitor the behavior of these large firms to prevent the conduct of anti-competitive behaviors.

For all the selected commodities, large capital investment was observed to be the most common barrier restricting competition. This was also associated with high risk in production especially in the case of chicken egg. This hinders the expansion of current smaller producers and entry of potential investors in the market. Programs intended for reducing structural barriers in the industry may be helpful to encourage more participants in the market for a more effective competition.

Large share of producers in the consumer's peso was observed for most of the product flows; however, efficiency in production was more likely a concern. Since there are several producers in the industry, their high prices do not necessarily mean that producers were able to charge higher prices as a result of high market power. Except for the case of chicken meat production, wherein the contract grower is tied-up with an integrator, competition issue may be present because there are only few integrators with relatively high market shares in the industry. Thus, there is a need to implement programs that would help to further increase their production efficiency to reduce production costs and consequently, the price of these commodities for the benefit of the consumers.

Acknowledgement

The authors would like to express their deepest gratitude to the Philippine Competition Commission for the funding support and their research team for the technical assistance. The funded project by the Commission served as the basis of this article.

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