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Do exchange rates influence US poultry exports?

Asirvatham Jebaraj* and Mayowa Olaoye

Agribusiness Economics, Southern Illinois University, Carbondale, United States.

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The United States is the world's largest poultry producer and exports about 18% of its total poultry production. With the global demand for poultry products projected to rise further, understanding key factors in world trade is essential for better trade. We study the influence of key demand factors, that is, exchange rate, poultry price and income of importing country on US poultry products. We focused on the top five importers namely, Mexico, Canada, China, Hong Kong, and Russia. A fixed effects model and a double-log multiple regression model are used. All three demand factors in a country were significantly associated with the quantity of poultry. Exchange rate negatively influenced US exports to the five countries. However, the magnitude, direction, and significance of these three variables varied for each country as shown in the country-level regression estimates.

Key words: Exchange rate, poultry trade, US poultry exports, poultry exports.

INTRODUCTION

The US poultry industry has been expanding over the years. Over the last ten years, the joint value of production from broilers, eggs, turkeys, and chicken has been over $40 billion in most years. In 2021, it was $46 billion, up from $35 billion in 2020. Likewise, US poultry exports have recorded considerable growth over the past two decades. Poultry exports have been above $4 billion for the last ten years and crossed $5 billion in 2021. Given the expanding market and potential growth, there is a need for more study on the key demand factors that could influence US poultry exports. The key factors focused on here are poultry price and, per capita income in the domestic market, and exchange rate.

This research focuses on countries that together account for over 60% of US poultry exports by value (Weaver, 2014). They include Mexico, Canada, China, Hong Kong, and Russia. Being one of the world's most efficient poultry producers, poultry imports by the US are inconsequential, comprising only 0.3% of local consumption of poultry.

Foreign poultry producers are unable to compete in the US market at cost or quality. Weaver (2014) finds evidence that this is due to the high productivity and economies of scale of the US poultry industry. These characteristics, according to the United States International Trade Commission, have led to the US accounting for approximately one-quarter of global poultry production, thereby becoming the world's largest poultry producer (Weaver, 2014).

The poultry industry in the US is very competitive and

*Corresponding author. E-mail: jebaraj@siu.edu.

#Both authors have contributed equally to this work.

adapts to consumer preferences, making it a very successful industry. A key factor that is attributed is its vertically integrated production that gives poultry processors high control over their product, resulting in high-quality poultry processing (Vukina, 2001). Consolidation over time has led to economies of scale. Furthermore, the poultry industry continually improves and advances in all stages of the manufacturing process via in-depth research and development to upgrade all segments of production, including breeding, disease control, feed compositions, and rearing/housing systems at grow-out facilities (Weaver, 2014).

High-quality production also keeps the US industry relatively immune to disease outbreaks elsewhere in the world. Such outbreaks in other parts of the world have boosted the exports of US poultry products. For example, following the outbreak of foot-and-mouth disease, there was a considerable increase in the consumption of chicken in Korea because many consumers replaced beef and pork with chicken (Piggott and Marsh, 2004). As a result, Korea imported more poultry products from the US. Another notable trend in Korea was the increasing number of chicken franchise chains, particularly in 2010 and 2011, owing to the demand by millennials for diverse branded chicken products (Prinsloo, 2018).

Since then, the per capita chicken consumption in Korea had only risen and continues to rise (Choi and Hinkle, 2018). Similar trends around the world have increased the demand for poultry products which has been met by imports from US. Consequently, exports are becoming more relevant for US poultry manufacturers (Capps et al., 1994). Relatively speaking, studies show that the safety of food has little effect on the demand for meat when compared to the price of the item or the income of the consumers (for example, Piggott and Marsh, 2004).

In view of such marked developments in the US poultry export market, there is a need to examine important factors that influence poultry trade. The factors influencing US poultry exports were study. Important factors considered in this study are foreign exchange rate, export price, and per capita Gross Domestic Product (GDP). Below we discuss the trade of poultry products followed by a discussion on the key variable in this study, the exchange rate.

International trade of poultry products

Poultry production across the globe can be categorized into commercial large-scale poultry, traditional village scavenging, and semi-commercial systems. Other unconventional methods include free-range and organic (Kitalyi, 1997). Traditional village-scavenging poultry is peculiar to developing countries and constitutes a substantial portion of poultry in the global flock or continent flock. This is also known as “backyard” or "farmyard” poultry in Europe and North America, where the market sizes have decreased, but are still noticeable. Traditional poultry significantly aids poverty alleviation and increased food security. However, there has been insufficient research to upgrade the efficiency of traditional poultry production (Kitalyi, 1997). It is evident that traditional poultry production is not efficient and has low productivity. As stated by Aboki et al. (2013), that the efficiency of family poultry can be improved by the adoption of innovations, medicines, and the provision of capital by the government. Hence, competition with commercial poultry production is relatively less in developing countries. Scanes (2007) states that semi-commercial production, which falls in between traditional and commercial poultry, lacks the infrastructure to improve poultry. Insufficient infrastructure and lack of financial capital constrained the ability of local poultry producers to meet the rising consumer demand, which drove the demand for imports from countries that have large-scale commercialized industries, such as the US.

The past two decades has seen poultry consumption rise up to the top spot in the world among livestock commodities (Miller et al., 2022). The US poultry sector, the world’s largest producer of poultry meat, exports 17% of its domestic production (Miljkovic et al., 2003).

During 2001 – 2021, the US poultry export market underwent considerable changes (Dohlman and Boussisos, 2022). US is currently the second largest exporter of poultry products with 26% of the global poultry trade. Poultry imports rose by 4% reaching 14.2 million metric tons in 2021. Consumption even in a low-income region, such as sub-Saharan Africa has increased from 0.33 million metric tons to 1.96 million metric tons. Latin American and Caribbean countries together make up the second largest importing region with 1.13 million metric tons. Russia’s imports, however, dropped by 1.22 million metric tons during that period. Geopolitical issues with the US did impact trade with a few countries, such as China and Russia. For example, there was a US poultry ban by Russia in 1996 and a drastic reduction in imports by China in response to avian influenza in 2000s (Zhuang and Moore 2015).

Miljkovic et al. (2003) suggested that trade liberalization (GATT, WTO, NAFTA) paved the way for the emergence of the US as among the top two world's major meat exporter. US poultry exports took off in the 1990s when the Russian Federation became the topmost importer of US poultry, accounting for 40% of US poultry exports. In 2001, the US poultry production was 42.43 billion pounds, thereby comprising 24 percent of the world's total output. Poultry exports by the US were 6.4 billion pounds, which constitutes close to 33% of the world poultry trade, of which 60% was shipped to consumers in Asia (Awokuse and Yuan, 2006). Mexico, China, Canada, and Hong Kong are equally important poultry markets for the US. Countries like Thailand, Brazil, and a few other large exporting countries compete with US in the world

poultry markets (Miljkovic et al., 2003).

Distance, which largely determines transportation cost, is not included in this study because we do not have data on the amount of poultry exports from each port. The ports are spread across the country, making it difficult to have a precise distance estimate. Previous studies by Atkins and Bowler (2016) showed that trade barriers of various kinds tend to impact US poultry exports.

Existing research on exchange rates and exports

Exchange rate is among the most important factors determining international trade. A stronger dollar reduces the price of foreign goods to US consumers. Consumers in that foreign country, on the other hand, must pay more for US goods.

Thus, a stronger dollar boosts demand for imports and decreases the demand for exports. A weaker dollar has the reverse effect, that is, foreign consumers have to pay less, thereby, increase demand for exports. Studies have shown that exchange rates do considerably impact trade for most commodities. A study on Thailand's agricultural trade showed a significant impact of the exchange rate on rice, tapioca, poultry, and fisheries but not on natural rubber (Jatuporn et al., 2016).

Exchange rate volatility is also found to have some influence on trade. The extent of the impact depends on the nature of the response to risk, availability of capital, forward contracts, and the time horizon of the trader (McKenzie, 1999).

The general hypothesis is that high variability in the exchange rate leads to instability in the prices of US agricultural products in terms of the local currency in the importing countries abroad. In response, a risk-averse trader would consider whether to trade or not. A USDA's Economic Research Service report observed that about 25% of the adjustments in US agricultural value were due to fluctuations in exchange rates over the years. Awokuse and Yuan (2006), for example, found that the exchange rate volatility had a negative association with US poultry export, but this relationship was not statistically significant. High exchange rate volatility caused a substantial decrease in the demand for US products and local consumption in foreign countries (Shane and Leifert, 2007).

Miljkovic et al. (2003) studied the impacts of GATT and NAFTA agreements on exchange rate pass-through. The "Pass-through" relationship in this sense describes the proportional relationship between local currency import prices and exchange rates (Devereux and Engel, 2002). The results showed that incomplete exchange rate pass-through exists for many countries. They specifically quantified the impact of relative exchange rates on US poultry, beef, and pork export prices among the largest meat-importing nations. Country-specific factors such as varying demands for product quality, domestic policies, and income effects were also estimated.

DATA AND METHODS

Panel data at the country level was collected for the period 1993-2012. Mexico, Canada, Russia, Hong Kong, and China were chosen as they are the largest importers of US poultry products. All variables are monthly. Monthly quantity and value data for US poultry products for January 1993 to December 2012 for crucial export destination countries were obtained from the Food and Agriculture Organization (FAO) and used to deduce export prices (FAO, n.d.). Income level reflects purchasing power of consumers in the importing country. Quarterly per capita GDP is used as a proxy for income as has been used in the literature (for example, Awokuse and Yuan, 2006). Quarterly GDP information were obtained from International Financial Statistics, while that for China was obtained from the Federal Reserve Bank of St. Louis (FRED), which they sourced from the Organization for Economic Co-operation and Development (OECD) (2017).

Exchange rates were obtained from World Bank and the International Monetary Fund (IMF) international finance statistics data (World Bank, n.d.). The quantity of US poultry exports is the volume of US poultry products shipped to each of the five countries considered in this study. This differs across the countries, and it might be a result of varying demand and supply factors in those countries (Figure 1). Average poultry exports from US during this period increased in the order, with Canada as the highest followed by China, Mexico, Hong Kong, and the least to Russia. On average imports, China is the top importer (88 million tons) followed by Russia (51 million tons). Among these countries, Canada has the smaller share in terms of quantity. Figure 1 also shows variability in poultry imports from US by these countries. Russia showed higher variability. Canada and Mexico showed an increasing trend while Hong Kong reduced imports in the latter years of the study period.

Awokuse and Yuan (2006) described the exchange rate as the price of a currency in terms of another currency and it is probably the single most cogent variable in determining the level of trade. The exchange rate for each is reported in the local currency as obtained from the World Bank and was converted to equivalent US dollar value. All countries except Canada have a low exchange rate, ranging from 0.1211 to 0.1373 (Table 1). A Canadian dollar, in the study period, equals 0.796 US dollars. The standard deviation suggests that all countries except Russia did not vary much between 1993 and 2012.

The average exchange rate ranges from highest to lowest in the order from Canada, Russia, China, Hong Kong, and least Mexico (Figure 2). This depicts how strong the currency of the countries relative to the US dollar is. The Canadian dollar appears to be the strongest, while the Mexican peso seems to be the weakest in comparison to the US dollar. The Russian ruble has a higher standard deviation. A closer examination shows that where the exchange rate dropped in the late 1990s, and thereafter remained about the same for the next 12 years.

The mean export price to countries ranges from highest in Canada, followed by Hong Kong, China, Mexico, and least in Russia (Figure 3). Finally, the average per capita GDP across the countries ranges from highest in Canada, followed by Hong Kong, Mexico, and Russia, and the least in China. The monthly exchange rate is shown in Figure 1 for all countries, and the value is calculated as:

$$Exchange\ Rate(US\ dollar) = \frac{1}{Exchange\ Rate\ Local\ Currency}$$

According to the Organization for Economic Co-operation and Development, total GDP depicts the standard measure of the value added created through the production of goods and services

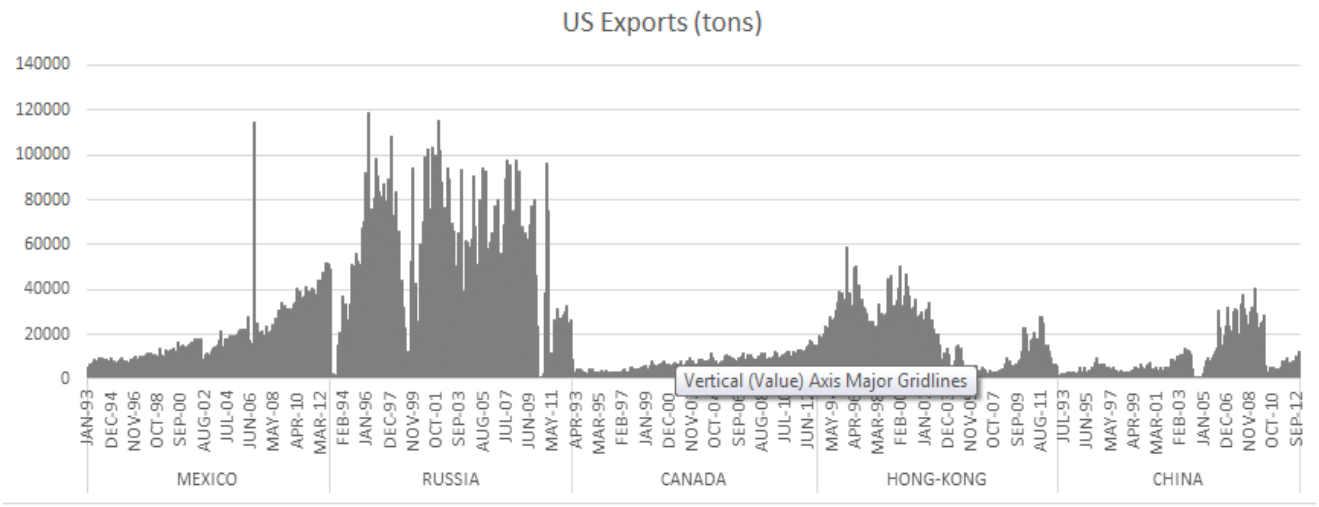

Figure 1. Monthly US poultry exports to select countries, Jan 1993-Dec 2012.
Source: Food and Agriculture Organization (FAO) of the United Nations.

Table 1. Descriptive statistics across the 5 countries between 1993-2012.

Country	Quantity US poultry export (Mean/SD) (tons)	Exchange rate (Mean/SD) ($)	Export price (Mean/SD) ($)	Per capita GDP (Mean/SD) ($)
Canada	7,304 (3,332)	0.7966 (0.1249)	2,609 (382)	30,538 (442)
China	89,722 (8,942)	0.1313 (0.0161)	824 (146300)	515 (195267)
Hong Kong	19,005 (12,707)	0.1287 (0.0004)	934 (286)	9,644 (12,172)
Mexico	18,776 (13,004)	0.1211 (0.0661)	802 (171)	7,113 (1,899)
Russia	51,132 (28,999)	0.1373 (0.2451)	778 (289)	1,367 (1,066)

Figures in parenthesis are standard deviation.
Source: Authors.

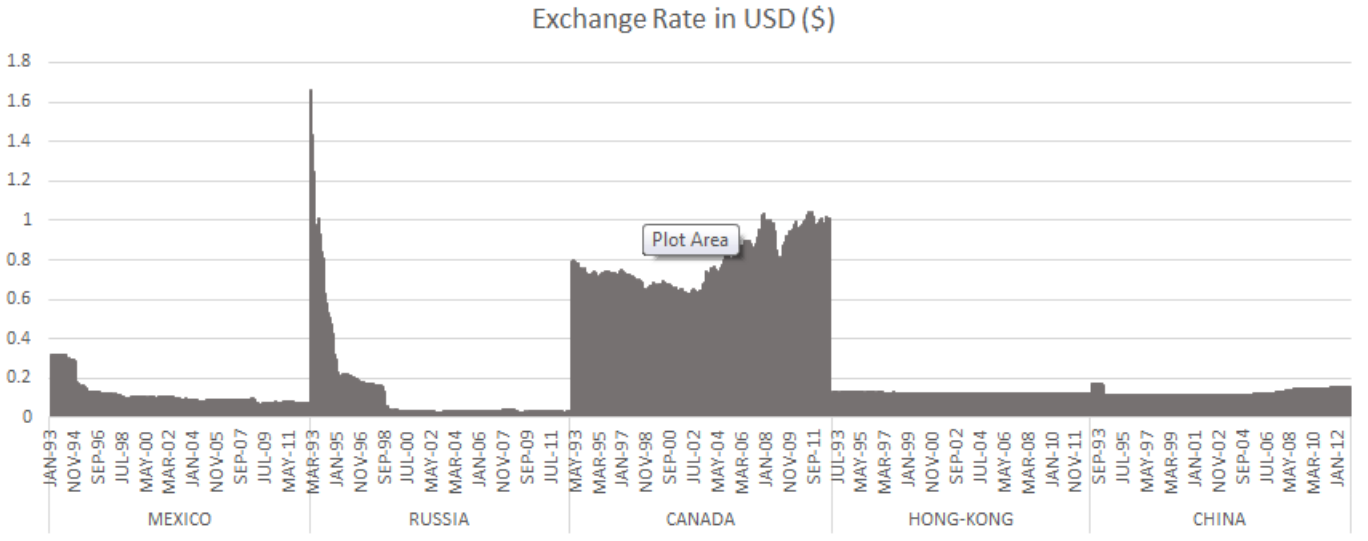

Figure 2. Monthly Exchange rate of the countries in US Dollars (USD), Jan 1993- Dec 2012.
Source: World Bank (WB) and International Monetary Fund (IMF).

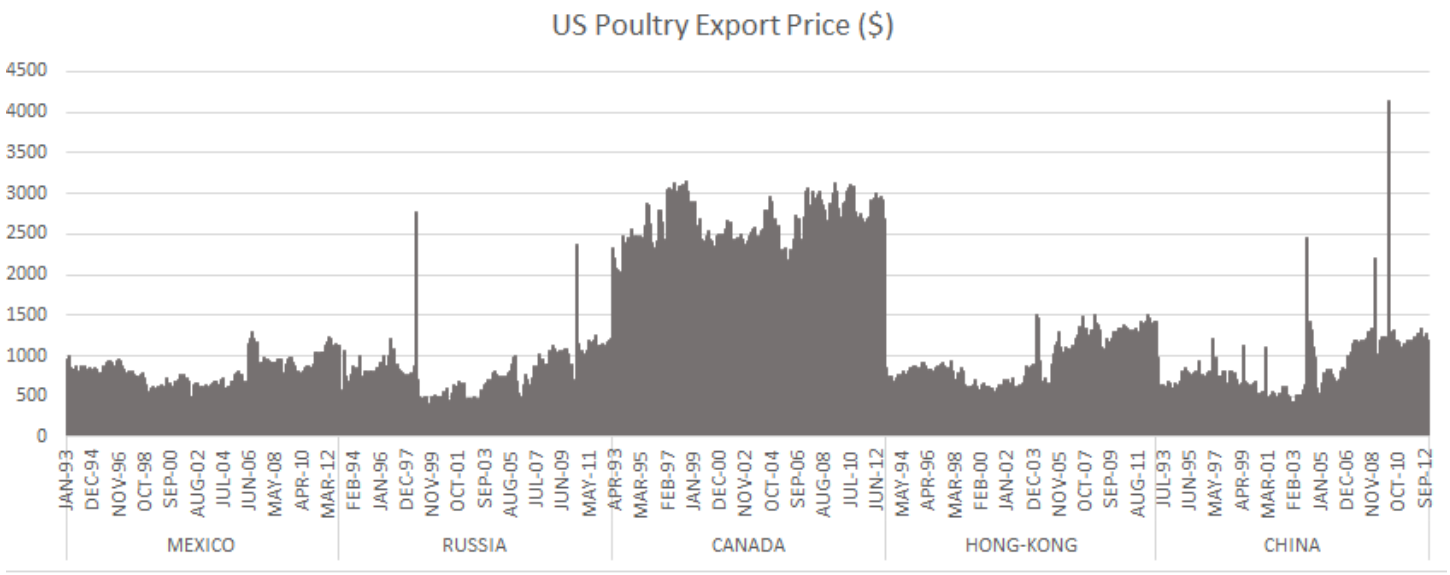

Figure 3. Monthly export price of US Poultry to their trading partners, Jan 1993- Dec 2012.
Source: Food and Agriculture Organization (FAO) of the United Nations.

produced by a country in a period. GDP per capita is the most commonly used proxy for income. A previous study by Awokuse and Yuan (2006) found that foreign income has significant positive effects on US poultry trade. Total GDP data were recorded in local currencies.

GDP per capita was obtained by dividing the total GDP of a specific year by the population of people living in that country during that specific year. The resulting values which were in the national currency of the countries were then converted to the US dollar by using the corresponding exchange rate. Although per capita GDP only measures the economic output of a country, it does not directly depict the income level but gives a good guestimate on the aggregate productivity measure of the entire population in a country.

$$Per\ Capita\ GDP = \left({}^{Total\ GDP}/_{Population}\right) ExchangerateUSD$$

Export price depicts not only the price paid by the countries to US poultry exporters but also captures the transportation and associated costs between US and its trading partners. It was derived by dividing the export value by the total quantity, thereby comprising cost, insurance and freight, called c.i.f. The FAO Foreign Trade barriers report explains how these factors and others are put in place and how they affect the import and export trade between the US and different countries. Awokuse and Yuan (2006) used a similar approach to deduce export price.

Empirical model-1: Aggregate double-log model multiple regression model

Where a non-linear relationship exists between the independent and dependent variables in a multiple regression model, it is the usual practice to logarithmically transform the variables (Benoit, 2011). To address skewness and heteroskedasticity, all the variables were converted to natural logarithms. The full model is shown below, equation -1.

There are three specifications: first is a univariate regression with exchange rate variable, and second a multiple regression with exchange rate, per capita GDP, and export price. Thirdly, country dummy variables are added to the second specification. The third specification is also a fixed-effects model at the country level.

$$\ln Q_{it} = \ln\beta_0 + \ln\beta_1 ER_{it} + \ln\beta_2 P_{it} + \ln\beta_3 G_{it} + e_i,$$

where Q_{it} = Quantity of poultry exports to a country i, where i = Canada, China, Hong Kong, Mexico, or Russia; t represents specific month and year, where t = Jan 1993, Feb 1993, …, Dec 2012. ER_{it} = Exchange rate in country i and at time t. P_{it} = Export Price of poultry to a given country and at a given time; G_{it} = Per capita GDP of a given country and at a given time; Equation (1) is modified to include country fixed effects.

$$\ln Q_{it} = \ln\beta_0 + \ln\beta_1 ER_{it} + \ln\beta_2 P_{it} + \ln\beta_3 G_{it} + \sum(\beta_{4i} D_i) + e_i$$

D_i is a dummy variable for country *i*, where *i* = Mexico, Russia, China, or Canada.

Dummy variables for each country are included to capture time-invariant country-specific factors. To avoid linear dependency, Canada was used as the baseline because it has a similar economic and consumer environment as that in US, and as a result, was dropped out in the regression. Therefore, the estimates of the country dummy variables are to be interpreted relative to Canada. This is synonymous to Knetter's Model which was used by Miljkovic et al. (2003) to identify the potential effects of changes in relative exchange rates on meat export prices.

Empirical model-2: Double-log regression model for each country

To compare the individual country effect, a double-log regression was run for each country. This would help assess the impact of the variables specific to the country, especially to see if those are different or not. Variables in each of the country-level models were significant.

We also ran a univariate regression to examine the effect of the exchange rate on the quantity of US poultry exports to each country, without the inclusion of other control variables, such as per

Table 2. OLS estimates of double-log model on US poultry exports.

Variable (%)	Model 1	Model 2	Model 3
Exchange rate (log)	-0.481*** (0.030)	-0.582*** (0.054)	-0.226*** (0.054)
Export Price (log)	-	-0.156* (0.086)	-0.287*** (0.099)
Per capita GDP (log)	-	0.194*** (0.023)	0.252*** (0.047)
China	-	-	0.196** (0.233)
Hong Kong	-	-	0.365** (0.156)
Mexico	-	-	0.433 (0.167)
Russia	-	-	1.618** (0.225)
F-stat	255***	116***	105***

Single and double asterisks (*) denote statistical significance at the 0.10 and 0.05 levels respectively.
Source: Authors.

capita GDP and export price. We also retain the country fixed-effects to capture country-level factors that may influence poultry exports, which helps assess any correlation of these factors with exchange rate.

RESULTS AND DISCUSSION

Double-log model regression provides elasticities making it easier to interpret the coefficient estimates. It's worth reemphasizing that the data is monthly and hence the estimates represent monthly changes. Since all the variables were converted to natural log, they will be interpreted in percentages. Firstly, we discuss the estimates of equation-1 mentioned above presented in Table 2. Note that the sign of the exchange rate is consistently negative in all three models, which is consistent with a previous study by Awokuse and Yuan (2006). Including country-level fixed effects more than halve the exchange rate estimate, probably, because other variables now capture the variation in the export amounts. Estimates for the country dummy variables represent the difference in the dependent variable between the country and the omitted one, i.e., Canada. In other words, it needs to be interpreted relative to Canada. In terms of magnitude, in response to a 1 percent increase in a country's exchange rate, there will be a decrease of 0.22 percent in the quantity of US poultry exports. Consistent with results found by Eenoo and Purcell (2000), the price of US poultry has a negative impact on the quantity of US poultry exports. That is, for every percentage increase in the US poultry price, the quantity of US poultry exports will decline by 0.287%.

As expected, and in line with research by the FAO (2009), per capita GDP was found to have a positive impact on poultry exports, implying that for a one percent rise in per capita GDP, poultry exports will also rise by 0.252%. The quantity of US poultry exports to Mexico is 0.030 tons higher than that of Hong Kong. The quantity of US poultry exports to Russia is also 0.544 tons higher than that of Hong Kong, while US poultry exports to China are 0.073 tons lower compared to that of Hong Kong. Finally, the quantity of US poultry exports to Canada is 0.159 tons higher than to Hong Kong. Overall significance test revealed a high F-statistic of 105 suggesting model significance in explaining the variations in the quantity of US poultry exports.

The exchange rate is statistically significant and, thereby, influences US poultry exports. Per capita GDP has a significant impact on the quantity of US export as well. The price of US poultry has a statistically significant effect on the quantity of US poultry exports. The dummy variables showed that the quantity of US poultry exports to Russia and Canada are statistically significant, and thus, their quantity of poultry imports from US differs from Hong Kong's poultry imports from the US. Meanwhile, the quantity of US poultry exports to Mexico and China are not statistically different from the quantity of US poultry exports to Hong Kong.

When comparing all three specifications in Table 2, the results are similar in direction of the relationship but vary in magnitude, particularly for exchange rate and export price. Including country-level dummy variables considerably changed the estimates of the other variables which indicates that the relationship among these important trade variables vary by country.

Double-log multiple regression model for individual countries

Running regressions on individual countries showed different relationships between exchange rates and US exports (Table 3). Notably, the exchange rate and per capita GDP variable has a statistically significant association with the quantity of US poultry exports to each of the five countries analyzed here. The exchange rate variable is significant for all countries and the magnitude varies from -0.35 for Russia to a high +75.9 for Hong Kong. The magnitude is below 2 for all countries except Hong Kong. Furthermore, the relationship

Table 3. OLS estimates of double-log model on US poultry exports for individual countries.

Variable (in log)	Canada	China	Hong Kong	Mexico	Russia
Exchange rate	1.672*** (0.222)	-1.052* (0.634)	75.886*** (11.894)	-0.658*** (0.053)	-0.347*** (0.097)
Export Price	0.255 (0.255)	0.186 (0.179)	-1.788*** (0.131)	0.586*** (0.084)	0.044 (0.346)
Per capita GDP	0.123** (0.053)	0.614*** (0.098)	-0.296*** (0.081)	1.058*** (0.075)	-0.291* (0.159)
F-stat	45***	22***	94***	337***	5.3***

Single and double asterisks (*) denote statistical significance at the 0.10 and 0.05 levels respectively.
Source: Authors.

Table 4. OLS estimates of double-log model on US poultry exports controlling for trend.

Variable (%)	Model 1	Model 2	Model 3
Exchange rate (log)	-0.460*** (0.031)	-0.560*** (0.052)	-0.109* (0.059)
Export Price (log)	-	-0.188** (0.096)	-0.440*** (0.103)
Per capita GDP (log)	-	0.189*** (0.024)	0.088 (0.047)
China	-	-	0.196** (0.233)
Hong Kong	-	-	0.365** (0.156)
Mexico	-	-	0.433 (0.167)
Russia	-	-	1.618** (0.225)
Year	-0.460*** (0.018)	0.0046 (0.0062)	0.033*** (0.007)
F-stat	255***	116***	105***

Single and double asterisks (*) denote statistical significance at the 0.10 and 0.05 levels respectively.
Source: Authors.

between the exchange rate and US exports is negative for China, Mexico and Russia, whereas it's positive for Canada and Hong Kong. The variables are in logs as in the earlier models, hence a percentage change in exchange rate decreases trade by less than a percent for Mexico and Russia but just about a percent decrease for China. Those with an increase in US exports in response to, however, Hong Kong showed a 75% increase in response to a percentage change in the exchange rate.

Export prices

Export prices had a significant association only for select countries, namely Hong Kong and Mexico. In contrast, the coefficient was significant in the general regression that included all the major importers of US poultry products. A percentage increase in the export price of Mexico increased the quantity of US poultry exports by 0.59 percent whereas it decreased US exports to Russia by 1.79%.

Similar to the Exchange rate variable, the per capita GDP was significant for all countries. The estimated size ranged from -0.29 for Russia to +1.06 for Mexico. Hong Kong and Russia showed decrease in receiving US exports when per capita GDP increased, whereas Canada, China, and Mexico increased US exports. R-square does show considerable variability in how much the quantity of US poultry exports is explained by per capita GDP, exchange rate, and the poultry price.

CONCLUSION AND IMPLICATIONS

This study investigated if the exchange rate impacts poultry exports from US to the top five trading countries. All the models employed in this study (except that involving China) confirm our hypothesis that the exchange rate might significantly impact the quantity of poultry exports (Table 4). We also find that the exchange rate has an inverse impact on the quantity of US poultry exports, although the magnitude is not large. Previous studies found similar results. For example, on a panel of 186 bilateral trading partners, Rose et al. (2000) observed a small indirect impact of exchange rate on poultry exports. DeGrauwe and Skudelny (2000) also found a statistically significant indirect effect of exchange rate on trade in the European Union, as did Dell'Ariccia (1999).

Individual country models showed that Canada and Hong Kong stood out as the only two countries whose exchange rates had a positive relationship with poultry exports. This is consistent with Langley et al. (2000), who found that exchange rates had a positive impact on

Thailand's exports of poultry, but not on the overall agricultural exports. However, this is contradicted by a few other studies (Anderson and Garcia, 1989; Awokuse and Yuan, 2006) that found a negative effect of the exchange rate on US poultry exports.

This study sheds more light on the relationship among poultry trade variables. Overall, the exchange rate shows mixed results. However, a closer look suggests that the relationship is negative with middle-income countries and positive with higher-income countries. The export price in equivalent dollars also shows mixed results, however, the significant price coefficients show the opposite sign of that of the exchange rate coefficient. The exchange rate coefficient for Hong Kong is +76 but the export price is -1.8, whereas, for Mexico, the exchange rate is -1.7 and the price is +0.6.

The negative association between exchange rate and poultry exports holds even in a country-level fixed effects model. The significance of country-level dummy variables could be because of some country-specific factors, such as varying demand for product quality or domestic policies (Miljkovic et al., 2003). It is also likely that policies, such as special status owing to trade agreements could have created an environment for price discrimination (Miljkovic et al., 2003).

This sounds logical because trading partners offer special trade deals either through NAFTA or GATT to favored nations. These special trade deals may provide greater incentives to trade with those favored nations. These policies could impact the coefficient of exchange rate in the model. Miljkovic et al. (2003) argued that the US became one of the world's crucial meat exporters in the era of trade liberalization.

The inverse relationship observed in this case depicts that the export market responds to lower prices. Rising promotion and customer awareness during an era of low prices might help maximize poultry exports. Eenoo and Purcell (2000) stressed the impact of the periodic low US poultry prices of the 1990s in the export market, during which time the export market responded sharply to the low prices. They argued that increased consumption can be induced only if there is a price decline.

In most models per capita, GDP had a direct impact on poultry exports. Thus, per capita GDP, a common proxy for individual income used in the literature, can be said to be an important demand driver of poultry exports. Therefore, US poultry exporters should focus more on trading partners whose economies where incomes are rising. US poultry exporters could also focus on higher quality US poultry meat. A strategy like this may also favor the domestic poultry producers in developing countries with low per capita GDP and income because they will have less competition. This might not be true for all developing economies, because competition has been argued to drive efficiency.

Currency devaluation policies could also impact the quantity of US poultry exports. It could be that some of the countries evaluated in this study are expanding domestic poultry production. Coleman and Payne (2003) found that between 1990 and 2001, Mexico's poultry industry was the fastest growing sector of the country's livestock production, with production rising to a yearly average of about 9 percent. Findings like these are vital for exporter pricing schemes, export market expansion, and estimating the impact of currency devaluation on US poultry exports (Miljkovic et al., 2003). The R-square of the above model revealed that exchange rate, export price, and per capita GDP can only explain 38.2 percent of the variability in the quantity of US poultry exports. This implies that there might be other variables that need to be considered in future research.

It must be noted that the variables were in dollars or made dollar equivalent. The implication is that the relationships among variables in currencies would also be impacted by monetary policies or currency devaluation. For example, currency devaluation took place in Mexico during the 1990s (Eenoo and Purcell, 2000). Due to growing population, sub–Saharan Africa is expected to be the highest importer of poultry accounting for 19% of the global trade.

According to an ERS study, the regions exhibiting the strongest projected increases in population are developing countries and emerging markets, including sub-Saharan Africa (up 27%), the other Middle East region (up 18%), Mexico (up 21%), Latin America and the Caribbean (up 36%), and China and Hong Kong (up 37%).

CONFLICTS OF INTERESTS

The authors have not declared any conflicts of interests.

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