TO BAN OR NOT TO BAN? IMPLICATIONS OF THE RECENT BAN ON POULTRY IMPORTS BY GHANA

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Abstract

Due to the Avian Influenza outbreak in Europe and Russia, Ghana has imposed an import ban on affected countries. This paper analyses the potential effects of this partial ban on Ghanaian chicken producers and agricultural trade. Due to the growing support for a total ban on poultry imports by various value chain actors, we also analyse the impact of a complete ban on Ghana's poultry imports. We apply an integrated method covering General Equilibrium and typical farm analysis. Our findings show that the partial ban has a lower effect on trade and the whole economy compared with the total ban. Nevertheless, the effect of a total ban on domestic producers is more significant. Moreover, a total import ban increases production mainly for the large-scale integrated farms in Ghana.

Keywords

Import ban, chicken, imports, poultry, Ghana

1 Introduction

Poultry meat is an important source of animal protein in Sub-Saharan Africa (SSA). Increasing urbanization and income combined with rapid population growth has led to a growing demand for animal products, including poultry meat in many African countries (MOTTET AND TEMPIO, 2017). Per capita consumption of poultry meat in SSA has substantially increased from 1.5 to 2.1 kg annually (equivalent to an increase of 40% of per capita consumption) between 2000 and 2017 (ASANTE-ADDO AND WEIBLE, 2019).

According to FAO statistics, poultry imports by many African countries are rapidly increasing, and are much higher than the local production (FAOSTAT, 2020). Thus, the self-sufficiency rates for many African states have been sharply dropping during the last decades. In response, the enaction of import bans of poultry products has become a famous policy instrument among the African policymakers as they aim to protect domestic production and increase self-sufficiency in the long term (AKUNZULE ET AL., 2009; JOHNSON, 2011; NAGGUJJA ET AL., 2020). For instance, in the last two decades, Cameroon, Nigeria, and Senegal have experienced partial or total bans on importing poultry products. Faced with the elevated international competition, in 2002, Nigeria was one of the first countries in West Africa to enact a ban on poultry imports to safeguard local products (ANDAM ET AL., 2017). Following a succession protectionist trade policy beginning in the 90s, Cameroon restricted poultry imports in 2005, mainly due to concerted lobbying from producers (JOHNSON, 2011). In the same year, the Senegalese government implemented a ban on importing poultry products to prevent the Highly Pathogenic Avian Influenza (HPAI) from entering the country (HOLLINGER AND STAATZ, 2015). Although the Senegalese government initially imposed the ban as an official attempt to prevent an Avian Influenza outbreak, the ban continues to exist until today.

Ghana has been dependent on poultry imports for more than a decade (ASANTE-ADDO AND WEIBLE, 2019). The European Union (EU) is the major supplier of poultry meat to Ghana, just ahead of the United States of America (USA) and Brazil (ZAMANI ET AL., 2021). However, the dominance of EU imports will most likely change as Ghana recently imposed an import ban on poultry product imports from the Netherlands, Germany, Russia, Denmark, and the United Kingdom from November 2020. According to an official letter written by the Ghanaian Ministry of Food and Agriculture on 10 November 2020, the ban was prompted by the recent

outbreak of Avian Influenza subtype H5N8 in Europe. This is not the first time that Ghana has imposed a partial ban. During the 2006-2007 Avian Influenza outbreak, Ghana applied a partial ban on imports from less important trading partners (AKUNZULE ET AL., 2009; JOHNSON, 2011). Thus, the ban policy was not so prohibitive as poultry imports continued to increase. However, the recent imposition of a ban on one of the most important trade flows between Ghana and the EU combined with the implementation of the EPA (Economic Partnership Agreement) tariff reductions might affect relative prices of food in Ghana and thus may influence production patterns.

With this study, we contribute to the existing literature on agri-food trade policies in several ways. To our knowledge, this is the first empirical study investigating the potential implications of the recent partial import ban implemented in November 2020. This analysis primarily aims to elaborate on the effects of the partial import ban on the poultry sector and the whole economy of Ghana and its major trading partners. The study further analyses the potential impact of a total ban as an alternative policy option. So far, there have been several studies in the agricultural economics literature using Computable General Equilibrium (CGE) models to analyse import bans in different agri-food markets (e.g., MCDONALD AND ROBERTS, 1998; PHILIPPIDIS AND HUBBARD, 2001; RODRIGUEZ ET AL., 2007; CHATTERJEE ET AL., 2016; BOULANGER ET AL., 2016; BANSE ET AL., 2019). We also use a CGE to analyse trade flows but combine this method with the results of semi-structured interviews, a Delphi study, focus groups, and farm-level analysis. This hybrid framework allows us to incorporate stakeholders' views regarding the policy and to have a comprehensive representation regarding the spillover effects of the ban on macroeconomics and farm-level variables simultaneously.

The rest of the paper is structured as follows: In Section 2, we review the existing literature on ban policies in the agri-food sector. In Section 3, the method framework of our analysis is presented. Finally, in Section 4, we summarize our results and drive the possible policy implications.

2 Literature review on agri-food trade bans

According to the World Trade Organization (WTO), an import ban is prohibited for member countries. However, exceptions are considered under defined conditions such as safeguarding mechanisms, developing countries exemption, human, livestock, and plant health-related issues (see GATT 1994 article XI). Several papers in the literature discuss the potential consequences of trade bans in various contexts. For instance, the effects of an import ban on Genetically Modified Organism (GMOs) products (e.g., ANDERSON ET AL., 2005; PHILIPPIDIS, 2010; HENSELER ET AL., 2013), a ban to prevent livestock outbreaks (e.g., MCDONALD AND ROBERTS, 1998; PHILIPPIDIS AND HUBBARD, 2001; RODRIGUEZ ET AL., 2007; CHATTERJEE ET AL., 2016; KUTLINA-DIMITROVA, 2017), and the political-induced import bans (e.g., BOULANGER ET AL., 2016; BANSE ET AL., 2019) are analysed. Although the existing literature on import bans varies in terms of case studies and potential consequences, mainly CGE-based models are applied.

CHATTERJEE ET AL. (2016) report the economy-wide evidence on the EU's import ban on several GM foods produced by India using a modified GTAP (Global Trade Analysis Project) model. Following the EU's ban, the simulation shows that the domestic supply of GM food rises, which changes the trade balance. Due to reductions in the domestic price, the extra GM product supplies might be absorbed by domestic consumers, and finally, the effects on them are minor. In another work by HENSELER ET AL. (2013), the potential impact of a trade ban on soybean exports from Argentina, Brazil, and the USA to the EU are simulated. Using an integrated approach of general and partial equilibrium models, the interaction between agricultural and biofuel sectors to the trade ban is considered. The findings predicted a high feed cost in response to the trade restriction scenario, which affects poultry and pork sectors the most. To conserve forest resources and environmental degradation, BOSELLO ET AL. (2013) analyse the possible

consequences of pending EU legislation to ban illegally harvested wood and wood products trade in the EU market. Using a modified CGE model, the author points out that the unilateral EU trade ban may effectively remove illegal timber from the international market. However, this policy may promote illegal logging countries to increase secondary wood production as their products become more competitive (due to price increases) after implementing the ban.

The 2014 Russian agri-food imports ban is one of the recent cases in the literature. In response to the Ukraine conflict and to "protect the national security of the Russian Federation", Russia imposed a temporary ban on agri-food imports from the EU, the USA, Norway, Canada, and Australia (BANSE ET AL., 2019). In this regard, BOULANGER ET AL. (2016) apply a modified CGE model to analyse the short-run consequences of the Russian imports ban. As the findings of the study show, the EU compensates for the ban-related negative shock majorly by Intra EU trade, while Russia ensures the highest income loss due to the ban (approximately €3.4 billion). In a similar context, KUTLINA-DIMITROVA (2017) reports that the impact of the Russian agri-food ban is negligible on total EU exports using the GTAP model. This limited change may be evidence of a strong "cushioning" effect through redirecting the banned product to the EU internal market. In a recent paper, BANSE ET AL. (2019) show that removing the Russian food import ban may result in a minor change in the agricultural sectors of both Russia and the EU.

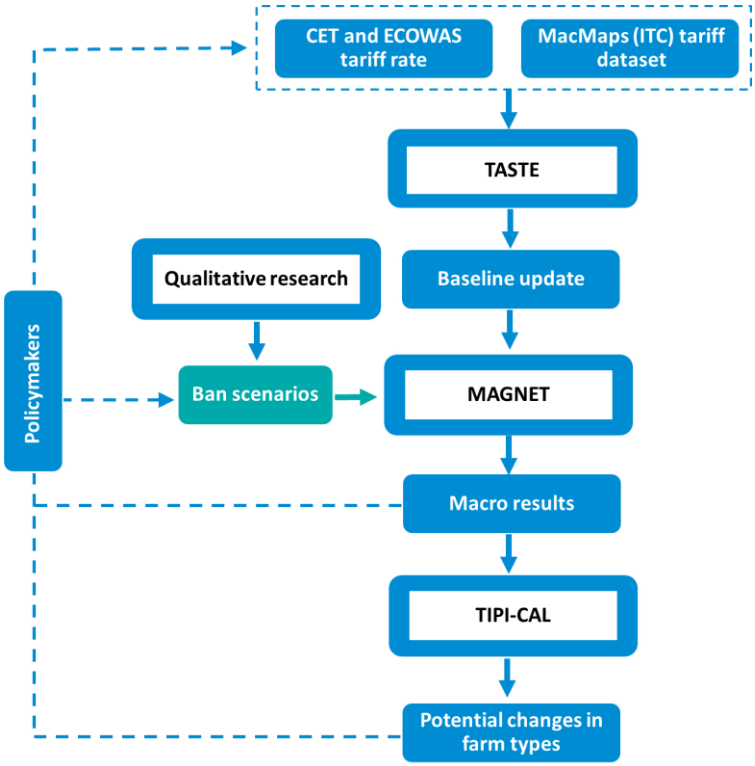
According to the existing literature, the final effects of a partial ban depend on various factors. From a trade perspective, the partial trade ban may affect bilateral trade flows by reallocating market shares in favour of non-banned countries (NICITA, 2008). Thus, the total effects on the domestic market are highly influenced by the share of new competitors and changes in total imports following the partial ban implementation. Exciting literature in the context of western African countries has majorly emphasized the increase of domestic production in response to a total ban (e.g., KILLEBREW ET AL., 2010; GIZ, 2018) while domestic prices increase and consumption decreases (DINDÉ ET AL., 2017). ANDRIAMANANJARA ET AL. (2009) show that illegal trade is growing due to the ban and that 90 percent of Benin's poultry imports are re-exported informally to Nigeria. Additionally, a ban on inputs into poultry production leads to an increase in maize prices. Maize prices tripled from 2007 to 2008 and left many poultry producers unable to provide sufficient feed quantities (KILLEBREW ET AL., 2010).

3 Model Framework

Figure 1 presents the process by which our methods are applied. It is based on connecting the qualitative and quantitative analyses for identifying the most important challenges in the poultry value chain and simulating the potential effects of policy decisions on macro and micro levels. Firstly, the tariff dataset is adjusted according to our research question. Secondly, two ban scenarios on the poultry sector of Ghana are designed. The first scenario is a 'partial ban' scenario that is based on the decision by Ghanaian policymakers to impose a partial import ban from November 2020. While the second scenario is a 'total ban' scenario that builds on qualitative research results (semi-structured interviews, focus groups, and Delphi study). Of which, the qualitative research was conducted in order to gather insights on the perceptions of poultry value chain actors regarding the option of banning poultry meat imports. Although, the partial ban is implemented in response to the Avian Flu outbreak, the total ban policy majorly protects domestic producers against increasing imports of poultry meat.

Thirdly, the effects of the scenarios are simulated by using the MAGNET (Modular Applied General Equilibrium Tool) model. Based on the simulation results for production, the potential changes in different farm types are estimated. Continuing the loop, the simulation results provide policymakers with a basis to readjust or modify the trade policies. The scenarios used in this analysis and different parts of the following flowchart are described in detail in the section below.

Figure 1: Policy assessment flowchart



Source: Own.

3.1. Qualitative research

In line with AKUNZULE ET AL. (2009), semi-structured interviews were used to collect data from key informants knowledgeable of the poultry value chain in Ghana. Semi-structured interviews were used because they enabled key informants to freely express their points of view, allowing the researchers to gain an in-depth understanding of the various issues related to the poultry value chain. The interviews were conducted in Accra, Kumasi, and the Eastern region. A total of 17 key informants were interviewed. The key informants included input suppliers (hatcheries, feed manufacturers, and veterinary product suppliers), poultry producers, processors (slaughterhouses), and distributors (retailers, wholesalers).

Additionally, the Delphi method was used to identify and rank the challenges facing the value chain identified through an in-depth literature review. This was done to understand the extent to which poultry meat imports are perceived as a challenge. The Delphi study was composed of a heterogeneous group of experts, including researchers, poultry producers, policymakers, input suppliers, feed millers, hatcheries and slaughterhouses. The Delphi study was conducted from November to December 2020 in two rounds of emails. In the first round, the questionnaire, which was composed of two questions, was sent to the experts. The first question requested the experts to judge the importance of 14 challenges facing the value chain through a five-point Likert scale with '5= most important', '4= important', '3= fairly important', '2= less important' and '1= least important'. The second question was an open-ended question that requested the experts to identify and judge the importance of other challenges not included in the initial list. The first-round responses were then analysed using the mean, standard deviation and Kendall's coefficient of concordance and fed back to the experts in Round 2.

3.2. MAGNET model

A CGE model of the world economy known as MAGNET was used to estimate the potential impacts of two ban scenarios on imports and domestic production. MAGNET is based on the GTAP model and the GTAP database with a particular focus on the global agricultural sectors (WOLTJER ET AL., 2014). MAGNET has been extensively applied by researchers and public institutes to assess the economic implications of agri-food trade policy scenarios (e.g. BANSE ET AL., 2008; BOULANGER AND PHILIPPIDIS, 2015; HELMING AND TABEAU, 2018). WOLTJER AND KUIPER (2014) provide a detailed description of MAGNET. For this analysis, the latest version of MAGNET is applied that disaggregates poultry products from other livestock products.

In a first step, a baseline is created that includes the phasing in of EU trade agreement between the year 2020 and 2030. The underlying trade policy and macroeconomic assumptions are documented by HASS ET AL. (2020) in more detail and updated for this analysis. In order to consider Ghana's trade policies, the Common External Tariff (CET) is implemented, and the EPA trade agreement between the EU and the ECOWAS (Economic Community of West African States) is included in the baseline. As a result, the model approach includes tariff protection for all countries worldwide based on the 2017 protection structure, and by 2030, the data for the EU and ECOWAS countries have been adjusted according to the gradual implementation of trade agreements. For the update of the protection structure, we apply the Tariff Aggregation and Simulation Tool for Economists (TASTE) developed by HORRIDGE AND LABORDE (2008) and updated by PELIKAN ET AL. (2020). Building on the baseline, two scenarios are created:

a) Partial ban (PB): an import ban for poultry products from the Netherlands, Germany, Russia, Denmark,[1] and the United Kingdom.
b) Total ban (TB): an import ban for different poultry products from all trading partners.

In the context of CGE models, the import ban scenarios have been implemented in different ways. In the traditional approach, the ban is defined by increasing tariff rates to prohibitively high levels which in turn causes the reduction in imports (ANDERSON ET AL., 2005; HENSELER ET AL., 2013; ANTIMIANI ET AL., 2014). However, it may not provide a precise representation of the poultry ban in Ghana. Alternatively, PHILIPPIDIS (2010) and BOULANGER ET AL. (2016) formulate the self-imposed ban on the utility function by reducing the domestic demand for imports. We implement the import ban with the help of the import-augmenting technical change variable. This parameter, i.e. ams_{irs} captures the rate of decay on imports of commodity or service i from country r imported by country s. Equation 1 presents the effect mechanism of ams_{irs} on trade flows (CORONG ET AL, 2017),

$$qxs_{irs} = -ams_{irs} + qim_{irs} - \varepsilon_i[pms_{irs} - ams_{irs} - pim_{is}] \quad (1)$$

Where qxs_{irs}, qim_{irs}, and pms_{irs} respectively denote the percentage change in the exports (qxs) and imports (qim) of commodity i from country r (source) to country s (destination) and domestic price (pim) in country s of imports from country r. pim_{is} presents a market price of import i in the country of destination. ε_i is the elasticity of substitution among imports in the Armington structure. To implement the ban, we change the closure of the model. *qxs* is changed to an exogenous variable and *ams* to an endogenous variable. In this way, we can reduce exports to Ghana by 100% by implementing a shock on *qxs*.

[1] Since Denmark is not disaggregated in our baseline, we remove it. According to the UN Comtrade, exports from Denmark to Ghana are minor.

3.3. Typical farm approach

The typical farm approach was used to construct empirically grounded farm data sets by applying several qualitative research methods that include farm observations, semi-structured interviews, and focus groups. The constructed "typical farms" were then used to analyse the economic perform of broiler chicken farms in Ghana. We used this approach to link the results of the MAGNET model to the farm-level variables. Thus, it allowed us to better interpret the results of MAGNET. As stipulated by CHIBANDA ET AL. (2020), we applied the approach in a series of the following steps:

Step 1. Identified the most important broiler production regions and broiler production systems through an in-depth literature review and consultation of local experts.

Step 2. Selected broiler farms with characteristics that represent the identified typical broiler production systems. Farm data was then collected from the farms.

Step 3. Focus groups were used to typify the individual farm data collected in Step 2 and to construct typical farms through recalibrating the farm data. A total of three focus groups were held, one for each identified production system. Each focus group was composed of ten participants who included five producers, three extension officers and two local researchers.

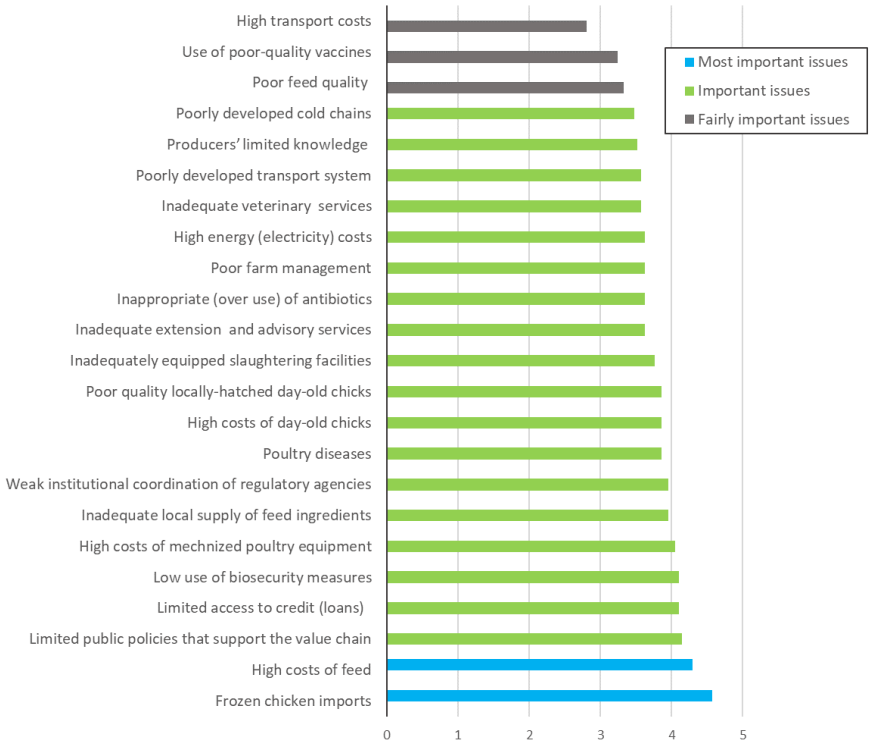
Step 4: The Technology Impact Policy Impact Calculations (TIPI-CAL) model was used to analyse the typical farm data. TIPI-CAL is a computer-based policy impact assessment tool used in farm economic analysis as it allows a detailed analysis of farm-level variables (KRESS AND VERHAAGH, 2019).

CHIBANDA ET AL. (2020) provide an in-depth explanation of how the typical farm approach is applied.

4. Results

Figure 2 presents the key challenges facing the poultry sector that were identified and ranked through the Delphi study. The results show that frozen chicken imports are perceived to be the most important challenge facing the poultry sector. Furthermore, most of the poultry industry experts interviewed indicated that poultry imports are hindering the development of the sector. The experts suggested that a total ban on imports would be beneficial for the sector and the wider economy. Therefore, these findings were the basis for us to run the total ban scenario in the next step.

Figure 2: Ranking of key challenges facing the poultry sector



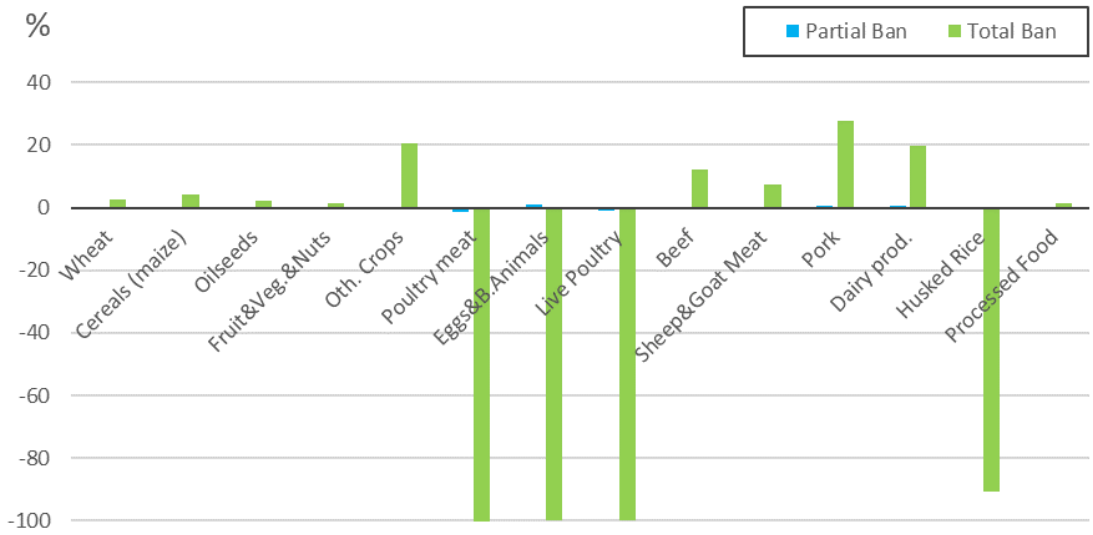
Source: Own calculations.

In the CGE model framework, we implemented the ban scenarios on imports of poultry meat, live poultry and eggs & breeding animals subsectors. According to the UN COMTRADE DATASET (2019), the imports of breeding animals to Ghana are minor. Thus, the egg & breeding animals subsector mainly shows the changes in the egg imports. Of which, according to industry experts, the majority of the imported eggs are hatching eggs.

The effects on Ghanaian imports resulting from the partial and total ban scenarios are displayed in Figure 4. While the partial ban only results in small changes in total imports, the total ban scenario will also affect other sectors. Here, maize, oilseed, and crops (containing seeds for fodder plants) imports increase significantly when a total ban on poultry products is enforced. These products are used as inputs into poultry production. Through the typical farm approach, we estimated the proportions of key poultry feed ingredients used by typical broiler farms in Ghana. The feed used by these farms is composed of maize (57%-60%), soy meal (20%-24%), wheat bran (7%-12%), fishmeal (2-5%), broiler concentrate (5%), and palm kernel cake (2,5%).

Additionally, Figure 3 reveals that import demand shifts to other animal products like dairy, pork, and beef. Since the initial value of these imports is low, the additional quantities that cross the borders are also not high. An interesting result is a decrease in rice imports. According to OMARI ET AL. (2013), rice and poultry (chicken) are often consumed together, and thus, a decrease in imported poultry consumption might also lead to a decrease in rice consumption.

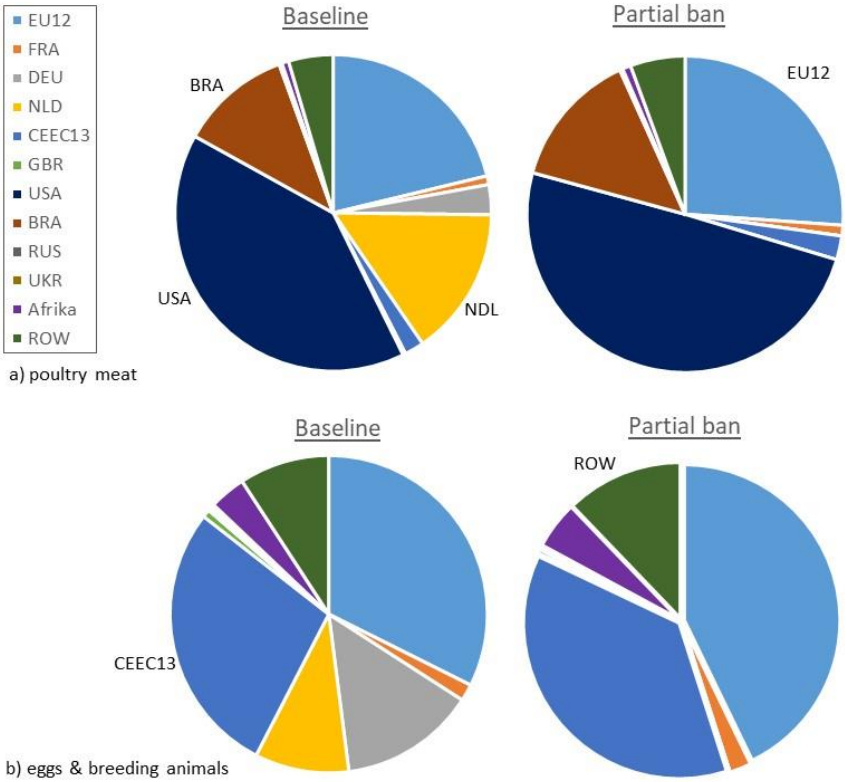
Figure 3: Change in Import Values relative to the Baseline in the year 2030



Source: Own calculations.

Why is the effect of a partial ban so small? Although the imports from the Netherlands, Germany, United Kingdom, and Russia to Ghana become zero, the total imports remain relatively constant. As shown in Figure 4, the market shortage in the Ghanaian poultry market due to the partial ban is majorly compensated by the imports from Brazil and the US. Thus, the shares of these countries increase after the partial ban, while total imports remain relatively constant. As shown, our findings display a similar pattern for the egg market. However, the partial ban causes the share of African, Asian, and other European countries to rise significantly in the total imports of egg products. The results from the model are consistent with the findings from the semi-structured interviews. According to hatchery managers that were interviewed, the partial ban will most likely increase the number of imports of hatching eggs from non-banned countries like Belgium, Turkey, Egypt, Cote de Ivoire, South Africa, and Brazil.

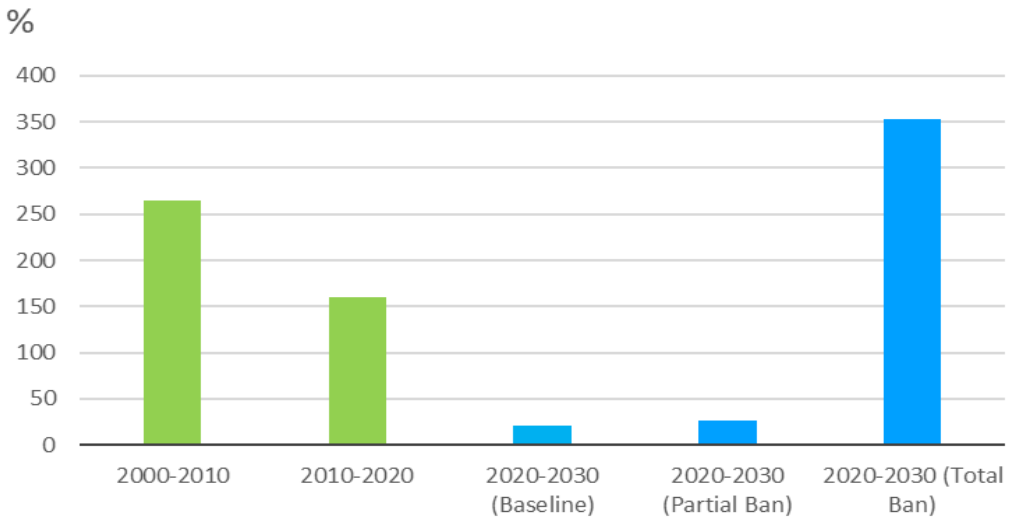
Figure 4: Changes in the countries import shares to Ghana due to the partial ban



Source: Own calculations.

Figure 5 presents the change in production based on historical data and supplements this with the results of the simulations. Between 2000 and 2010 the poultry production in Ghana increases by 264%. In the next decade, the increase is 159%. In our simulation, we focus on the period between 2020 and 2030. Although we consider GDP-growth rates and population growth in our baseline, we project an increase until 2030 by only 20%. Growing demand in Ghana is mainly met by additional imports. Moreover, a partial ban resulting from the Avian Influenza would increase production by 27% by 2030. However, if the total import ban as suggested by the experts were implemented, then production could increase by 354%. Is a production increase of this magnitude possible? Which producers will benefit from this? An answer to these questions is provided by the analysis of typical farms. According to AMANOR-BOADU ET AL., (2016), broiler farms that are fully operational in Ghana can run up to 6.5 production cycles per year. However, Table 1 shows that all three typical broiler farms run only around three production cycles per year. Producers who participated in the typical farm focus groups revealed that due to the low-priced frozen chicken imports, locally produced broiler meat is only readily marketable during peak demand periods (i.e., Christmas, Easter, and Eid Al-Fitr). These findings are in-line with the studies conducted by AMANOR-BOADU (2016) and RVO (2020), which conclude that the Ghanaian broiler market is seasonal as production is done mainly for the festive holidays. Therefore, a total ban on imports would result in current producers easily increasing their production by 117% by running 6.5 cycles per year. The rest of the increase could be accounted for by new producers attracted to poultry production or an increase in the number of birds per cycle by current producers.

Figure 5: Percentage changes in production of poultry meat in Ghana



Source: Dataset 2000-2020, USDA (2019); Baseline and Scenarios, own calculations with MAGNET.

According to ASANTE-ADDO AND WEIBLE (2019), besides the poultry meat imports being more affordable than local chickens, consumers in Ghana buy more chicken imports than local chickens because the imports are available in cut pieces or as dressed chickens that make preparation more convenient. Table 1 presents the characteristics of typical broiler production systems that we identified. The results show that large-scale integrated broiler farms are the only farm type currently slaughtering their chickens. Therefore, they are better positioned to take advantage of the total ban and satisfy the demand for processed chickens. Hence, similar to Senegal (ARNOLDUS ET AL. 2020), the Ghanaian poultry sector will most likely be dominated by a few large-scale integrated farms after a total ban.

Table 1: Characteristics of typical broiler production systems in Ghana

	Small-scale commercial	**Medium scale commercial**	**Large-scale integrated**
Farm size	< 5.000 birds per year	5.000- 20.000 birds per year	> 20 000 birds per year
Feed source	Commercial feed-mills		Operate their own feed-mills
Day-old chicks	Exotic breeds that are often imported	Exotic breeds that are often imported	Farms often own a hatchery and produce their own exotic breeds.
Marketing	Live birds sold in local communities, live markets and to small restaurants	Live chickens are sold in live markets and to traders.	Chickens are often slaughtered on the farm, and sold to retailers and restaurants.
Number of cycles per year	3.72	3.00	3.00

Source: Own calculations.

Finally, it should be noted here that the focus of this analysis is on producers. In the overall economy, import bans are often associated with welfare losses. In this case, GDP would fall by 165 million USD as a result of a total ban. The decline in GDP as a result of the partial ban would only be 19 million USD. We have not quantified the benefits of preventing Avian Influenza. However, it can be assumed that an outbreak can be prevented at relatively low costs if imports are banned only from specific countries. When interpreting the results of a total ban,

however, it should be borne in mind that, in reality, illegal imports are often recorded when a country imposes a ban. This would reduce the positive effects on producers and would have an additional negative effect on consumers, as cold chains are more frequently not adhered to in the illegal trade.

5. Conclusion

This study analyses the recent ban on poultry imports from some European countries and Russia by Ghana. To capture the spillover effects of the ban on different stakeholders, we apply a hybrid method integrating Computable General Equilibrium (CGE) and typical farm analysis. The effects of the recent partial ban are compared with a total ban policy. In contrast to the total ban policy, imports of corresponding products do not change significantly due to the partial ban. This pattern is driven by a "cushioning" effect through trade diversion by increasing the import shares of other competitors to the food market of Ghana. The partial ban causes the export shares of US and eastern European countries to increase in the sectors of "poultry meat" and "eggs & breeding animals" of Ghana, respectively. Our simulation suggests that the partial ban comes with a relatively low cost (19 million USD) for protecting the domestic market from Avian Influenza. Although the total ban leads to a more significant increase in production by domestic producers than the partial ban, it has higher costs for the whole economy. Additionally, our typical farm analysis shows that the large-scale integrated broiler farms are better positioned to receive the positive effects of total ban and meet the demand for processed chickens. Considering the significant level of cross-border trade in West Africa, the ban policy may increase the risk of illegal trade. However, we have no information on illegal trade to estimate the potential effects of the ban. Another limitation of our analysis goes back to the long-term structural effects of the import ban. It might be difficult to relax a ban again after a long-term implementation, as the producers may not be competitive on the world market anymore. This may be a venue for future analysis.

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