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**Trade Liberalization: The Effects of Free Trade Agreements on the
Performance of the Dairy Sector**

par

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Trade Liberalization: The Effects of Free Trade Agreements on the
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SOMMAIRE

Cette recherche porte sur la libéralisation du commerce dans le secteur agricole et agroalimentaire. Premièrement, elle vise à identifier les effets des accords de libre-échange sur la performance du secteur laitier sur une période de 20 ans, soit de 1990 à 2009. Deuxièmement, cette recherche détermine si le type d'accords de libre-échange, soit multilatéral ou bilatéral, a un impact sur ces effets. Finalement, est-ce que les effets diffèrent selon le statut économique des pays étudiés, soit entre pays développés et en voie de développement ?

Une revue de la littérature révèle que les effets des accords commerciaux sur la performance du secteur agricole diffèrent selon les auteurs. De plus, plusieurs de ces recherches portent soit sur un pays spécifique, une région spécifique ou des accords spécifiques. Cette recherche couvre plusieurs pays incluant des pays développés et en voie de développement ainsi que tous leurs accords de libre-échange touchant le secteur de l'agriculture. Cette revue de littérature a aussi permis de proposer une définition du terme « performance » pour le secteur agricole à l'aide de la notion des avantages comparatifs. Tel que suggéré par Latruffe (2010), plusieurs indicateurs de compétitivité, soit la productivité, la balance commerciale d'un secteur, les prix aux producteurs et le « Revealed Comparative Advantage » sont utilisés dans cette recherche. Cette méthode permet de mesurer la performance selon plusieurs dimensions.

Un modèle économétrique utilisant des données de panel permet de capter les effets des accords de libre-échange sur les indicateurs de performance du secteur laitier grâce à un échantillon de 41 pays. Les variables dépendantes sont les indicateurs de performance. Les variables indépendantes sont les accords de libre-échange multilatéral et bilatéral des pays de l'échantillon. Enfin, les variables de contrôle sont les ressources naturelles et humaines des pays analysés, la taille et la croissance de

leur marché domestique, le niveau de mécanisation de leur secteur agricole, leur structure de gouvernance, leurs politiques agricoles domestiques, leur taux de change et leur niveau de corruption.

Les résultats montrent que les accords de libre-échange ont un effet positif et significatif sur la productivité et la balance commerciale du secteur laitier pour les pays ayant un avantage comparatif dans ce secteur. De plus, les accords multilatéraux ont un effet plus positif et significatif que les accords bilatéraux. Le secteur laitier des pays développés semblent plus bénéficier des accords de libre-échange que ceux des pays en voie de développement. Donc même si les accords de libre-échange représentent des opportunités de commerce pour les exportateurs de produits laitiers, les responsables politiques devraient être consciencieux dans le choix de types d'accords et de pays membres.

Aucune relation statistique n'a été trouvée entre les accords de libre-échange et les prix aux producteurs, ainsi qu'entre les accords de libre-échange et le « Revealed Comparative Advantage ». Ceci pourrait être attribuable au fait que le modèle ne contrôle pas la qualité des produits ni les facteurs reliés à la demande. Ces facteurs pourraient avoir une influence sur la différence de prix entre producteurs et des niveaux de performance du secteur laitier. Les résultats concernant le « Revealed Comparative Advantage » montrent que les accords de libre-échange ne peuvent pas aider à créer des avantages comparatifs dans le secteur laitier.

Cette recherche pourrait être enrichie en considérant la qualité des produits et de la demande. Il serait aussi intéressant de voir si les résultats de cette étude peuvent être vérifiés pour d'autres secteurs agricoles et des types d'accords commerciaux autres que les accords de libre-échange.

Mots clés : libéralisation du commerce, accords de libre-échange multilatéral et bilatéral, performance, secteur agricole, secteur laitier, pays développés, pays en voie de développement.

SUMMARY

The subject matter of this research is of trade liberalization in the agricultural sector. Firstly, it aims at identifying the effects of free trade agreements on the performance of the dairy sector over a 20-year period from 1990 to 2009. Secondly, this research determines whether or not the effects differ between the types of free trade agreements; multilateral or bilateral. Finally, are the effects different for developed and developing countries?

A literature review reveals that the effects of free trade agreements on the performance of the agricultural sector vary between authors. Moreover, many of these researches focus on a specific country, a specific region or specific free trade agreements. This research however, covers many countries, including developed and developing countries, as well as all of their free trade agreements with provisions pertaining to agriculture. With this literature review, the notion of comparative advantage is used to define “performance” in the agricultural sector. As suggested by Latruffe (2010), several indicators of competitiveness, such as productivity, sectoral trade balance, farm-gate prices and the Revealed Comparative Advantage, are employed to capture the full effects of free trade agreements on performance.

An econometric panel study model captures the effects of free trade agreements on the indicators of performance of the dairy sector across a sample of 41 countries. The dependent variables are the indicators of performance. The independent variables are the multilateral and bilateral free trade agreements of the sample countries. Finally, the control variables are the countries’ factor endowments, their market size and growth, the level of mechanization in their agricultural sector, their governance structure, their domestic agricultural policies, their exchange rate and their corruption level.

Our results bring strong empirical evidence demonstrating that FTAs positively influence several indicators of performance, such as productivity and sectoral trade balance, if a country has a comparative advantage in the dairy sector. Furthermore, multilateral free trade agreements have a more positive effect on the performance of the dairy sector than bilateral agreements. The dairy sectors in developed countries benefit more from free trade agreements than developing countries do. Even though free trade agreements represent trade opportunities for dairy exporters, policymakers should select the types of free trade agreements and their country members very carefully.

No statistical relationships between free trade agreements and farm-gate prices as well as free trade agreements and the Revealed Comparative Advantage were found. This could be due to the fact that the model does not control for factors such as product quality and those related to demand. These factors could influence the difference between farm-gate prices and the level of performance in the dairy sector. Results concerning the Revealed Comparative Advantage indicate that free trade agreements do not help create comparative advantage in the dairy sector.

Future researches on the subject should consider the role of product quality and demand. It would also be interesting to verify if the results of this research can be duplicated for other agricultural sectors and other types of trade agreements, other than free trade agreements.

Keywords : trade liberalization, multilateral and bilateral free trade agreements, sector performance, agricultural sector, dairy sector, developed countries, developing countries.

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LISTE DES ABBRÉVIATIONS

AFTA: ASEAN Free Trade Agreement

ASEAN: Association of Southeast Asian Nations

COMESA: Common Market for Eastern and Southern Africa

CU : custom union

EIA : economic integration agreement

EU : European Union

FTA : free trade agreement

GATT : General Agreement on Tariffs and Trade

GDP : gross domestic product

HDI: Human Development Index

MERCOSUR: Southern Cone Common Market

MFN : most-favoured nation

OECD : Organisation for Economic Co-operation and Development

OLS : ordinary least square

PSA : partial scope agreement

PTA : preferential trade agreement

RCA : Revealed Comparative Advantage

RTA : regional trade agreement

URAA : Uruguay Round Agreement on Agriculture

USA: United States of America

WTO : World Trade Organization

AVANT-PROPOS

Ce mémoire est écrit dans le but d'en tirer un article qui sera publié dans une revue scientifique. Cet article intitulé « Trade Liberalization : The Effects of Free Trade Agreements on the Competitiveness of the Dairy Sector » a été soumis pour publication à la revue scientifique *The World Economy* le 30 avril 2012. Au moment du dépôt de ce mémoire cet article est toujours sous révision. L'article est cosigné par la directrice de recherche de ce mémoire, soit la professeure Ekaterina Turkina du HEC Montréal. Catherine Couillard a réalisé la revue de la littérature, l'élaboration du modèle théorique, l'identification des variables dépendantes, indépendantes et contrôlées du modèle empirique, la cueillette de données, l'analyse des résultats ainsi que la rédaction du texte.

Suite aux recommandations des membres du jury, des modifications ont été apportées à ce mémoire par l'étudiante. Ces modifications ont été faites par l'étudiante. Elles incluent :

- Une explication détaillée dans la section de la revue de la littérature du modèle théorique, basée sur la théorie de la libéralisation du commerce et de ces effets théoriques ;
- Une discussion élaborée de la libéralisation du commerce et de son impact sur le secteur laitier dans la revue de la littérature ;
- L'élimination de la section sur la compétitivité nationale et par conséquent, le changement du terme « sector competitiveness » pour « sector performance » ;
- Une explication plus détaillée des hypothèses sur les variables dépendantes des prix aux producteurs et du « Revealed Comparative Advantage » ;
- La modification des variables indépendantes pour n'inclure dans le modèle que les accords de libre-échange ayant rapport aux secteurs de l'agriculture ou aux produits agricoles ;

- Le retrait de la variable dépendante « part de marché » et par conséquence, l'annulation de l'hypothèse s'y rapportant puisque cette dimension fait partie du « Revealed Comparative Advantage » ;
- Une modification à la mesure de la variable dépendante productivité afin qu'elle représente la production en tonnes par hectare ;
- Effectuer des régressions séparées pour les pays développés et pour les pays en voie de développement ;
- Une explication plus détaillée du modèle empirique et des limitations de la méthodologie choisie ;
- Une discussion plus élaborée de l'interprétation des résultats pour les pays développés et pour les pays en voie de développement.

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1. INTRODUCTION

Liberalization of agricultural trade is a recent phenomenon (Meilke, 2000) and came later than was the case for industrial goods (Meilke and Huff, 2000). Although progress made by the WTO in liberalizing trade has slowed, preferential trade agreements (PTAs) have become more popular (Wei, 2011; Kavallari and Schmitz, 2008; Josling, 1998; Sarker and Jayasinghe, 2007; Piketty et al., 2009; Urata, 2009; OECD, 2010; Meilke, 2000). Even though these PTAs offer new market opportunities, especially in developing countries, trade liberalization is still a sensitive issue in the agricultural sector because of food security and food risk concerns (Zylbersztajn, 2010, Josling, 1998).

The literature on trade liberalization, PTAs and the agricultural sector focuses on particular countries or regions, and overall shows mixed results regarding the effects of trade liberalization or trade agreements on the agricultural sector. This research focuses on the most popular type of PTAs, free trade agreements (FTAs), and analyzes their effects on the agricultural industry, the dairy sector in particular, from a cross-national panel study perspective. Since the agricultural sector is highly dependent on a nation's factor endowments, the concept of comparative advantage is used in order to define performance in the dairy sector. As suggested by Latruffe (2010), we employ several indicators to capture the full effects of FTAs on performance. To our knowledge, there are no cross-country panel studies in the literature on the effects of existing FTAs on the performance of the dairy sector.

Our principal research questions are: what are the effects of trade liberalization, namely through FTAs, on the performance of the dairy sector across a series of developed and developing countries over a 20-year period (1990-2009)? Are the effects different for developed and developing countries? Do they differ between multilateral and bilateral FTAs?

Our results bring strong empirical evidence demonstrating that FTAs positively influence several indicators of performance, such as productivity and sectoral trade balance, if a country has a comparative advantage in the dairy sector. Moreover, gains appear to be greater for developed countries and multilateral FTAs. No statistically significant evidence is found for the relationship between FTAs and farm-gate prices and FTAs and Revealed Comparative Advantage (RCA).

This article is organized as follows: the first section is a literature review divided into six parts: 1) a description of the theory of trade liberalization; 2) a historical perspective of trade liberalization; 3) trade liberalization and the agricultural sector; 4) a description of the dairy sector; 5) empirical effects of trade liberalization in the dairy sector; and 6) the notion of performance in the dairy sector. The second section presents our model and analysis, and the third section presents a discussion on our findings. Finally, we conclude with possible avenues for future research on the subject.

2. LITERATURE REVIEW

2.1.Theory of Trade Liberalization

This section of the literature review explores the theory of trade liberalization. Firstly, we define the theory and consider the motivations behind pursuing trade liberalization. Secondly, we analyze the implications of removing trade barriers and opening markets for consumers, firms/sectors, producers, workers and nations.

2.1.1. Defining Trade Liberalization

Trade liberalization fosters structural reforms (Urata, 2009) as well as development and economic growth (Santos-Paulino, 2005; Bouët et al., 2007). These reforms are caused by an opening of markets through removal or reduction of trade barriers, such as tariff and non tariff barriers, in markets (Bacchetta and Jansen, 2003; Santos-Paulino, 2005). This opening of markets helps exporters secure access to foreign markets. Hence, trade liberalization presents opportunities in foreign markets for exporters (Urata, 2009; Sharma and Gulati, 2003; Santos-Paulino, 2005) and offers better market access to already established firms. As a result, competition increases in domestic markets through imports and on foreign markets through exports (Sharma and Gulati, 2003).

Santos-Paulino (2005, p.785) defines trade liberalization in a given country by whether its trade policies are “outward-oriented” or “inward-oriented”. For the author, an “outward-oriented” country is more liberal in its overall trade. In fact, this is the case if a country is neutral, liberal or open with their trade reforms. Neutral trade reforms requires “equalising incentives (on average) between the exporting and importing competing sectors” (Santos-Paulino, 2005, p. 785). While an “outward-oriented” country with a liberal approach would reduce the degree of intervention, openness means giving unrestricted access to its domestic market. Reasons for pursuing trade liberalization can be motivated by economic, political and/or social factors (Bacchetta and Jansen, 2003).

2.1.2. Theoretical Effects of Trade Liberalization

In theory, trade liberalization has an effect on the competitive environment in the domestic market (Bacchetta and Jansen, 2003). By promoting competition in domestic markets and by opening them, low cost imports become available at

cheaper prices in the marketplace. Indeed, “there will always be industries in which foreign competitors are more efficient than domestic producers” (Bacchetta and Jansen, 2003, p.15). Consequently, trade flows between countries should increase because resources will be reallocated to the most efficient industries.

In fact, trade liberalization is often tied to the notion of comparative advantage in sectors dependent on natural resources like agriculture. The term comparative advantage is “defined for the most part in relation to resource endowments, both natural, including climate, and man-made, which includes both human and physical capital” (Schuh, 1988, p. 590). Latruffe (2010, p. 7) defines the theory of comparative advantage as “the result of differences in production costs among countries and that a country will specialise in the production of a good in which it has a cost advantage.” Therefore, abundant resources and capital should be concentrated in industries and firms which are relatively the most productive. Moreover, it is more beneficial to import goods produced at a cheaper cost or at better quality than the same good produced locally at a higher cost (Boossabong and Forest, 2009). In other words, production patterns in nations will become specialized where they have a comparative advantage to benefit from the full effects of trade liberalization.

Although comparative advantage can be useful in explaining some effects of trade liberalization, especially in sectors dependent on natural resources, the notion has certain limits. Firstly, the world is not static as assumed by the theory (Yeager and Tuerck, 1984). Indeed, domestic factors other than resource endowments have an effect on a nation’s comparative advantage. Such factors can include exchange rates, investments and foreign investments. Secondly, comparative advantages can be created and controlled by a nation, its institutions and the adaptability of its workers (Yeager and Tuerck, 1984; Cho and Moon, 2000; p. 186). Hence, it is important to consider the role a government can play to influence a nation’s comparative advantage. Thirdly, the theory does not account for concerns about food security (Boossabong and Forest, 2009). For example, according to the authors, access to

certain imported food products can be restricted for a population, yet these products can be substituted for other local food products. Following the logic behind comparative advantage, if a nation does not have a comparative advantage in agriculture or processed foods, it should import these items at a lower cost. Yet, it may not be in a nation's best interest to simply rely on food imports even if the nation does not hold a comparative advantage in agriculture or processed foods.

Overall, the theory of trade liberalization increases efficiency by reallocating resources according to comparative advantages. Liberalizing trade also raises living standards in nations, reduces costs and increases product quality and diversity (Yeager and Tuerck, 1984; Westhoff et al., 2004). Indeed, living standards improve with new opportunities for exporting firms and from the reallocation of resources to the most efficient sectors. Also, these gains in efficiency reduce costs and allows for economies of scales. Increase competition due to trade liberalization means different products are available on the market ranging in quality.

In a trade liberalization context, some will benefit from the removal of barriers to trade while others will lose. In general, the gains and losses are distributed amongst consumers, firms/sectors, producers and workers. Firstly, it is generally believed that consumers benefit from trade liberalization because products become available at lower prices (Bacchetta and Jansen, 2003). Increased competition on the domestic market can also result in increased quality and variety of goods available on the domestic market (Bacchetta and Jansen, 2003).

Secondly, the effects on sectors and firms are mixed. For example, sectors and/or firms can respond by increasing their competitiveness by becoming more efficient and productive (Bacchetta and Jansen, 2003; Santos-Paulino, 2005). They can also benefit from exploiting economies of scale when production factors are in line with comparative advantages (Bacchetta and Jansen, 2003; Santos-Paulino, 2005). Also,

when firms are in foreign markets, they can benefit and learn from being exposed to higher quality products available on that market and gain from spillover effects (i.e. having access to new technologies) and knowledge transfer (Bacchetta and Jansen, 2003; Santos-Paulino, 2005).

Yet, for some firms and/or sectors, they may not be able to remain competitive because trade liberalization can entail adjustment or start-up costs that they cannot bear (Bacchetta and Jansen, 2003). These authors note that these costs are particularly detrimental for small firms and those in developing countries. Moreover, some firms may experience lower returns on capital. When a firm cannot maintain or increase its competitiveness, it can have negative repercussions on employees (Bacchetta and Jansen, 2003). Indeed, these firms may need to lower wages or cut jobs. Workers may need to relocate or find jobs in their countries' exporting industries in turn costing them time and financial capital.

Thirdly, some nations' economies would benefit from increased trade. It is argued that trade liberalization would increase income levels, particularly in most developing countries (Bacchetta and Jansen, 2003). The authors also believe that some developing countries may not be able to seize the growth opportunities brought by the removal of trade barriers.

Those who oppose trade liberalization are generally those who would perceive losses from removing those barriers to trade (Davidson and Matusz, 2006). In reality, "adjustment costs that are very small for the economy as a whole can be very large for particular groups, giving those groups a strong incentive to organize, lobby and otherwise apply political pressure to maintain protection" (Bacchetta and Jansen, 2003, p.19). Taken as a whole, overall gains for consumers, firms/sectors and nations in the medium to long term are usually more important than the losses and costs

sustained when trade is liberalized (Davidson and Matusz, 2006; Bacchetta and Jansen, 2003).

While Santos-Paulino (2005) claims that evidence of trade liberalization leading to economic growth are mixed, Bacchetta and Jansen (2003) argue that the phenomenon does not affect production patterns. However, according to the theory of trade liberalization and growth, it would seem that current domestic policies on trade benefit producers to the expense of consumers (Zhu et al., 1999). Yet, in a scenario where trade is liberalized, it could be the opposite. This scenario could also be more advantageous for larger producers because these producers can take advantage of cost efficiencies, economies of scales and bargaining power.

The next section presents a global historical perspective of trade liberalization. It places particular emphasis on the evolution of the World Trade Organization (WTO) as a multilateral trading system and the development of free trade agreements (FTAs) within the WTO context. Finally, the current global trade landscape is discussed.

2.2.Trade Liberalization: Historical Perspective

In the 1930s, trade tariffs around the world were very high, but started to decline significantly in the 1960s (Baldwin, 2006). The author claims that in 1963, there were two major trading hubs: North America and Western Europe. These two hubs traded, namely through trade agreements, with a few other countries or spokes. Yet, over the years the dynamics between the WTO and different countries has led to a proliferation of trade agreements, changing the global landscape of trade and trade liberalization.

2.2.1. World Trade Organization (WTO)

Following World War II, a major global trade liberalization effort first began with the establishment of the General Agreement on Tariffs and Trade (GATT) in 1947. Before the GATT became the World Trade Organization (WTO) in 1995, it had 128 member countries.¹ In 2012, the WTO boasts 153 members, of which 117 are developing countries or separate customs territories.² The WTO, a multilateral trading system, strives to liberalize global trade by eliminating tariff and non-tariff barriers. Yet, “the binding commitments provide for the stability and predictability of multilateral negotiated liberalization but they also impose certain constraints on governments’ trade and trade related policies” (Bacchetta and Jansen, 2003, p.43). It is important to note that at the heart of the WTO is the principle of non-discriminatory trade extended to all members through the most-favoured-nation (MFN) principle (Wei, 2011).

In general, the GATT and the WTO are regarded as important steps towards liberalized trade (Santos-Paulino, 2005). Yet, “for non-members, the WTO appears as the largest and most restrictive PTA [plurilateral trade agreement] in the world” (Menon, 2007, p.37).

2.2.2. Free Trade Agreements (FTAs)

Since the early 1990s, however, preferential trade agreements (PTAs) have proliferated with a substantial shift from multilateralism to regionalism (Wei, 2011; Hayakawa and Yamashita, 2011). Indeed, regional trade agreements (RTAs) are an “alternative channel to multilateral trade” (Jalles, 2012, p.64). Hayakawa and Yamashita (2011) note an increase in PTA trading partners for each country. “Nearly all WTO members are party to one or more RTAs [regional trade agreements or

¹ WTO, http://www.wto.org/english/thewto_e/gattmem_e.htm

² WTO, http://www.wto.org/english/thewto_e/whatis_e/tif_e/org6_e.htm

PTAs]” (Wei, 2011, p.1). Moreover, the number of PTAs between developed and developing countries is increasing (Wei, 2011). Yet, the number of RTAs between developing countries is relatively small (Lloyd and Maclaren, 2004). This recent trend towards PTAs is due in part to the WTO’s slow progress in negotiations (Wei, 2011) and its perceived loss of credibility as a multilateral trade system (Baldwin, 2006). Indeed, some believe that the WTO could have played a bigger role in regulating RTAs and their proliferation instead of acting as a by-stander (Baldwin, 2006).

“Preferential trade agreements comprise a variety of unilateral, bilateral, or regional arrangements which favour member parties over non-members by extending tariff and other non-tariff preferences” (Ahearn, 2011, p.1). There are several different types of PTAs such as customs unions (CUs), economic integration agreements (EIAs), partial scope agreements (PSAs) and free trade agreements (FTAs). The FTA is the most common type of PTAs around the world today (Ahearn, 2011; Menon, 2007), which “eliminates tariffs, quotas, and preferences on most traded goods”, while maintains tariffs, quotas, and other non-tariff barriers vis-à-vis non-members (Ahearn, 2011, p.1). Since FTAs apply preferential duties to member countries, there is an ongoing debate whether or not PTAs are undermining the WTO and its MFN clause (Menon, 2007). Regardless, WTO members are allowed to belong to FTAs and CUs (Ghazalian and Cardwell, 2010; Wei, 2011), as long as those agreements promote freer trade and do not create additional trade barriers for non-member countries of the PTAs (Korinek and Melatos, 2009; Urata, 2009; Meilke and Huff, 2000; Lloyd and Maclaren, 2004).

In addition to offering new market opportunities (Ahearn, 2011), PTAs give a rapid alternative to liberalizing trade since fewer parties are involved than in the WTO or in multilateral trade (Urata, 2009; Lloyd and Maclaren, 2004; Menon, 2007; Baldwin, 2006). However, the effects of RTAs on multilateral liberalization depend on the motivation behind their creation (Lloyd and Maclaren, 2004; Menon, 2007). While

these motivations can be economical and/or political, the authors claim that the objectives of RTAs should be to enhance global welfare. On the other hand, Baldwin (2006, p.1499) claims that “the politically optimal structure of a given bilateral FTA depends upon the comparative advantages of the two nations and the particular political strengths of various interest groups at the time the deal is signed”.

Over the years, researchers have identified specific economic and political factors behind the creation of RTAs and the recent increase in their number. The following are factors favouring the participation or creation of these agreements:

- As mentioned above, as nations became dissatisfied with the progress made by the WTO in regards to trade liberalization, RTAs became a quicker and easier option to multilateral trade liberalization (Urata, 2009; Lloyd and Maclaren, 2004; Menon, 2007; Baldwin, 2006);
- The “domino effect” encourages countries to seek participation in RTAs because they might “suffer from discrimination if the nation stays out” of an RTA (Baldwin, 2006, p. 1467). In other words, countries feel forced to enter RTAs to avoid discrimination of their exports when RTAs are signed between their export markets and other countries (Lloyd and Maclaren, 2004). Countries might perceive that they would benefit more from being a member of an agreement than not being a member of it, so that sometimes, agreements which might have been unattractive for a country become a viable solution (Baldwin, 2006; Lloyd and Maclaren, 2004; Menon, 2007);
- As mentioned above, it is possible to gain market access through RTAs. These agreements become a useful tool for countries to gain access to bigger nations’ more important markets (Baldwin, 2006);
- Membership to RTAs can be motivated by sector incentives (Menon, 2007; Baldwin, 2006). RTAs can be alluring because members can opt to exclude special or sensitive sectors like agriculture or include sectors which are not liberalized at the multilateral level;

- Participation to an RTA can be lobby driven (Baldwin, 2006) as is the case with “fair trade” demands and labour standards (Menon, 2007). The author refers to these RTAs as strategically motivated RTAs;
- The occurrence of some events, like aspiring to become a member to the WTO, can encourage nations to seek RTA participation (Menon, 2007). Other event driven RTAs include political integration such as EU states and political disintegration such as RTAs between countries from the former Soviet Union (Menon, 2007, p.36-37);
- By providing predictable and binding trading rules (Ghazalian and Cardwell, 2010), RTAs can alleviate resistance to policy reforms and give more credibility to governments as their trading systems become more stable (Bacchetta and Jansen, 2003);
- Other factors are described by Ahearn (2011) when discussing the reasons for EU entering RTAs. These reasons include close proximity, historical and development focus for poorer countries, fostering stability and neutralizing potential discrimination against its own exports and investments.

2.2.3. Global Trade Landscape Today

Since the early 1990s, RTAs are becoming more and more inter-related (Lloyd and Maclaren, 2004). Recent years saw the emergence of a new hub, East Asia, and, the emergence of multiple spokes due to the proliferation of RTAs. These new networks are creating an inter-related network where boundaries between trading blocs become blurry. Baldwin (2006) refers to this phenomenon as “fuzzy, leaky trade blocs”. This pattern of hubs and spokes create discrimination because hubs (mostly developed countries) have access to more markets than the spokes (mostly developing countries) (Lloyd and Maclaren, 2004). In return, the spokes are usually more dependent on the hubs than the hubs are dependent on the spokes (Baldwin, 2006). In addition, the global market is becoming more integrated as barriers to trade are removed gradually in developing countries (Jalles, 2012). Yet, it is argued that because of the WTO and

RTAs, trade in developed countries has been liberalized more than in developing countries (Baldwin, 2006).

Thus, today's international trade landscape is characterized by a "spaghetti bowl effect," where there is "a widespread of overlapping trade agreements..." resulting in additional international business transaction costs (Hayakawa and Yamashita, 2011, citing Sally, 2008). This phenomenon fragments the world (Menon, 2007) and becomes particularly complex when rules of origin and bilateral cumulation (the supply of intermediate products) are concerned (Baldwin, 2006).

Overall, RTAs differ amongst themselves in regard to the nature of the agreement, coverage and scope. Also, the additional costs created by the multitude of RTAs in the world today may represent significant barriers for some exporters and developing countries. Jalles (2012) found that trade liberalization through RTAs had mixed results on domestic economic growth. It is not surprising then that Menon (2007) claims it is highly unlikely that these agreements can replace multilateral deals when it comes to fully liberalize trade. In fact, Baldwin (2006) believes that in order to harmonise world trade and achieve full trade liberalization, there will need to be an eventual multilateralization of all RTAs.

It is important to note that trade liberalization in agriculture has been slower than in other sectors, mainly due to domestic policies, the sector's distinctive characteristics and impasses in the WTO's trade negotiations. Now that the theory of trade liberalization and its implications have been discussed, the next section considers the evolution of trade liberalization in the agricultural sector and more specifically in the dairy sector.

2.3.The Agricultural Sector and Trade Liberalization

There are significant differences in market dynamics and in structural economics between the agricultural and the non-agricultural sectors (Headey, 2008; Koester, 1985). Liberalization of agricultural trade is a recent phenomenon (Meilke, 2000) and came later than was the case for industrial goods (Meilke and Huff, 2000). Moreover, “agriculture has lagged behind other major sectors in achieving economic gains from trade liberalization” (Roberts et al., 1999, p.13). Reardon and Barrett (2000) argue that increased trade is due to trade liberalization through FTAs and domestic policies. In fact, the global agricultural sector and its trade policies are constantly being shaped by the national domestic environment and the global market (Zylbersztajn, 2010; De Benedictis et al., 1991; Parikh et al., 1989; Losch, 2004). For example, emerging countries like China, Brazil and India bring new dynamics to global food demand and raise concerns such as food security, food quality, income growth, new market requirements (Zylbersztajn, 2010, Josling, 1998) and employment (Alexandratos et al., 1994). As mentioned in section 2.1.1., trade liberalization offers new opportunities to exporters and promotes structural reforms (Urata, 2009) and economic growth (Zamroni, 2006; Meilke, 2000).

2.3.1. Domestic and Trade Policies in the Agricultural Sector

Indeed, the agricultural sector is particularly sensitive to national policies (Bouamra-Mechemache et al., 2002), even more so than other sectors (Koester, 1985). Since agriculture touches many sensitive issues such as food safety and national security (Zylbersztajn, 2010; Belhaj Hassine and Kandil, 2009; Reardon and Barrett, 2000; Blandford, 1999; WTO, 2003; OECD, 2010), many countries, especially the developed countries, still favour a protectionist approach to their agricultural policies (Koester, 1985; Sharma, 2005; Rude and Meilke, 2002). In fact, Zhu et al. (1999) claim that trade liberalization in the agricultural sector has been more difficult to achieve because of the restrictive government policies still in use. To this day, the

dairy sector remains one of the most protected sectors in developed countries (Suzuki and Kaiser, 2005; Meilke et al., 2001) and in agriculture (OECD, 2004; OECD, 2005; Zhu et al., 1999; Langley et al., 2006). While most domestic measures in place try to protect dairy farmers (Suzuki and Kaiser, 2005), these measures vary in composition and by country (Gouin, 2004; OECD, 2004; OECD, 2005). In fact, Gouin (2004, p.2) claims that “government intervention in agriculture in the developed countries has historically been based on the fact that it is a special economic sector that cannot be regulated by the rules of free market alone.”

The level of protection and the composition of measures used can have serious repercussions on production patterns (OECD, 2004), producer welfare (OECD, 2005) and global trade flows (Herndon, 2005) as well as on developing countries (Roberts et al., 1999). Because of these perceived potential losses from trade liberalization in the dairy sector, dairy interest groups in developed countries, composed of farmers and their cooperatives, industries/sectors and other interest groups, have strong political influence over domestic policies (Herndon, 2005).

The level of protection afforded to the dairy sector in developed countries is creating international tension (Zylbersztajn, 2010; Reardon and Barrett, 2000; Alexandratos et al., 1994; Picado González, 2008; Zamroni, 2006; Head and Ries, 2004; Sharma, 2005; Lorde et al., 2010). While developed countries use all sorts of barriers to remain competitive on the global agricultural market, many developing countries have adopted domestic policies that are detrimental to their agricultural markets (Restuccia et al., 2004). In fact, several still use measures, such as high tariffs, to restrict imports in their domestic markets (Bouët et al., 2007).

2.3.2. The WTO and Agriculture

It is only during the Uruguay Round negotiations from 1986 to 1995 that agriculture became a topic of focus in the WTO's agenda. The Uruguay Round Agreement on Agriculture (URAA), the first multilateral trade agreement to include the agricultural sector (International Policy Council on Agriculture, Food and Trade, 1996), aimed at eliminating and/or reducing all agricultural trade distorting measures and programs covering three main categories: market access, domestic support and export subsidies (WTO, 2003). Yet, the URAA resulted in only partial liberalization of the agricultural sector (Bouamra-Mechemache et al., 2002; Sharma and Gulati, 2003; Cox et al., 1999; Langley et al., 2006). Though lower than the pre-URAA era, market distortions and trade barriers are still present on the agricultural sector (Gifford and Dymond, 2008; OECD, 2004; OECD, 2005; Bouamra-Mechemache et al., 2002; Zhu et al., 1999). In fact, the dairy sector was not affected significantly by the changes in the agreement (International Policy Council on Agriculture, Food and Trade, 1996; Sharma and Gulati, 2003).

In late 2001, the WTO launched the Doha Round which aimed at further liberalizing global trade. It is important to note that this round of negotiations was designed to further integrate developing countries in the process (Bouët et al., 2007). By showing a united front at the negotiations, these countries gained considerable bargaining power against developed countries (Bouët et al., 2005). Namely, developing countries lobbied against distorting farm policies and other distortive market measures currently in place in developed countries (Bouët et al., 2005). Nonetheless, several countries such as the EU, USA and Japan still managed to restrict agricultural trade (Baldwin, 2006).

While negotiations resulted in frameworks to reduce dairy supports (reductions being greater for countries and commodities with higher protection) and elimination of all forms of export subsidies, the timetable for this elimination has yet to be determined

(Suzuki and Kaiser, 2005). In addition, the Doha Round's Agreement on Agriculture grants developing countries more flexibility in regards to trade liberalization for market access, domestic support and export competition (Bacchetta and Jansen, 2003). Also, the "sensitive products" clause included in the agreement leaves room for country members to maintain high tariffs on goods (Suzuki and Kaiser, 2005) under food security, rural development or livelihood concerns (Westhoff et al., 2004). Moreover, special safeguard provisions were designed to help producers adjust to market changes when imports negatively affect a sector (Bacchetta and Jansen, 2003) by restricting imports in the domestic market (Sharma and Gulati, 2003). But unlike the special safeguard measures in other sectors, the special safeguard concerning agriculture can be evoked by one party without any proof of injury (Bacchetta and Jansen, 2003).

Overall, the Doha Round failed to bring freer trade forward, creating more issues by allowing developed countries to maintain their high level of subsidies, implement more protection measures to support their domestic agricultural sectors, gain more access to developing countries' markets (Sharma, 2005; Lorde et al., 2010; Ball et al., 2010) and to exempt certain products or sectors from liberalization (Bacchetta and Jansen, 2003). As a result, many countries are unsatisfied with the recent WTO agricultural negotiations and now turn to PTAs to gain further access to agricultural markets.

Thus, even though there have been several attempts by the WTO to liberalize international agricultural trade, domestic and trade policies still distort agricultural markets (OECD, 2010). Therefore, FTAs are the main source of trade liberalization in the agricultural sector. Yet, even though it may seem like the proliferation of FTAs make the WTO ineffective in its quest for trade liberalization, it is important to note that several developing countries and smaller countries rely on the WTO for trade liberalization (Menon, 2007). As the author points out, many of these countries do not possess enough resources to negotiate and join FTAs or deal with additional costs

relating to rules of origin associated with trade agreements. Moreover, the WTO acts as a platform for the liberalization of sectors and products otherwise excluded, such as was the case for the agricultural sector, and set precedents for future negotiations (Menon, 2007).

Our research focuses on the dairy sector because not only is this sector very sensitive to national and international policies, but the level of trade liberalization, despite the WTO's efforts, is different from one country to another. The next section describes production, trade and consumption patterns as well as domestic policies specific to the global dairy sector.

2.4.The Global Dairy Sector

2.4.1. Production, Pricing, Trade and Consumption

The dairy market is in its mature phase in most developed countries (Gifford and Dymond, 2008; OECD-FAO, 2011) whereas demand is growing in many developing countries (Roberts et al., 1999, OECD-FAO, 2011). In developed countries, many domestic policies, such as export subsidies, direct payments, guaranteed price policies and border measures, encourage dairy producers to overproduce (International Policy Council on Agriculture, Food and Trade, 1996; Sharma and Gulati, 2003). These surpluses are then sold on the international market (Suzuki and Kaiser, 2005; Gifford and Dymond, 2008; Sharma and Gulati, 2003). Typically, in the dairy sector, “low value products are exported to developing countries and high value products are traded largely among developed countries” (Sharma and Gulati, 2003, p.11).

A majority of the milk is consumed in its fluid form and in the region it was produced (Gifford and Dymond, 2008; Meilke et al., 2001; OECD, 2004; OECD, 2005), mainly because of transportation costs (OECD, 2005) and international dairy policies (Meilke et al., 2001). So, it is not surprising that the top producing countries of milk are not necessarily the top exporters of dairy products (Herndon, 2005). Table 1 presents the biggest exporters for 2009.

Table 1: 2009 Top Dairy Exporters (aggregated milk and dairy products)

Top Dairy Exporters	Dairy Exports	Market Share
1. Germany	\$7 537 978 000	14.56%
2. France	\$6 195 681 000	11.96%
3. Netherlands	\$5 413 866 000	10.45%
4. New Zealand	\$5 084 337 000	9.82%

Source: data are from the FAO website.

While milk production can be restricted due to seasonality, the main milk source differs between countries. For example, in many developing countries milk comes from sheep, goats and camels. These animals typically have lower yield levels than cows. This can explain for the differences in the level of milk production between developed and developing countries (OECD-FAO, 2011).

Usually, “the rich countries generally have a comparative advantage in goods and services whose production is skill intensive, which means they import goods and services whose production uses unskilled and low skill labour” (Bacchetta and Jansen, 2003, p. 23). Indeed, developing countries often hold a comparative advantage in agriculture (Bouët et al., 2005; Bacchetta and Jansen, 2003). In fact, many households rely on agriculture in many of these countries (Bouët et al., 2007). For example, “India is the largest milk producer in the world and milk production is

based on smallholder system with one or two milch animals” (Sharma and Gulati, 2003, p.3).

Producers in OECD countries receive higher prices for milk and dairy products than those in non-OECD countries because of domestic support policies in OECD countries (OECD, 2005; OECD-FAO, 2011). In other words, “in many developed countries, domestic prices are supported at levels significantly above the world price” (Sharma and Gulati, 2003, p.14).

2.4.2. Domestic and Trade Policies in the Dairy Sector

Protection measures used in the dairy sector are highly distortive for the global dairy market (OECD, 2004; Bouamra-Mechemache et al., 2002; Herndon, 2005; Sharma and Gulati, 2003) shifting the market away from a competitive equilibrium (Zhu et al., 1999). Policies used in the dairy sector are tariff quotas, quota production, import quotas, import tariffs, price support programs, export subsidies and other non-tariff barriers such as sanitary and labeling regulations. While import policies usually restrict imports, export policies can restrict or promote exports (Zhu et al., 1999). Moreover, export policies affect world prices causing them to be more volatile (Zhu et al., 1999). In fact, most of these distortive measures are found in developed countries, particularly the EU, USA, Japan and Canada (Sharma and Gulati, 2003). Zhu et al. (1999, p.189) add that “many countries (e.g., Canada and the EU) have direct production control policies in their dairy sector as a means of dealing with the market imbalance caused by price support”. Also, special safeguard provisions at the WTO are often used for dairy products, especially by the EU and USA (Sharma and Gulati, 2003).

According to Suzuki and Kaiser (2005, p. 1902-1903), most developed countries protect their dairy sector for the following reasons:

- *Milk is a basic food:* Since milk is considered a basic food, it is important for nations to remain self-sufficient and independent from foreign suppliers;
- *Unique characteristics of milk:* transportation of fluid milk can be tricky since it is perishable and can be subject to bacterial contamination (OECD, 2005). Moreover, the seasonality of fluid milk production means there exists “a seasonal imbalance between milk demand and supply” (Kaiser and Suzuki, 2005, p. 1902);
- *Oligopsonic nature of milk nature:* the dairy sector is characterized by a few number of buyers and sellers (Kaiser and Suzuki, 2005; Sharma and Gulati, 2003);
- *Large differences in international competitiveness amongst countries;*
- *Strong political influence of dairy interests groups on domestic markets.*

Since trade liberalization and subsequent policy reforms may affect a nation’s trading patterns and traded commodities (Wu and Thomson, 2003), some believe that open free markets may have harmful outcomes for many national agricultural sectors (Belhaj Hassine and Kandil, 2009; Costa Gurgel, 2007; Francois, 2007) and/or producers (Zamroni, 2006). In fact, domestic policies and agricultural trade agreements affect the performance of the dairy sector (Kennedy and Parr Rosson, 2002; Wu and Thomson, 2003).

The following section summarizes the empirical effects of trade liberalization in the global dairy sector and in several developed and developing countries. It is important to understand how multiple trade liberalization scenarios impact trade liberalization in order to determine the influence FTAs can have on the dairy sector.

2.5.Effects of Trade Liberalization in the Dairy Sector

Research on the impact of trade liberalization in the dairy sector varies according to research objectives, methodology, data used and variables included. Some methods simulate partial and full trade liberalization scenarios while others are static ex-post analysis of trade liberalization via enforced agreements or implemented policy reforms. Moreover, some consider the impact of trade agreements, agriculture agreements in the WTO or the removal of a mixture of domestic and trade policies over a certain time period. Similarly, results differ amongst and within groups studied, such as producers, consumers and taxpayers, and other variables such as dairy prices, production and trade patterns. The answer to whether or not there is a positive relationship between trade liberalization and the performance of the dairy sector remains ambiguous.

In a study simulating the 1995 URAA dairy commitment from its implementation to 2005, Cox et al. (1999) found that protection measures are still present in western countries and that in general, most dairy producers lose. However, regions producing dairy products at low costs such as New Zealand, Australia and South America benefit from the agreement while producers in Japan, Canada and the USA suffer but small losses. The authors contrasted the URAA scenario to a scenario where trade is fully liberalized finding that the impact of URAA scenario is about half of the latter.

In a similar study, Zhu et al. (1999) used a simulation to analyze the impact of trade liberalization on world dairy prices, production, consumption and trade flows. The simulation included two scenarios similar to the previous study; one with changes made by the URAA, but for the year 2000 and, the other, a full trade liberalization scenario.³ In the URAA scenario, trade volumes decrease in general, but positive and negative effects vary amongst dairy commodities. World dairy prices increase and

³ In this study, a full trade liberalization scenario meant the removal of all tariffs, import quotas, export subsidies and domestic farm policies.

production becomes more efficient. While the URAA has a negative effect on Western Europe and Canada, it has a positive effect on Eastern Europe, New Zealand and South America. Only Japan and the USA see a small, but negative impact. In the full trade liberalization scenario, results are similar to the ones obtained in the URAA simulation, but become more significant. In the end, milk producers are negatively affected by both scenarios, while consumers benefit from these scenarios. The authors also add that results are consistent with the countries' comparative advantage as stated by the theory of trade liberalization. Thus, when results for both scenarios are compared together, it is possible to conclude that the URAA is a "small step towards dairy trade liberalization: they generate only a fraction of the welfare changes that could potentially be obtained under total free trade" (Zhu et al., 1999, p.198).

In a different study, Meilke et al. (1998) analyzed the case of bilateral trade liberalization of the dairy sector between Canada and the USA with a partial equilibrium model. They found that the liberalization of the sector inversely affects Canadian producers, but benefits new entrants. The bilateral liberalization of trade has an effect on raw milk prices which in turn affects all dairy product prices. They conclude, however, that this scenario would not encourage trade flows between both countries. On the contrary, it would result in little trade if any at all.

In their paper on the agricultural sector in developing countries and the WTO's Doha Round, Bouët et al. (2005) argue that research using Applied General Equilibrium models have overestimated the benefits of trade liberalization in developing countries. These differences are in part due to methodological issues such as variables included and how they were measured. In fact, the authors found that the Doha agreement on agriculture simulated scenario does not benefit most developing countries as well as farms in the EU. The more developed countries in Asia and the USA are not affected significantly by the agreement. Finally, developed countries

which remove most of their distorting policies benefit the most and some increase their productivity and export volume.

In another study on trade liberalization using a general equilibrium model and perimeters from the Doha Round, Bouët et al. (2007) found that price increase for agricultural goods is greater for products such as raw milk and other dairy products. This increase in price undoubtedly affects the performance of the dairy sector. They argue that gains in trade and welfare from the Doha agreement simulated scenario are small. While developing countries with a comparative advantage in agriculture gain, other countries in the sub-Saharan region and Mediterranean countries lose from trade liberalization in such a scenario.

Langley et al. (2006) simulated the effects of trade liberalization on dairy production, consumption, prices and trade. The study removes domestic and trade policies in the dairy sector with five different scenarios. The first three scenarios demonstrate the effects of the removal of individual domestic and trade policies, while the last two scenarios remove some of those policies simultaneously. The authors found that the removal of the domestic and trade policies included in the study would affect countries differently. In short, low cost countries like New Zealand and Australia gain the most, price and trade wise. Countries with highly protected dairy sectors lose. Overall, the study shows that trade liberalization in the dairy sector increase global dairy prices. The price increase makes production and trade fall. Market shares shift with changes differing between dairy commodities and countries. The study uses a partial equilibrium model.

Cox and Zhu (2005) studied the impact of trade liberalization on economical and welfare indicators. The model eliminates domestic and trade policies in two different scenarios between 2001 and 2005. The first scenario simulates a free trade scenario where all trade distortion is removed. The second represents a scenario where only

domestic support is eliminated. In the first scenario, consumers gain from decreasing prices. Also, producers in the Oceania region and in developing countries benefit from this scenario while consumers slightly lose. With the elimination of all distortions, developing countries gain from having access to larger markets. They increase production and prices rise. In general, world production increases by 1.1 percent while global prices decline by 7.8 percent, with a significant drop of 20.7 percent in developed countries and a slight increase of 2.7 percent in developing countries. The authors argue that losses in this scenario are offset by the gains. In the second scenario, overall welfare is negatively affected by the changes because other distortive measures continue to act as trade barriers. Producers in developed countries like Canada and the EU lose as prices decline as well as exports. Once again, countries in the Oceania region and in dairy export oriented developing countries gain the most as they still manage to gain market access to high priced markets. Consumers in these countries lose slightly, but these losses are smaller than producer gains.

In their research using a general equilibrium model, Bouamra-Mechemache et al. (2002) studied the effects of partial market liberalization in the EU's dairy sector on prices, production, consumption, trade, producer welfare as well as consumers and taxpayers' welfares. The model used resource allocation patterns and multiple commodities and agents. The four scenarios simulated the removal of production quotas with and without the elimination of domestic and trade policies. The model also assumed that changes for the year 2000 at the GATT level were all implemented. The authors found that elimination of production quotas in the dairy sector in the EU is more beneficial when subsidies are removed as well. Therefore, partial trade liberalization is not always the best option. In general, under all four scenarios, the elimination of production quotas increases milk production and decreases milk prices by over 24 percent. Basic commodities such as butter, skim milk powder and whole milk powder are affected most by the trade reforms. High-value added products like cheese see their prices fall and production increases. As for the welfare effects, producer surpluses diminish while consumer and taxpayer welfare increases.

Interestingly, producer losses are more important than consumer gains, except in the scenarios where export subsidies are removed in combination with production quotas.

In a report, the OECD (2004) used two different models to assess changes in dairy production, dairy consumption, trade, dairy prices, income and welfare after the reduction or elimination of milk quota systems. The first model, a partial equilibrium, Aglink, studied these impacts according to different commodities and OECD countries and non OECD countries. Under this study, increase in prices is more significant for butter. Dairy prices and production decrease in the EU, Canada, Japan and Mexico. Consumption of dairy products in these countries increases because prices decline. For countries without market price support policies, like New Zealand, Australia, Brazil and Argentina, there is a small increase in dairy prices and production. Consequently, consumption in these countries diminishes and exports increase. Smaller countries would gain the most from multilateral trade liberalization. The second model, PEM, is a partial equilibrium static model including five commodities and six countries; EU, USA, Mexico, Canada, Switzerland and Japan. In this scenario, Japan gains considerably more than other countries in the analysis. Countries with highly supported dairy sectors like Switzerland, Canada and Mexico experience a decline in dairy prices. The world dairy prices increase by 46 percent in a multilateral trade liberalization scenario where taxpayers and consumers gain the most. Overall, these two different analyses show that with both models world dairy prices increase and production tends to realign with comparative advantages. Moreover, they conclude that multilateral trade liberalization yields greater overall benefits than unilateral liberalization and that the greater are the gains when more countries are involved in trade liberalization.

Taken as a whole, research on the impact of trade liberalization on the dairy sector shows different results for different economical and welfare parameters. Table 2 presents a summary of the above mentioned researches on trade liberalization and the dairy sector. While it is generally agreed that world dairy prices would increase and

producers would sustain losses, results on production and trade patterns differ. The effects are mixed for developed countries, countries with highly protected dairy sectors and for developing countries. However, researchers seem to agree that consumer and taxpayer welfare would benefit from liberalized trade. Also, countries with a comparative advantage in the dairy sector, developed or developing, would gain from trade liberalization.

Table 2: Summary of Studies on Trade Liberalization in the Dairy Sector

Authors	Research Objective	Model	Findings
Cox et al. (1999)	Compare the effects of policy reforms in the URAA with that of a full trade liberalization scenario.	Simulation of the 1995 URAA dairy commitment from its implementation to 2005	In the URAA scenario: <ul style="list-style-type: none"> - Dairy producers (-); - Low cost regions like New Zealand, Australia and South America (+); - Producers in Japan, the USA and Canada (-), but small. Results in this scenario are only half of those in the full trade liberalization scenario.
Zhu et al. (1999)	Analyze the impact of trade liberalization on world dairy prices, production, consumption and trade flows.	Simulation of two different trade liberalization scenarios; 1) policy reforms from the URAA 2000; 2) full trade liberalization	In the URAA scenario: <ul style="list-style-type: none"> - Western Europe and Canada (-); - Japan and USA (-), but small; - Eastern Europe, New Zealand and South America (+); - World dairy prices (↑); - Trade (-); - Producers (-); - Consumers (+); - Production is more efficient. Results for the full trade liberalization scenarios are similar but more significant.
Meilke et al. (1998)	Analyze the case of bilateral trade liberalization of the dairy sector between Canada and the USA.	Partial equilibrium model	<ul style="list-style-type: none"> - Canadian producers (-); - Trade would not change significantly.
Bouët et al. (2005)	Research the effects of policy reforms from the Doha Round on the agricultural sector.	Applied general equilibrium	<ul style="list-style-type: none"> - Developing countries (-); - EU farmers (-); - Developed countries which would liberalize trade the most (+); - USA and developed Asia no changes.
Bouët et al. (2007)	Determine the impact of the Doha Round on the agricultural sector.	General equilibrium	<ul style="list-style-type: none"> - Dairy prices (↑); - Trade and welfare (+), but small; - Developing countries with a comparative advantage in agriculture (+); - Sub-Sahara regions and Mediterranean regions (-).

Legend: (+): is affected positively

(-): is affected negatively

(↑): increases

(↓): decreases

Authors (continued)	Research Objective	Model	Findings
Langley et al. (2006)	Compare the effects of trade liberalization on dairy production, consumption, prices and trade.	Partial equilibrium model with three scenarios for trade liberalization	<ul style="list-style-type: none"> - Low cost countries like New Zealand and Australia (+); - Countries with highly protected dairy markets (-); - World prices (⬆); - Production and trade (⬇).
Cox and Zhu (2005)	Analyze the impact of trade liberalization on economical and welfare indicators.	Two different scenarios eliminating domestic and trade policies between 2001 and 2005	<p>In the full trade liberalization scenario:</p> <ul style="list-style-type: none"> - Production (⬆); - Prices (⬇); - Consumers (+); - Losses are more important than the gains. <p>In both scenarios:</p> <ul style="list-style-type: none"> - Producers in Oceania and developing countries (+), consumers (-) and production (⬆); - Producers in Canada and the USA (-), prices (⬇). <p>In the second scenario where trade distortion is still present, producer gains are more important than consumer losses.</p>
Bouamra-Mechemache et al. (2002)	Determine the effects of partial market liberalization in the EU's dairy sector on prices, production, consumption, trade and producers, consumers and taxpayers' welfares.	General equilibrium model simulating four scenarios with the removal of production quotas with and without the elimination of domestic and trade policies. The model also assumed that changes for the year 2000 at the GATT level were all implemented.	<p>In all four scenarios for the EU:</p> <ul style="list-style-type: none"> - Milk production (⬆); - Milk prices (⬇); - Producer welfare (-); - Consumer and taxpayer welfare (+). <p>Producer losses are more important than consumer gains, except when subsidized are removed with production quotas.</p> <p>The scenario where all distortive measures are removed is the most beneficial overall.</p>
OECD (2004)	Study the impact of trade liberalization according to different commodities and OECD countries and non OECD countries.	Aglink, a partial equilibrium dynamic demand-supply model	<ul style="list-style-type: none"> - EU, Canada, Japan and Mexico: prices and production (⬇), consumption (⬆); - Countries with no market price supports (i.e. New Zealand, Australia, Brazil and Argentina): prices and production (⬆) slightly, consumption (⬇); - Small countries (+).

Legend: (+): is affected positively

(-): is affected negatively

(⬆): increases

(⬇): decreases

Authors (continued)	Research Objective	Model	Findings
OECD (2004)	Determine the effects of trade liberalization on the EU, USA, Mexico, Canada, Switzerland and Japan.	PEM, a partial equilibrium static model	<ul style="list-style-type: none"> - Japan (+); - Countries with highly protected dairy sectors: prices (↓); - World dairy prices (↑); - Taxpayers and consumers (+). <p>The more countries are involved in trade liberalization, the greater the benefits.</p> <p>With full trade liberalization, production becomes more efficient.</p>

Legend: (+): is affected positively

(-): is affected negatively

(↑): increases

(↓): decreases

The following section lays out our theoretical framework. We explain the chosen indicators of sector performance. Variables capable of influencing the performance of the dairy sector are identified from the literature review.

2.6. Trade Liberalization and the Performance of the Dairy Sector

Our theoretical framework considers the impact of trade liberalization on the performance of the dairy sector. This sector is chosen because of the strong presence of domestic and trade policies in many countries. We are mainly interested in the liberalization of trade through FTAs because of the growing importance of these agreements in nations' strategy to liberalize trade. However, since these agreements do not remove necessarily all tariffs and non-tariff barriers (Lloyd and Maclaren, 2004), it is important to determine if they still manage to have a positive influence on sector performance as stated by the theoretical effects of trade liberalization. Also, our literature review demonstrates that researchers seem to agree that multilateral trade is more beneficial than bilateral trade. Therefore, our model separates bilateral FTAs from multilateral FTAs.

Our framework uses indicators of competitiveness as guides for sector performance. As mentioned, countries are expected to become more efficient and competitive as markets become more open and exposed to rivalry from foreign firms. Indeed, sector performance become important because "PTAs have grown and become the centerpiece of world trade diplomacy as countries seek to improve access to foreign markets for their exporters and investors" (Ahearn, 2011, p.1). Therefore, as efficiency improves, competitive sectors should show a higher performance level.

Approaches to measuring competitiveness are usually divided according to two disciplines. One approach, supported by the strategic-management school, identifies competitiveness through "the ability to profitably create and deliver value through

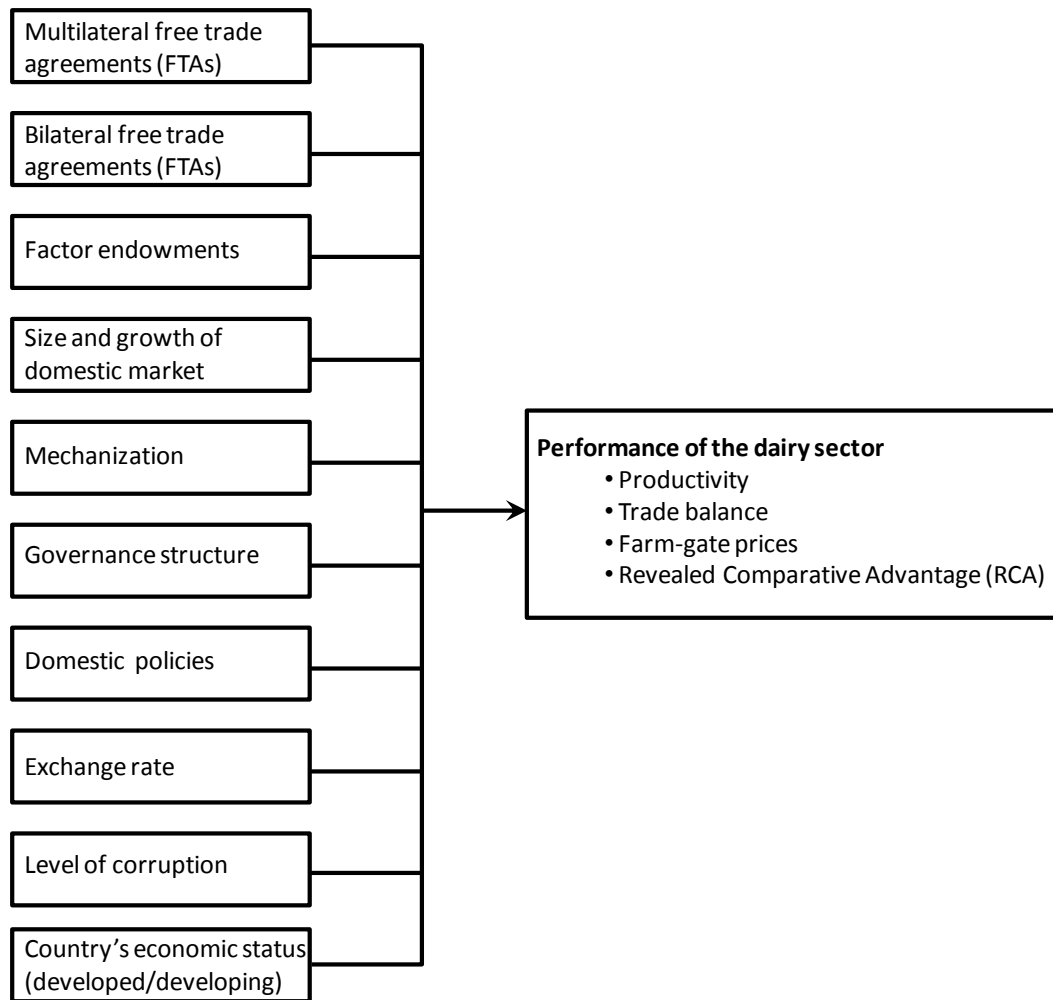
cost leadership or product differentiation” (Kennedy and Parr Rosson, 2002; p.279). Hence, this approach defines performance according to the firm’s structure and strategy and uses indicators such as productivity and efficiency (Latruffe, 2010). The second approach is based on neoclassical economics and analyzes factors influencing trade and trade indicators, such as comparative advantage, export and import indices and domestic or foreign market shares (Latruffe, 2010; Kennedy and Parr Rosson, 2002). A caveat with these two approaches, however, is that they do not clearly capture how the underlying factors of firms influence sector performance (Kennedy and Parr Rosson, 2002).

As suggested by Latruffe (2010), our study relies on several indicators from both schools of thoughts to assess the performance of the dairy sector in several countries because this method can capture several dimensions of performance. These indicators are productivity (Kennedy and Parr Rosson, 2002; Ball et al., 2010; Urata, 2009; Omoregie and Thomson, 2001; Latruffe, 2010; Cho and Moon, 2000; Porter, 2008), sectoral trade balance (Lorde et al., 2010, Sarker and Jayasinghe, 2007; Korinek and Melatos, 2009), farm-gate prices (Fertö and Hubbard, 2003; Ball et al., 2010; Gorton and Davidova, 2001) and the Revealed Comparative Advantage indicator (RCA) (Lorde et al., 2010; Wu and Thomson, 2003; Fertö and Hubbard, 2003; Latruffe, 2010; Korinek and Melatos, 2009).

While FTAs influence sector performance (Urata, 2009), other factors can also affect performance in the agricultural sector: factor conditions such as factor endowments (Pikkety et al., 2009; Fertö and Hubbard, 2003; Latruffe, 2010; Henry et al., 2006), size and growth of domestic market (Henry et al., 2006), mechanization of the agricultural sector (Henry et al., 2006; Marijanović, 2001; Pikkety et al., 2009), governance structure (Henry et al., 2006), domestic policies such as subsidies (Kennedy and Parr Rosson, 2002; Fertö and Hubbard, 2003; Kennedy and Parr Rosson, 2002; Grueniger, 2008; Rude and Meilke, 2002; Josling, 1998; Pye Nyo, 2009; Hobbs, 2001; Latruffe, 2010), exchange rates (Omoregie and Thomson, 2001;

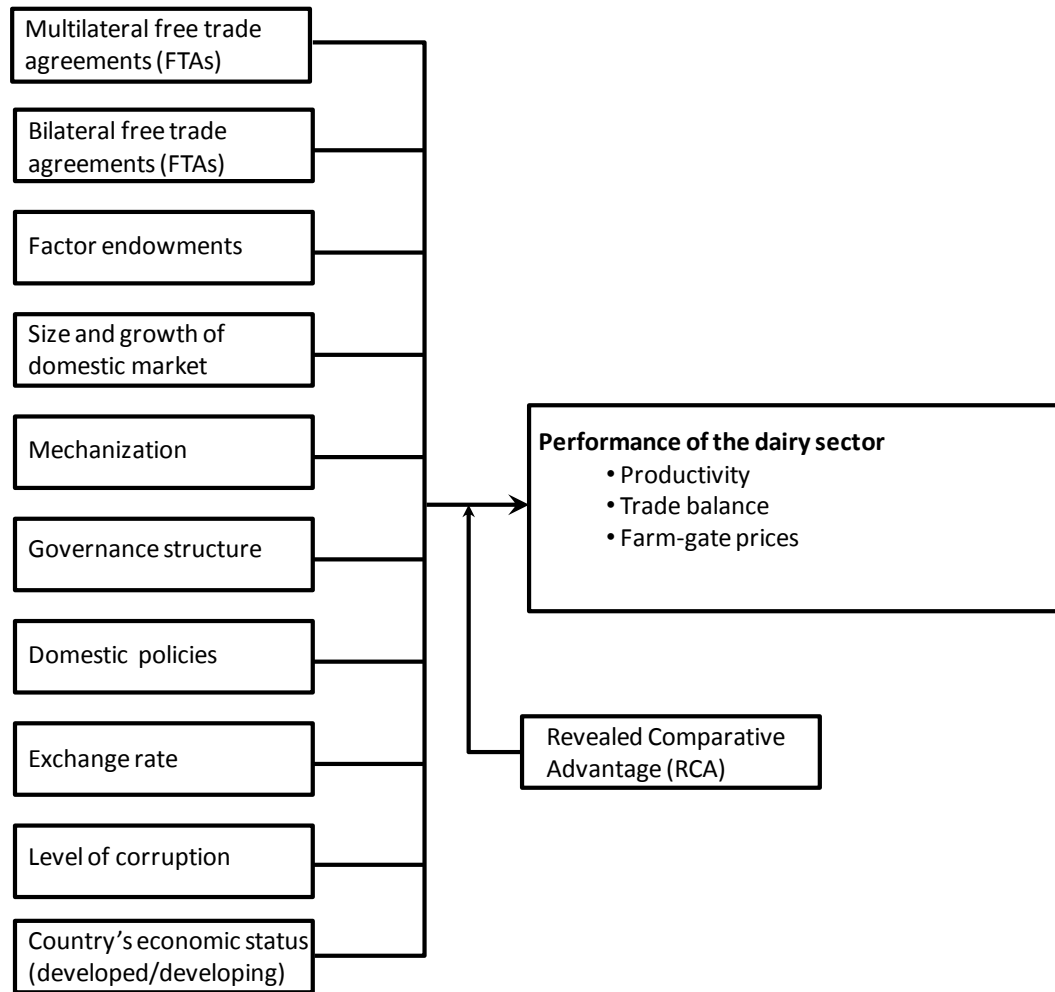
Henry et al., 2006; Kennedy and Parr Rosson, 2002; Ahearn, 2011), and the level of corruption in a country (Laurentiu, 2009) (Figure 1). While our research focuses on the effects of FTAs on the performance of the dairy sector, our model will control for these other factors. Figure 1 represents our theoretical framework.

Figure 1: Performance of the Dairy Sector Model: Indicators and Factors



This figure represents the theoretical model with the indicators and factors identified in the literature review influencing the performance of the dairy sector.

Figure 2: Performance of the Dairy Sector Model: Indicators, Factors and Condition



This figure represents the modified theoretical model of the performance of the dairy sector. In this model, we control for the RCA's moderating effect on the other indicators of performance as explained in the next section.

2.6.1. Indicators of Sector Performance: Definitions

Productivity. Productivity can be defined as “the ability of production factors to produce the output” (Latruffe, 2010; p. 18). While Latruffe argues that efficiency and

economy of scales can positively affect productivity, FTAs affect both production and consumption levels (Urata, 2009).

Sectoral Trade Balance. By liberalizing trade, FTAs create new trade flows between country members (Henry et al., 2006). Sectoral trade balance equals exports minus imports. In fact, Balassa argues that exports, which reflect the relative costs of production, can indicate where a country has a comparative advantage, especially when production costs are unknown (Lorde et al., 2010).

Farm-gate Prices. These prices correspond to the prices farmers received for their goods at farm gates or the first point of sale (UN FAO STAT; Ball et al., 2010).

Revealed Comparative Advantage (RCA). A country's export performance revealed by its comparative advantage is an indicator of international trade specialisation and performance (Lorde et al., 2010). According to Wu and Thomson (2003), the RCA is the most conventional measure for analyzing trade performance (Fertö and Hubbard, 2003). If a country is found to have a higher RCA, it is a strong exporter in that sector and as such, is more competitive because it has a comparative advantage in that sector (Latruffe, 2010; Wu and Thomson, 2003). Some scholars argue that RCA can be misleading since government interventions can distort trade (Lorde et al., 2010; Fertö and Hubbard; 2003). However, Grueniger (2008) argues that in general, most trade distortion occur in imports because most distortive domestic and trade policies such as import quotas are found on the import side. In fact, as mentioned above, several export policies encourage exports rather than restrict them. This, however, is not the case with import policies. As such, RCA is still a good measure because it looks at the export side. Even though we treat RCA as an indicator of performance, it is important to note that since RCA is a measure of comparative advantage, it sometimes has a moderating effect on other indicators. We will control for this in our model (Figure 2).

To our knowledge, there are no cross-country studies evaluating FTA effects on the trade performance of the dairy sector, analyzing the differences in the effects of multilateral vs. bilateral FTAs or contrasting the effects on developed and developing countries over an extended period of time. Our goal here is to contribute to the literature on trade liberalization in the agricultural sector by examining the effects of trade liberalization through multilateral and bilateral FTAs on the performance of several developed and developing countries' dairy sectors. Therefore, our principal research questions are: what are the effects of trade liberalization, namely through FTAs, on the performance of the dairy sector across a series of developed and developing countries over a 20-year period (1990-2009)? Are the effects different for developed and developing countries? Do they differ between multilateral and bilateral FTAs?

In the following section, we explore different hypotheses according to the indicators of performance. The theoretical and empirical effects of trade liberalization discussed above are used to explain the potential effects of FTAs on the performance of the dairy sector.

3. HYPOTHESES

3.1.Productivity

To be competitive, a nation has to be able to increase its production efficiency (Grueniger, 2008; Cho and Moon, 2000, p. 185). Indeed, the literature review mentions that trade liberalization increases efficiency, especially in sectors with a comparative advantage in the agricultural sector (Zhu et al, 1999). With a computable general equilibrium model assessing the effect of trade liberalization on the agricultural sector in East Asia, Pye Nyo's (2009) model removed *ad valorem* tariff and non-tariff barriers, but maintained such barriers for non-members of the trade

agreements. The author concludes that trade liberalization tends to encourage economic growth, decrease poverty and increase income and productivity in areas in which the regions have a comparative advantage (Pye Nyo, 2009). Similarly, in a study on the effects of FTAs on Japan's and East Asia's competitiveness, Urata (2009) found that multilateral or other types of FTAs will lead to a decline in the competitiveness and productivity in their primary industries such as agriculture. With regard to Japan, the author argues that it does not have a comparative advantage in primary industries using natural resources or unskilled labour in production. The study was done using a model based on computable general equilibrium (Urata, 2009).

H1a: Multilateral FTAs have a positive effect on productivity in countries that have an RCA in the dairy sector.

H1b: Bilateral FTAs have a positive effect on productivity in countries that have an RCA in the dairy sector.

3.2. Sectoral Trade Balance

In theory, a country is a net exporter of a good in which it has abundant production factors and as such, has a comparative advantage (Chen, 2000; Kennedy and Parr Rosson, 2002). When a country can export more than it imports, it can produce enough surpluses to sell in other markets and is thus more competitive (Kennedy and Parr Rosson, 2002). Hayakawa and Yamashita (2011; p. 13) find that "positive PTAs are likely to emerge by increasing the level of trade flows among member countries". As discussed above, trade liberalization opens market and removes barriers to trade. Thus, it is argued that it offers trade opportunities to exporters and should, therefore, increase trade flows as exporters increase their productivity to seize these opportunities. In a study on the impact of three PTAs (AFTA, COMESA and MERCOSUR) on agricultural trade, Korinek and Melatos (2009) found that there

was trade creation in every RTA. For all three RTAs, the country's comparative advantage was an important factor in creating trade. The study was done using a gravity model which analyzes ex-post bilateral trade flows over a certain period of time while controlling for important factors such as trading partners' GDP, distances between the partners, common language, culture and asymmetry of members (Korinek and Melatos, 2009).

H2a: Multilateral FTAs have a positive effect on sectoral trade balance in countries that have an RCA in the dairy sector.

H2b: Bilateral FTAs have a positive effect on sectoral trade balance in countries that have an RCA in the dairy sector.

3.3. Farm-gate Prices

In theory, trade liberalization reduces costs, increases efficiency and provides consumers with cheaper goods (Pye Nyo, 2009, Belhja Hassine and Kandil, 2009; Yeager and Tuerck, 1984; Westhoff et al., 2004) by promoting competition in the marketplace and by opening markets, especially to low cost imports (Rude and Meilke, 2002). Dairy product producers with a cost advantage will become more competitive on the market. Therefore, one can expect FTAs to decrease farm-gate prices. Kavallari and Schmitz (2008) suggest that free trade for the EU's Mediterranean partner countries would have the most impact on their commodities like beef, milk and sugar. Their research analyzes the effects of preference erosion on the EU's Mediterranean partner countries' agricultural sector with a partial equilibrium, multi-commodity and multi-region world trade model. The authors conclude that there would be a drop in commodity prices and in farmers' incomes.

However, because there is so much trade distortion in the dairy sector, it was found in the literature review that trade liberalization would have mixed effect on domestic

milk prices and global milk prices. The reason being that current world milk prices are depressed because many developed countries subsidize their exports (Cox and Zhu, 2005). In other words, many developed countries sell their surpluses on foreign markets at lower prices because they receive subsidies to export these products in foreign markets. These subsidies decrease milk prices for all exporters in every country. It was argued that in countries with a high level of protection and price supports (i.e. most developed countries), their current domestic dairy prices are above world prices and the elimination of these policies would decrease prices (Cox and Zhu, 2005). Low cost milk producing countries without market price support and/or with a comparative advantage in the dairy sector (i.e. New Zealand and Australia) would see an increase in milk prices since their prices are already close to depressed world milk prices (OECD, 2004). Under the current distorted global dairy market, these countries lose from depressed prices, since they already operate at world milk prices whereas in a trade liberalization scenario they would benefit from an increase in world milk prices. Therefore, countries with a comparative advantage in the dairy sector should see the milk prices increase, while developed countries and countries with a high level of protection in the dairy sector should see their milk prices fall.

H3a: Multilateral FTAs have a positive effect on farm-gate prices in countries that have an RCA in the dairy sector.

H3b: Bilateral FTAs have a positive effect on farm-gate prices in countries that have an RCA in the dairy sector.

3.4.Revealed Comparative Advantage

Trade liberalization is argued to increase trade flows between countries (Urata, 2009). More specifically, FTAs help to secure market shares on the international market (Urata, 2009; Henry et al., 2006). Countries that gain or maintain market share are deemed competitive (Kennedy and Parr Rosson, 2002; Laurentiu, 2009). As

mentioned in the European Commission's definition of competitiveness, countries with a comparative advantage are able to increase their market shares because they can produce more efficiently or at lower cost (Gorton and Davidova, 2001, p. 187). In theory, trade liberalization increases efficiency by reallocating resources to more efficient uses (Yeager and Tuerck, 1984; Westhoff et al., 2004). It can thus be argued that as international markets become more open (i.e., through FTAs), the most competitive sectors in agriculture will gain in terms of factor endowments since these resources will be reorganized to increase production. Using RCA, Fertö and Hubbard (2003) argue that agricultural products for which Hungary has a comparative advantage could become more competitive if markets were less distorted.

H4a: Multilateral FTAs have a positive effect on RCA.

H4b: Bilateral FTAs have a positive effect on RCA.

3.5.Developed Countries and Developing Countries

While Urata (2009) claims that FTAs affect countries which are more dependent on trade, it is important to note that the agricultural sector in most developing countries is an important part of the economy because it is a considerable source of local employment (Zamroni, 2006; Parikh et al., 1989; WTO, 2003). Although most developing countries have a comparative advantage in unskilled labour (Meilke, 2000), several of them face many barriers to trade, and the weak performance of their agricultural sectors makes them net importers of basic foods (Alexandratos et al., 1994). The reality is that these countries possess less bargaining power than developed countries such as the EU (McQueen, 2002). Moreover, “small and highly specialised economies” may see their trade preferences to some of their key exporting markets erode because of lower barriers to trade in those markets (Bouët et al., 2005). Also, as mentioned above, the dairy sector in most developed countries

remains highly protected. Therefore, one can expect that FTAs are more beneficial to developed countries than developing countries.

H5a: Multilateral FTAs have a greater impact on the dairy sectors' performance in developed countries than in developing countries.

H5b: Bilateral FTAs have a greater impact on the dairy sectors' performance in developed countries than in developing countries.

3.6. Multilateral FTAs and Bilateral FTAs

The literature on FTAs seems to agree that the types of FTAs, multilateral or bilateral, have different effects on global welfare and global trade. In fact, “regional deals [FTAs] are more efficient and have more advantages than bilateral ones” (Zamroni, 2006; p. 51). However, the author warns that a regional FTA’s bargaining power can be compromised when a member country enters into another regional FTA. Overall, “multilateral trade liberalization generally is deemed preferable to preferential trade agreements on both economic and political grounds because it generates greater economy-wide benefits and is non-discriminatory” (Ahearn, 2011, p.1). The reality is that unlike multilateral trade, bilateral trade agreements do not help eliminate all barriers to trade and trade protection (Korinek and Melatos, 2009; Meilke and Warley, 1989).

H6: The performance of dairy sectors under multilateral FTAs is greater than the performance of the dairy sectors under bilateral FTAs.

In the next section, we explain our model. We also describe our sampling method and variables. Finally, we present our results which demonstrate that FTAs do have an

effect on several indicators of performance when a country has an RCA in the dairy sector.

4. METHOD

4.1. Sample

Our sample consists of 41 countries (20 developing and 21 developed countries). The panel for the analysis is composed of 20 period observations for each country (from 1990-2009); therefore, there are 820 observations in the analysis. Given that the countries in the analysis represent all the continents, they give a wide geographical basis for exploring global variance in FTA effects. These countries display marked diversities in dairy sector performance as well as in their participation in FTAs, and thereby provide a good ground for exploring FTA effects on the dairy sector's national performance.

4.2. Dependent Variables: Indicators of Dairy Sector Performance

The dependent variables in this research are the indicators of performance for the dairy sector identified in the literature review, namely, productivity, sectoral trade balance, farm-gate prices and RCA. The data for dependent variables come from the UN FAOSTAT website and the World Bank website (for a complete list of data sources for all variables see Appendix III). Productivity, measured by production in tonnes per hectare, includes the following dairy products: milk whole dried, butter and ghee, various cheeses, evaporated and condensed milk, skim milk and buttermilk dry. For consistency, the import and export data in US dollars used to calculate sectoral trade balance and the RCA include the same dairy products. Due to availability, data for the farm-gate prices (producer prices) in US dollar per tonne are

for whole fresh cow milk only. Revealed Comparative Advantage was calculated according to Balassa's formula:

$$RCA = (X_{ij} / X_{it}) / (X_{nj} / X_{nt}) = (X_{ij} / X_{nj}) / (X_{it} / X_{nt})$$

Where X represents exports, i is a country, j is an industry (dairy sector), t is a set of industries (dairy sectors) and n is a set of countries. RCA measures a country's exports in the dairy sector relative to its total exports and to the corresponding exports of a set of countries. A comparative advantage is "revealed" if $RCA > 1$.

4.3.Independent Variables: Bilateral and Multilateral FTAs

Our independent variables are the number of bilateral FTAs and multilateral FTAs concluded in a particular year adjusted by the trade volume occurring among the FTA participants. The variable was refined by taking into analysis only those agreements that had provisions relevant to the agricultural sector (each agreement was skimmed using "agriculture" search function). Of course, a further detailed qualitative study of all the agreements would be a good complementary study, but due to the quantitative nature of this research, the chosen approach to codifying the independent variables is appropriate since the purpose is to determine whether there is an effect on the performance of the dairy sector from the FTAs. A complementary qualitative analysis would help to analyze the causes and mechanisms of these effects, but it is beyond the scope of the present study. The list of FTAs still in force today was taken from the WTO website (see Appendices I and II for the table of number of the relevant bilateral and multilateral FTAs per country per year). If an FTA came into force late in the year (October to December), it was counted in the following year. Terminated FTAs were subtracted the year they were terminated since the months were not always provided. The list of terminated FTAs was compiled from several databases, but mostly refers to FTAs with countries that joined the EU in 1995, 2004

and 2007. The trade volume for FTAs consists of the same products as for sectoral trade balance and RCA (see Appendix III for a complete list of data sources for all variables).

4.4. Control Variables

As mentioned above, our control variables include factor conditions such as factor endowments, size and growth of domestic market, mechanization of the agricultural sector, governance structure, domestic agricultural policies, exchange rate and the level of corruption in a country. For factor endowments, we used permanent meadows, inland water bodies and agricultural population. Size and market growth were represented by GDP and GDP per capita. For mechanization of the dairy sector, we used the total of machinery in agriculture. Governance structure was captured with political stability, the Human Development Index (HDI), WTO membership and other types of PTAs. The HDI is an indicator of social and economic development and includes various data on health, education and living standards (UNDP). The variable for the number of PTAs in a given country is a compilation of customs unions (CU), partial scope agreements (PSA), economic integration agreement (EIA), partial preferential trade agreements, association agreements and protocol agreements. We used the Corruption Perception Index for the level of corruption in a country. Compiled by Transparency International, this index is based on the perception of corruption in the public sector. The data for domestic agricultural policies represent subsidies for periods of time (1990-1996; 1996-2003; 2003-2009) in percentages relative to the GDP (see Appendix III for complete data sources of our control variables). The data on subsidies come from the WTO tariff analysis that includes data on tariffs, tariff quotas, imports and countries' agricultural subsidies.

4.5.Data Analysis and Results

Pearson correlations among the variables and their descriptive statistics are presented in Table 3. Large standard deviations for our dependent and independent variables indicate that the data points are spread out over a large range of values; therefore, there is considerable variance in the selected indicators among the countries in the sample. Bivariate Pearson correlations suggest that there is a relationship between the FTAs and some of the indicators of the dairy sector's performance.

Table 3: Descriptive Statistics and Pearson Correlations*

	<i>1</i>	<i>2</i>	<i>3</i>	<i>4</i>	<i>5</i>	<i>6</i>	<i>7</i>	<i>8</i>	<i>9</i>	<i>10</i>
1. Productivity										
2. Trade Balance	0.36**									
3. Farm-gate Prices	0.15*	0.02								
4. RCA	0.48***	0.12**	0.05							
5. Multilateral FTAs	0.11	0.11*	-0.12*	0.04						
6. Bilateral FTAs	0.09	0.06	-0.17*	-0.02	0.11					
7. Developing	-0.18**	-0.38**	-0.41**	-0.46***	0.02	0.01				
8. HDI	0.07***	0.05***	0.12***	0.18***	0.07	0.06	-0.12***			
9. GDP	0.15***	0.17***	0.19***	0.10*	0.06	0.03	-0.09*	0.13*		
10. GDP Per Capita	0.13***	0.25***	0.31***	0.29***	0.09	0.05	-0.22***	0.19***	0.14**	
11. Exchange Rate	0.05	0.14*	0.02	0.16**	0.03	0.02	-0.14*	0.07	0.10*	0.12*
12. Meadow	0.29***	0.10**	0.06*	0.29***	0.12	0.09	0.07	0.02	0.04	0.02
13. Water	0.14**	0.05**	0.04	0.19**	0.05	0.07	0.12	0.08	0.02	0.03
14. Corruption	-0.17	-0.09*	-0.13**	-0.11***	-0.02	-0.03	0.25***	-0.22***	-0.10*	-0.12*
15. Political Stability	0.23	0.03*	0.08**	0.09*	0.09	0.08	-0.18*	0.18*	0.09*	0.17**
16. WTO	0.01	0.13	-0.32	0.03	0.22	0.14	-0.01	0.05	0.04	0.05
17. Population in Agric.	0.18***	0.12***	0.15	0.13*	0.05	0.10	0.11	0.03	0.03	0.04
18. Mechanization	0.31***	0.29***	0.25***	0.34***	0.15	0.12	-0.17***	0.12*	0.08*	0.22**
19. Subsidies	0.29***	0.47***	0.60***	0.53***	0.03	0.01	-0.14**	0.18**	0.12*	0.33**
20. Other Agreements	0.05*	0.07*	-0.10*	0.14	0.09	0.04	-0.02	0.09	0.05	0.06
Mean	1.59	3.95	1961958	0.76	0.73	3.72	0.28	0.64	9.00e+11	10282.95
S.D.	7.01	6.88	2.69e+07	1.18	0.82	5.79	0.45	0.16	4.41e+12	13661.39

<i>Continuation of table 3</i>	<i>11</i>	<i>12</i>	<i>13</i>	<i>14</i>	<i>15</i>	<i>16</i>	<i>17</i>	<i>18</i>	<i>19</i>	<i>20</i>
11. Exchange Rate										
12. Meadow	0.07									
13. Water	0.02	0.13*								
14. Corruption	-0.11	0.01	0.02							
15. Political Stability	0.09*	0.02	0.01	-0.06*						
16. WTO	0.03	0.04	0.02	0.01	0.05					
17. Population in Agric.	0.04	0.11*	0.03	0.08	0.09	0.04				
18. Mechanization	0.05	0.06	0.07	-0.11*	0.15*	0.02	0.06			
19. Subsidies	0.06	0.04	0.05	-0.12**	0.16**	0.08	0.07	0.15*		
20. Other Agreements	0.06	0.04	0.03	0.01	0.03	0.11	0.02	0.04	0.02	
Mean	565.82	76923.43	10917.88	4.50	-.106	0.62	6.06e+07	357464.3	2.93	1.45
S.D.	2129.18	387861.7	51723.29	2.39	1.02	0.48	3.07e+08	695946.4	6.89	1.13

*p <0.05, **p<0.01, ***p<0.001 (two-tailed)

*Pearson product–moment correlations

We use an econometric approach to panel data (organized as county/year) to control for unobserved heterogeneity (or biases due to unmeasured differences among the units of observation).

The general model is as follows:

$$\begin{aligned} \text{Indicator of the dairy sector's performance 1990-2009} = & \alpha + \beta 1 \text{ FTA_MULT} \\ & + \beta 2 \text{ FTA_BIL} + \beta 3 \text{ HDI} + \beta 4 \text{ GDP} + \beta 5 \text{ GDP_PERCAP} + \beta 6 \text{ EXCH} + \beta 7 \\ & \text{MEADOW} + \beta 8 \text{ WATER} + \beta 9 \text{ CORRUPT} + \beta 10 \text{ POL_STAB} + \beta 11 \\ & \text{WTO_MEM} + \beta 12 \text{ POP_AGR} + \beta 13 \text{ MECH} + \beta 14 \text{ SUB} + \beta 15 \\ & \text{OTHER_AGREM} + U_i + \varepsilon_{it} \end{aligned}$$

Where an indicator of the dairy sector's performance for a given country-year is a function of multilateral FTA agreements, bilateral FTA agreements, human development index, GDP, GDP per capita, exchange rate variability, meadow pastures, inland water, corruption index, political stability, WTO membership, population in agriculture, mechanization of the dairy sector, subsidies to farmers, and other types of agreements.

The error term in this model is composed of two parts: a unit-level effect that does not vary across time (U_i), and an idiosyncratic error term that varies across units and across time points (ε_{it}). Panel-data estimators help us avoid the shortcomings of traditional ordinary least squares (OLS) methods that ignore intra or within-panel correlation. Given that our analysis contains both slowly-changing and time-invariant variables (e.g., WTO membership or developed/developing economy status), a random effects model would be preferable since the fixed effects model uses only the 'within' variance and ignores the 'between' variance and is inefficient in estimating the impact of unchanging, rarely or slowly changing variables. However, the random effects model has important assumptions which need to be supported. Therefore, we

run several tests to verify the efficiency of the random effects model against the fixed effects model. The results of the Breusch and Pagan Lagrangian multiplier test of random effect, the Hausman test and the test for the assumption about the error term structure indicate that the assumptions of the random effects model do not hold.

However, using the fixed effects model in our case is inefficient for the reasons mentioned above. Therefore, we experimented with different compromise models. The results of these experiments indicate that it is efficient to use the ‘fixed effects vector decomposition’ model, which shows good model fit and gives us a rigorous estimate of the model’s parameters. This method allows us to keep the advantages of the fixed effects model while also including our time-invariant variables and our slowly-changing variables in the model (Plumper and Troeger, 2007).

The model is estimated in three stages: at the first stage the standard fixed effects model is estimated to obtain estimates of the unit effects. In the second step, the procedure splits the unit effects into an explained and an unexplained part by regressing the unit effects on the time-invariant and/or rarely changing explanatory variables of the original model. Finally, the third stage performs a pooled-OLS estimation of the baseline model by including all explanatory time-variant variables, the time-invariant variables, the rarely changing variables, and the unexplained part of the FE vector. This third stage allows computing correct standard errors for the coefficients of the (almost) invariant variables. In addition, one can conveniently use this stage to adjust for serial correlation of errors (Plumper and Troeger, 2007).

To account for the heteroskedasticity problem, we use robust standard errors. We also check for possible autocorrelation of the idiosyncratic disturbances using the Wooldridge test (Wooldridge, 2002, pp. 282–283), the results of which indicate that there is no first-order autocorrelation. We run 4 separate regressions to trace the effects of our independent variables on the 4 dependent variables. Table 4 presents

the results of the analysis conducted using the fixed effects vector decomposition model.

To evaluate the effects of FTAs on developed vs. developing countries, we further split our sample into developed and developing countries and run 8 separate regressions (controlling for the same set of factors) (Tables 5 and 6).

Table 4: Fixed Effects Vector Decomposition Model Estimates/ Total sample

	Regression1: Productivity*RCA	Regression2: Trade Balance*RCA	Regression 3: Farm-gate Prices*RCA	Regression 4: RCA
Multilateral FTAs	0.14*** (0.001)	0.24*** (0.001)	-0.12 (0.179)	0.18 (0.184)
Bilateral FTAs	0.06*** (0.001)	0.08*** (0.001)	-0.03 (0.035)	0.10 (0.116)
HDI	0.28 (0.293)	0.03*** (0.001)	0.05*** (0.001)	0.11*** (0.001)
GDP	0.10** (0.024)	0.14* (0.069)	0.15** (0.073)	0.20*** (0.001)
GDP Per Capita	0.12*** (0.001)	0.19*** (0.001)	0.37*** (0.001)	0.39*** (0.002)
Exchange Rate	0.01 (0.017)	0.04** (0.002)	0.06 (0.062)	0.05** (0.002)
Meadow Pastures	0.41*** (0.001)	0.09*** (0.001)	0.22 (0.235)	0.52*** (0.001)
Inland Water	0.007*** (0.001)	0.004*** (0.001)	0.009 (0.017)	0.02*** (0.001)
Corruption	-0.55 (0.592)	-0.40 (0.434)	-0.11** (0.045)	-0.13** (0.057)
Political Stability	0.32 (0.328)	0.26 (0.265)	0.05* (0.025)	0.08*** (0.001)
WTO Membership	0.59 (0.591)	0.61 (0.630)	-0.46 (0.466)	0.27 (0.273)
Population in Agriculture	0.10** (0.046)	0.04** (0.017)	0.15 (0.158)	0.003** (0.001)
Mechanization	0.27*** (0.001)	0.16*** (0.001)	0.19*** (0.001)	0.35*** (0.001)
Subsidies to Farmers	0.44*** (0.001)	0.37*** (0.001)	0.51*** (0.001)	0.48*** (0.001)
Other Types of Agreements	0.17*** (0.001)	0.21*** (0.001)	-0.003* (0.002)	0.56 (0.565)
<i>R Square</i>	0.28	0.27	0.25	0.26
<i>N</i>	820	820	820	820

*p < 0.05, **p < 0.01, ***p < 0.001 (two-tailed); Prob > F = 0.0000; the table presents beta coefficients and robust standard errors are given in parentheses.

Table 5: Fixed Effects Vector Decomposition Model Estimates/ Effects on developed countries

	Regression1: Productivity*RCA	Regression2: Trade Balance*RCA	Regression 3: Farm-gate Prices*RCA	Regression 4: RCA
Multilateral FTAs	0.20*** (0.001)	0.27*** (0.001)	0.02 (0.024)	0.19 (0.200)
Bilateral FTAs	0.10*** (0.001)	0.14*** (0.001)	-0.08 (0.088)	0.26 (0.274)
HDI	0.34 (0.363)	0.05 (0.055)	0.10 (0.112)	0.03*** (0.001)
GDP	0.04** (0.016)	0.12* (0.059)	0.37 (0.394)	0.07*** (0.001)
GDP Per Capita	0.09*** (0.001)	0.12*** (0.001)	0.14*** (0.001)	0.16*** (0.002)
Exchange Rate	0.08 (0.085)	0.05* (0.002)	0.11 (0.132)	0.10 (0.124)
Meadow Pastures	0.29*** (0.001)	0.10*** (0.001)	0.02*** (0.001)	0.31*** (0.001)
Inland Water	0.006*** (0.001)	0.005*** (0.001)	0.007 (0.016)	0.02*** (0.001)
Corruption	-0.49 (0.465)	-0.42 (0.496)	-0.10** (0.048)	-0.12** (0.056)
Political Stability	0.35 (0.355)	0.20 (0.232)	0.03 (0.036)	0.08 (0.084)
WTO Membership	0.50 (0.518)	0.47 (0.482)	-0.12 (0.124)	0.19 (0.207)
Population in Agriculture	0.04*** (0.001)	0.02* (0.011)	0.14 (0.145)	0.001*** (0.0001)
Mechanization	0.15*** (0.001)	0.07*** (0.001)	0.10*** (0.001)	0.19*** (0.001)
Subsidies to Farmers	0.40*** (0.001)	0.30*** (0.001)	0.43*** (0.001)	0.41*** (0.001)
Other Types of Agreements	0.11*** (0.001)	0.21*** (0.001)	-0.005** (0.002)	0.58 (0.601)
<i>R Square</i>	0.29	0.28	0.26	0.25
<i>N</i>	420	420	420	420

*p < 0.05, **p < 0.01, ***p < 0.001 (two-tailed); Prob > F = 0.0000; the table presents beta coefficients and robust standard errors are given in parentheses.

Table 6: Fixed Effects Vector Decomposition Model Estimates/ Effects on developing countries

	Regression1: Productivity*RCA	Regression2: Trade Balance*RCA	Regression 3: Farm-gate Prices*RCA	Regression 4: RCA
Multilateral FTAs	0.03** (0.018)	0.12*** (0.001)	-0.33 (0.387)	0.12 (0.125)
Bilateral FTAs	0.02 (0.034)	0.004*** (0.001)	-0.58 (0.593)	0.05 (0.063)
HDI	0.07** (0.032)	0.01* (0.005)	0.15 (0.159)	0.23 (0.282)
GDP	0.15*** (0.001)	0.24*** (0.002)	0.31*** (0.004)	0.39*** (0.001)
GDP Per Capita	0.09*** (0.001)	0.10*** (0.001)	0.42*** (0.001)	0.17*** (0.001)
Exchange Rate	0.20 (0.237)	0.09*** (0.001)	0.15 (0.162)	0.45 (0.460)
Meadow Pastures	0.57*** (0.001)	0.13*** (0.001)	0.02 (0.033)	0.49*** (0.001)
Inland Water	0.06*** (0.001)	0.05*** (0.001)	0.10 (0.123)	0.26*** (0.001)
Corruption	-0.18** (0.082)	-0.03*** (0.001)	-0.18* (0.090)	-0.03** (0.013)
Political Stability	0.003** (0.001)	0.44 (0.458)	0.10*** (0.001)	0.09*** (0.001)
WTO Membership	0.12 (0.138)	0.14 (0.147)	-0.54 (0.629)	0.33 (0.413)
Population in Agriculture	0.28 (0.292)	0.13** (0.061)	0.22 (0.254)	0.005** (0.002)
Mechanization	0.53*** (0.001)	0.28*** (0.001)	0.19*** (0.002)	0.51*** (0.001)
Subsidies to Farmers	0.35*** (0.001)	0.21*** (0.002)	0.32*** (0.004)	0.30*** (0.001)
Other Types of Agreements	0.02 (0.030)	0.26 (0.275)	-0.001* (0.0005)	0.24 (0.259)
<i>R Square</i>	0.25	0.27	0.24	0.23
<i>N</i>	400	400	400	400

*p <0.05, **p<0.01, ***p<0.001 (two-tailed); Prob > F = 0.0000; the table presents beta coefficients and robust standard errors are given in parentheses.

The analysis shows interesting results. Hypotheses 6, 5a and 5b are supported since both multilateral and bilateral FTAs appear to have greater benefits for developed countries than for developing countries whereas multilateral FTAs yield greater benefits than bilateral FTAs. Hypotheses 1a, 1b, 2a, 2b are also supported. Revealed comparative advantage proved to be an important condition for a country to benefit from both bilateral and multilateral FTAs. No statistically significant evidence was found for hypotheses 3a, 3b, 4a, and 4b indicating that multilateral and bilateral FTAs do not have statistically significant positive effects on farm-gate and positive effects on RCA. At the same time, we experimented with removing RCA as a condition from our dependent variables, and the results indicated that while developed countries (even those without RCA in the dairy sector) slightly gain from multilateral FTAs (and the effect of bilateral FTAs is not statistically significant), developing countries that do not have RCA in the sector lose dramatically both from multilateral and bilateral FTAs.

In the next section, we discuss our results and their implications for policymakers and dairy producers. We also explore some of our study's shortcomings as well as avenues for further research on agricultural sector performance and FTAs.

5. DISCUSSION

Although FTAs have proliferated since the 1990s, there has been considerable controversy regarding their effects on the performance of farms/firms, sectors and nations. This research contributes to the literature on the subject by focusing on the dairy sector over a 20-year period. Our empirical evidence includes effects on a number of indicators, as suggested by Latruffe (2010), in order to assess several dimensions of performance. Unlike most research on the subject focusing on a single country, FTA or region, our analysis was carried out across a heterogeneous set of countries over an extended time period.

Overall, the results suggest that FTAs do influence the performance of the dairy sector. The analysis also confirms that comparative advantage plays a role in determining the sector's performance level. In fact, our research demonstrates that FTAs positively affect a nation's productivity and sectoral trade balance when it has an RCA in the dairy sector. This would imply that FTAs are more advantageous and offer more opportunities for countries with abundant factor endowments necessary for the production of dairy products, as stated by the theory of comparative advantage.

This research has considerable implications for policymakers and dairy producers around the world, especially since this sector is one in which domestic and international policies still regulate trade and act as barriers to trade. Indeed, our results show that the effects of FTAs vary according to country and agreement type. Our analysis demonstrates that developing countries and those without a comparative advantage in the dairy sector do not gain as much from FTAs as developed countries or countries with a comparative advantage in the dairy sector. So, in general, these developing countries, especially with a comparative advantage in the dairy sector, might benefit from FTAs, but not nearly as much as developed countries. These findings are interesting because it is agreed that many developing countries have a comparative advantage in agriculture and unskilled labour. Therefore, it would suggest FTAs still create some discrimination against developing countries. We may make some conjectures as to why this discrimination might still be present in FTAs based on motivations to participate in FTAs and the agreements' and dairy sector's characteristics discussed in the literature review. Firstly, it is plausible that the multitude of overlapping trade agreements create costs which developing countries, even those with a comparative advantage, cannot sustain to remain competitive. Secondly, developing countries often act as spokes, while developed countries act as hubs. It was argued in the literature review that spokes are often dependent on hubs. Because some developed countries may not be as efficient in agriculture as developing countries, these developed countries may choose to only partially liberalize trade to protect their dairy sector and dairy exporters from potential losses.

Since developing countries are dependent on the hubs' markets, they may see no other alternative than to accept the hubs' less than beneficial terms of trade presented in certain FTAs. Similarly, when considering the domino effect, some developing countries may enter FTAs in order to maintain their preferential access to certain key markets. Thus, they may be forced into unbeneficial FTAs or FTAs which benefit more developed countries simply because they do not want to be left out or discriminated. Overall, these conjectures would suggest that developed countries have more bargaining power when entering FTAs and may thus maintain some barriers to trade and harmful domestic policies. These barriers and policies ultimately allow these countries to remain more competitive regardless of their comparative advantage. Thirdly, it is plausible that the nature of the FTAs is more advantageous for the dairy sectors in developed countries than in developing countries. As was explained in the literature review, the content of FTAs is not homogeneous and may be more or less liberalizing. It would seem that current domestic and trade policies may still pose significant trade barriers for developing countries, but less so for developed countries. Indeed, most FTAs are created for economical or political reasons rather than to enhance global welfare. Therefore, in the agricultural sector, policymakers should align their domestic policies with their comparative advantage in order to take full advantage of trade liberalization and avoid trade discrimination.

Also, gains appear to be greater in the case of multilateral FTAs than for bilateral FTAs, suggesting that policymakers should favour multilateral FTAs over bilateral FTAs. Indeed, in order to be less discriminating, an FTA should include many members. This encourages market access and trade with more equal rules for all the parties involved. Moreover, it is possible that overlapping bilateral FTAs create more barriers and increase transaction costs, as stated by the 'spaghetti bowl' theory discussed in the literature review. Consequently, trading rules can become confusing, while multilateral FTAs allow for more harmonious rules.

There was no statistical evidence to support the hypotheses about the positive relationship between FTAs and farm-gate prices and the positive relationship between FTAs and RCA. Firstly, the latter implies that the effects of FTAs on RCA are only positive if the country already has a comparative advantage in the dairy sector. In other words, FTAs will not help create a comparative advantage in the dairy sector unless a country already has one. In fact, if a country does not have an RCA, it will most likely be negatively affected by FTAs. This has important implications for nations with very limited factor endowments in the dairy sector. In an age in which they are increasingly exposed to competitive imports and in which food security and food risks are constant concerns, these nations are particularly vulnerable. Secondly, the theory of trade liberalization states that farm-gate prices should increase as markets become more open. However, some countries still use price-support programs or other policies to stabilize farm-gate prices (Gouin, 2004a). Moreover, while the data for farm-gate prices include milk prices only, it assumes that quality is homogenous. Our model also does not take into account any factors on the demand side which might explain the price difference between countries and years studied.

It is important to note that our results are macro-level results and do not explain the underlying factors of firm or producer performance. A caveat with this method is that the analysis does not take into account the quality of goods and assumes that goods across countries are homogenous. For example, an increase in market share can be a result of “high productivity and due to the prices and quality, variety and accuracy of the offered items” (Laurentiu, 2009, quoting Gavrilă, 2009; p.75). Moreover, while we control for the size and types of FTAs pertaining to agriculture, our analysis does not differentiate between the degrees of trade liberalization in a given FTA’s contents. Some agreements can be more liberal than others. Nevertheless, our method still presents strong results regarding the effects of FTAs on the performance of the dairy sector.

6. CONCLUSION

This research provides empirical evidence of the influence of bilateral and multilateral FTAs on several indicators of the dairy sector's performance. The results demonstrate that FTAs positively affect productivity and sectoral trade balance when a country has an RCA in this sector, suggesting that they allow countries with a comparative advantage in the dairy sector to benefit from new market opportunities by increasing productivity and trade flows. In addition, these findings suggest that food security and food risk issues are particularly important for nations without a comparative advantage in the dairy sector.

This research was carried out across a number of developed and developing countries over a 20-year period. The results confirmed that the gains from FTAs were greater for the dairy sectors in developed countries than in developing countries. This difference has many implications for policymakers when choosing FTAs partners and the content of such agreements. Extending the analysis over a 20-year period allowed for a panel study perspective of the effects FTAs have thus far had on the performance of dairy sectors in multiple countries. Policymakers should adjust their domestic and international policies to better reflect their comparative advantage in this sector. Moreover, the results show that multilateral FTAs are more beneficial to the dairy sectors than bilateral FTAs. Therefore, it would be more advantageous for policymakers to pursue these types of FTAs over bilateral ones.

Our hypotheses stating that FTAs positively affect farm-gate prices and that FTAs have a positive relationship to RCAs were not supported. These observations may be due to the fact that while we controlled for subsidies, we did not control for other distorting policies such as price-support programs. Moreover, the data do not include quality or demand-side factors that may play a role in determining farm-gate prices and the performance level of the dairy sector. Future research should explore these

variables. It is important to note that due to availability, data for farm-gate prices only include whole fresh cow milk. Thus, the results from this study showing no statistically significant effects of FTAs on farm-gate prices are valid only for fresh cow milk and care should be taken to generalize these results to other dairy products. It would also be interesting to see whether our results can be duplicated for other agricultural sectors and other types of PTAs.

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APPENDIX I – Table Number of Bilateral FTAs per Country per Year

[illegible]

[illegible]

APPENDIX II – Table Number of Multilateral FTAs per Country per Year

Number of Multilateral Free Trade Agreements (FTAs) per Country per Year																				
Country	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009
Algeria	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
Austria	1	1	1	1	1	2	2	2	2	2	2	2	2	2	2	2	2	2	2	3
Belarus	0	0	0	0	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Bosnia and Herzegovina	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	1
Bulgaria	0	0	0	0	0	0	0	0	0	1	1	1	1	1	1	1	1	2	2	3
Canada	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Chile	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	1	1
Czech Republic	0	0	0	1	1	1	1	1	1	1	1	1	1	1	2	2	2	2	2	3
Denmark	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	3
Egypt	0	0	0	0	0	0	0	0	1	1	1	1	1	1	1	1	1	1	1	1
Finland	1	1	1	1	1	2	2	2	2	2	2	2	2	2	2	2	2	2	2	3
France	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	3
Germany	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	3
Guatemala	0	0	0	0	0	0	0	0	0	0	0	0	1	1	1	1	2	2	2	2
Greece	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	3
Hungary	0	0	0	1	1	1	1	1	1	1	1	1	1	1	2	2	2	2	2	3
Honduras	0	0	0	0	0	0	0	0	0	0	0	0	1	1	1	1	2	2	3	3
Indonesia	0	0	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Ireland	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	3
Italy	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	3
Malaysia	0	0	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Mexico	0	0	0	0	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Morocco	0	0	0	0	0	0	0	0	1	1	1	1	1	1	1	1	1	1	1	1
Netherlands	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	3
New Zealand	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	1	1
Nicaragua	0	0	0	0	0	0	0	0	0	0	0	0	1	1	1	1	2	2	2	2

[illegible]

APPENDIX III – Data Sources

Variables	Data Source
Productivity, trade (import/export), producer prices, inland water bodies, permanent meadows, machinery, population in agriculture	UN FAO STAT (Food and Agriculture Organization of the United Nations). < http://faostat.fao.org/ >
GDP, GDP per capita, exchange rate, political stability and absence of violence and terrorism	WORLD BANK. <i>Data</i> , < http://data.worldbank.org/ >
Exchange rate for the Euro	OANDA. <i>Historical Exchange Rates</i> , < http://www.oanda.com/currency/historical-rates/ >
WTO membership and the list of FTAs still in force	<p>WORLD TRADE ORGANIZATION. <i>Regional Trade Agreements Information System (RTA-IS)</i>, <http://rtais.wto.org/UI/PublicMaintainRTAHome.aspx></p> <p>WORLD TRADE ORGANIZATION. <i>Members and Observers</i>, <http://www.wto.org/english/thewto_e/whatis_e/tif_e/org6_e.htm></p> <p>MCGILL. <i>PTAs, Preferential Trade Agreements Database</i>, Québec, Faculty of Law, McGill</p>

	University, < http://ptas.mcgill.ca/ >
List of terminated FTAs	<p>HAYAKAWA, Kazunobu and Nobuaki Yamashita (2011). “The Role of Preferential Trade Agreements (PTAs) in Facilitating Global Production Networks”, IDE Discussion Paper No. 280.2011.2, 25p., <http://ir.ide.go.jp/dspace/></p> <p>EUROPEAN UNION. “<i>Annex 1: List of Terminated Free Trade Agreements Among the New Members of the European Union</i>”, European Commission, Trade, 4p. <http://trade.ec.europa.eu/doclib/docs/2004/october/tradoc_119796.pdf></p> <p>EUROPEAN UNION. “List of Terminated Free Trade Agreements with Third Parties-Annex 2”, European Commission, Trade, 2p. <http://trade.ec.europa.eu/doclib/docs/2004/october/tradoc_119797.pdf></p> <p>HERDERSCHEE, Han and Zhaogang Qiao (2007). “Impact of Intra-European Trade Agreements, 1990-2005: Policy Implications for the Western Balkan and Ukraine”, International Monetary Fund, European Department, Issues 2007-2126, IMF Working Paper, May, p. 32, <">http://books.google.ca/books?id=pzWZ9vVbEgIC&pg=PA32&lpg=PA32&dq=trade+agreement+hungary+and+poland+and+faroe+islands&source=bl&ots=fCABzP1Px3&sig=svlDOHoHgTYrBGcWZIfp7sxmFw0&hl=en&sa=X&ei=_44oT867EKm40QGG1vjjAg&ved=0CEEQ6AEwBg#></p> <p>WORLD BANK (2010). <i>Global Preferential Trade Agreements Database: Agreements Library</i>, <http://wits.worldbank.org/gptad/library.aspx></p>

	<p>MINISTRY OF FOREIGN AFFAIRS OF THE REPUBLIC OF LATVIA. <i>Bilateral Agreements</i>, <http://www.am.gov.lv/en/policy/bilateral-relations/bilateral/?mode=out&state=UKR&tit></p> <p>THE EUROPEAN FREE TRADE ASSOCIATION (EFTA). <i>EFTA through the Years</i>, <http://www.efta.int/about-efta/history.aspx></p>
Lists of other types of PTAs	<p>WORLD TRADE ORGANIZATION. <i>Regional Trade Agreements Information System (RTA-IS)</i>, <http://rtais.wto.org/UI/PublicMaintainRTAHome.aspx></p> <p>WORLD BANK (2010). <i>Global Preferential Trade Agreements Database: Agreements Library</i>, <http://wits.worldbank.org/gptad/library.aspx></p> <p>SICE. <i>Foreign Trade Information System</i>, Organization of American States' Foreign Trade Information System, <http://www.sice.oas.org/agreements_e.asp></p> <p>GUUAM (GEORGIA, UKRAINE, UZBEKISTAN, AZERBAIJAN, MOLDOVA) (2000). <i>General Information: The GUUAM Group: History and Principles</i>, November, <http://www.guam.org/general/browse.html></p> <p>MINISTRY OF INDUSTRY AND FOREIGN TRADE ARAB REPUBLIC OF EGYPT (2008). <i>Industrial and Trade Agreements: COMESA Agreement</i>, Ministry of Trade & Industry, <http://www.mfti.gov.eg/english/Agreements/Comesa.htm></p> <p>ECONOMIC COOPERATION ORGANIZATION (ECO). <i>Brief History</i>, [last updated February</p>

	20, 2012], < http://www.ecosecretariat.org/MainMenu/briefhistory.htm >
Corruption Perception Index	TRANSPARENCY INTERNATIONAL. <i>Corruption Perception Index</i> , < www.transparency.org/cpi >
Human Development Index	UNDP. <i>Human Development Reports: Human Development Index</i> , < http://hdr.undp.org/en/statistics/hdi/ >
Subsidies	WTO tariff analysis, http://www.wto.org/english/tratop_e/tariffs_e/tariff_data_e.htm

Note: Data was retrieved from these websites between 2011 and 2012.

