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Argentina agrarian competitiveness.

A RCA approach and a comparison with other competitor countries

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Abstract

This paper studies the evolution of the Argentina's agrarian production competitiveness in the last decade, as the country is one of the main suppliers of agrifood for the whole world. The study starts with a review of different aspects of the agricultural innovation processes and trends over the last twenty years, the area expansion, as well as the recent public policies that have not benefited agrarian production. The case study then focuses on the agrarian export trends for the last years, since a Revealed Comparative Advantages (RCA) approach. A RCA comparison with other competitor countries is useful to confirm results. The paper draws preliminary conclusions on current strengths and constraints in relation to future Argentine agrarian production and export path, in a world that is demanding these exports.

Resumen

En este trabajo se estudia la evolución de la competitividad agraria argentina de la última década, ya que el país es uno de los principales proveedores globales de agroalimentos. El estudio comienza con una revisión de los diferentes aspectos de los procesos de innovación agrícola y tendencias en los últimos veinte años, la expansión de la superficie, así como las políticas públicas recientes que no han beneficiado a la producción agraria. El estudio de caso se centra en las tendencias de las exportaciones agrarias de los últimos años, desde un enfoque de Ventajas Comparativas Reveladas (VCR). Una comparación desde las VCR con otros países competidores es útil para confirmar los resultados. El documento llega a conclusiones preliminares sobre las fortalezas y las limitaciones actuales en relación a la futura trayectoria de la producción y la exportación agraria argentina, en un mundo que está demandando estas exportaciones.

JELCodes: F14, O13, Q17, Q18.

Keywords: Empirical Studies of Trade, Economic Development and Agriculture, Agriculture in International Trade, Agricultural Policy.

1. Introduction

This document studies the evolution of the Argentina's agrarian production competitiveness in the last decade, as the country is one of the main suppliers of agrifood for the whole world.

Trade and development are strictly connected; international trade has grown rapidly since modern economies were organized into industrial nations, and there has been a positive correlation between trade and development (Helpman, 2010). Nevertheless, globalization has not always improved development, considering social variables such as employment or poverty (Helpman, Itskhoki and Redding, 2010).

Imports of agricultural commodities into China from South American countries and also from the USA have grown rapidly since 2000. Sharp growth in China's presence in world trade since the beginning of the new decade in the 2000s changed world trade trends for most of the MERCOSUR countries. The traditional agricultural and food destination of South American exports mainly some countries of Europe and some intra-trade in the continent, was surprised by an increasing demand from China. International trade in soybeans has been especially important, since China's demand has been persistently strong (O'Connor, E. 2012; McFarlane, I. and E. O'Connor, 2014).

Argentina has been quite benefited from this situation, and agrarian production increased since the beginning of the '2000s till the end of the decade. Nevertheless, since 2010, increasing government intervention in agrarian markets has turned into a crisis for all agrarian chains and productions in 2015. Argentina is, since this point of view, a particular country, as main goods composing the export basket belong to the salary-goods category. Populist policies implemented in Argentina many times during the last 70 years suggest that salary-goods such as the ones derived from corn and wheat chains, as bread or beef production, may be object of protectionist policies to ensure domestic consumption, with local prices below international prices when the last ones have a sharp increase (Reca, L., 1980; Nogués, J., 2014).

This paper analyses this trend since a Revealed Comparative Advantage index approach (RCA), and compares Argentina's indexes with other results obtained for competitors countries.

The paper is organized as follows. Section 2 analyses the rise and fall of Argentina agricultural production for the period 1990-2015. Section 3 focuses on Argentina's recent trade trend since a CRA approach. Section 3 concludes with some policy recommendations.

1. Argentina agricultural production and growth: the rise and fall (1990-2015)

Argentina, as a primary goods and food producer, is the first world producer of sunflower, sunflower oil, concentrated lemon juice, fresh lemons and yerba mate, and the third largest producer of soybean oil and honey. As a food exporter, Argentina is the first global exporter of sunflower oil and fresh pears, the second largest exporter of peanut oil, a leading exporter of soybean and honey, the third largest exporter of beans and the fourth largest exporter of apple juice concentrate, among other food. The country had also been the first biodiesel exporter in 2011, as a part of the soybean chain.

The aggregate agricultural and livestock output for the period 1990-2014 shows the strong evolution of these sectors in the Argentine economy, and the fall trend registered since the last years. The data considered refers to sown area and production for the crop sector - including cereals and oil seeds- , and the livestock production.

Sown area in Argentina has grown from 20 million of hectares in 1990 to 33 million in the end of the 2000s, and 34 million in 2014. The first favorable shock for the Argentinean agriculture happened in 1991, when the new government eliminated the 41% tax rate on exports. The sown area started to expand, after a decade falling (-5.7 % in the 80s). In 1997, zero tillage practices spread in the pampas, and the sown area received new stimulus. In this decade, the sown area growth was 31.4%, reaching 25 million hectares.

In the 2000s, two important factors modified the incentives to produce more agricultural goods. After the great recession 1999-2001 and the big devaluation of 2002, tradable goods prices were nearly 260% higher (the exchange rate went from 1 = 1 to 1 = 3.6). The exchange rate went to 1 = 4 in July 2002, and then was stabilized in 1 = 3.60. Tradable goods, as agricultural production, got a strong improve in their relative prices, and sown area started to grow again, as profitability of farmers increased.

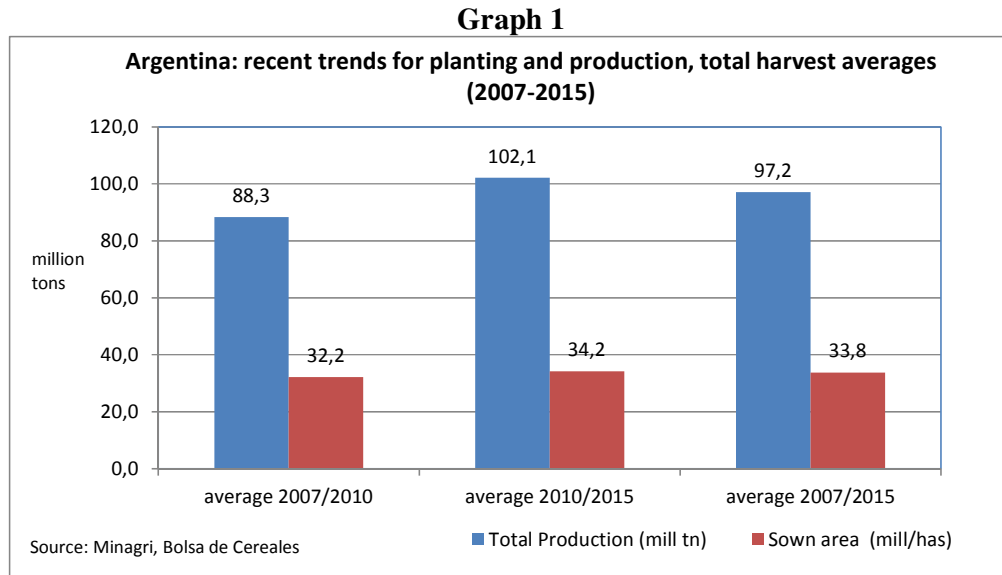
The international commodities price boom started since China's demand exponentially grew. The international commodities prices boom, since 2002, as China's demand started to increase exponentially, was a second positive shock to agricultural relative prices, and sown area continued increasing in Argentina along the decade.

Innovation and entrepreneurship have been relevant. The adoption of zero tillage, the use of Genetically Modified Seeds (for instance, glyphosate in soybeans RR) since 1997, the use of bio-inputs (inoculants), the appearance of the precision agriculture (AP) since the end of the 90s, for example the use of satellite data to calibrate seeding and fertilizer dosage, the use of services of machinery for soil preparation work, have been some of the main changes. The application of herbicides and pesticides, the increasing use of fertilizers, which passed from 600.000 tons in 1991 to 3.600.000 tons in 2007, and the "silo bag" innovation since 2000, to storage grains in the farm, reducing the dependence of the farmers on industry and traders, have been very important. The national agricultural machinery industry developed, mainly in the Provinces of Santa Fe and Córdoba, for example in the cities of Armstrong, Las Parejas and Marcos Juárez. The role of the INTA, the Agricultural National Innovation Institute, which has developed, with the private sector, technological improvements in genetics, agricultural machinery, precision agriculture, and value added systems (INTA, 2011). Changes in the agricultural production organization and growing importance of management, as some organizations of the private sector promoted innovation and production, such as Aapresid and CREA (Bisang, R., G. Anlló and M. Campi, 2008; Bolsa de Cereales, 2011).

The availability of extensive new areas for grains cropping, due to technological change was explained by the previous items. So, sown area grew 25%, totalizing 33 million of hectares in 2007/2008. In the last 20 years, agricultural production has followed the increment in the sown area, going from 34.4 million tons in 1990 to an average of 100 million tons in the period 2010-2015, reaching a maximum of 108 million tons in

2014/15, due to extraordinary rains during the summer harvest, and the partial introduction of a new genetically modified soybean grain (Minagri, Bolsa de Cereales).

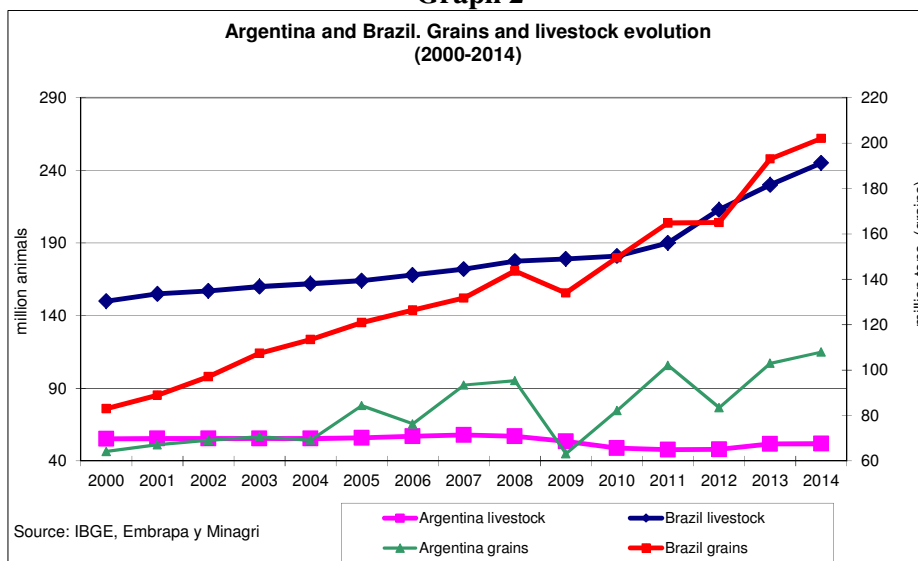
But since 2008, increasing policy restrictions have affected negatively Argentina's agrarian production. Interventionist and protectionist policies such as increasing export taxes, with rates of 35% for soybean exports, 23% for corn and 20% for wheat, export quantities restrictions, prohibitions and regulated prices for wheat, meat and corn, have affected profitability and detained private investment and innovation. As we can see in Graph 1, grains sown area and production have nearly not increased since 2010, considering moving averages of five years (Nogués, J., 2014).



An interesting comparison with Brazil's trends is useful. Argentina's grains production has gone from 64 million tons to 108 million tons from 2000 to 2014, but Brazil's one has increased from 83 million tons to 202 million tons.

The Argentine livestock sector has had a rather constant performance from 1990 to 2010. Beef consumption in Argentina is the highest in the world, with 69 kg/per capita in 2007, but it has fallen to 54 kg in 2014, due to adverse public policies affecting the sector since 2006 (such as prohibition of exports and internal price controls) – that resulted in lower production – (from 58 million animals in 2007 to 51 million in 2014). The contrast with the Brazilian production is evident, going from 150 to 245 million animals, and the loss of global markets has been a constant for Argentina during the last four years.

Graph 2



The result was a strong drop in Argentina’s agrifood exports in the last years. In addition to internal policies effects, international commodities prices dropped since the middle of 2014, as oil prices went from US\$/bl 110 to US\$/bl 50 in July 2015, and soybean prices went from US\$/tn 550 to US\$/tn 350 in the same period.

Table 1 shows the main exporting goods evolution between 2014 and 2011. It can be appreciated the strong fall in all the goods. The following section tries to analyze the competitiveness lost since a Revealed Comparative Advantage index approach.

Table 1

Argentina's agrarian exports (2011-2014)				
US dollar million				
Year	2011	2014	Total var.	% var.
Total Exports- goods	84.269	71.935	-12.334	-14,6
Wheat	2.495	659	-1.836	-73,6
Wheat flour	750	139	-611	-81,5
Soyabean	5.335	3.881	-1.454	-27,3
Soyabean oil	4.925	3.493	-1.432	-29,1
Soyabean flour and cake	9.789	12.577	2.788	28,5
Corn	4.312	3.506	-806	-18,7
Meat of bovine	1.164	1.106	-58	-5,0
Olive oil	71	43	-28	-39,4
Lemon, citrus and grapes	582	448	-134	-23,0
Apples, pears and quinces	611	561	-50	-8,2
Wines	744	901	157	21,1

Source: INDEC, ICA.

2. Consideration of Argentina’s recent trade trend: a CRA approach

The Revealed Comparative Advantage index (RCA) is an index used in international economics for calculating the relative advantage or disadvantage of a certain country in a certain class of goods or services as evidenced by trade flows. It is based on the Ricardian comparative advantage concept, but it most commonly refers to the index formulated by Balassa (1965)¹, which evolved from the historic two-country concept of comparative advantage, to broaden analysis to cover multiple participants and goods. The relations followed have been the following:

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

Where:

E_{ij} : exports of country i , commodity j ;

E_{it} : exports of country i , and a set of goods or commodities t ;

E_{nj} : exports of a set of countries or the world n , commodity j ;

E_{nt} : exports of a set of countries or the world n , and a set of goods or commodities t .

That is, the RCA is equal to the proportion of the country's exports that are of the class under consideration (E_{ij} / E_{it}) divided by the proportion of world exports that are of that class (E_{nj} / E_{nt}). A comparative advantage is revealed if $RCA > 1$. If RCA is less than unity, the country is said to have a comparative disadvantage in the commodity or industry. The RCA Index is applied here to Argentina's different agrarian exports goods.

We consider a Revealed Comparative Advantage for Argentina's agrarian products for the period 2003- 2014, for the following goods: Soybeans, Soybean oil, Soybean cakes; Wheat, Wheat Flour; Corn; Meat of Bovine Animals, Lemon, citrus and grapes; Apples, Pears and Quinces; Wines and Olive Oil. These goods represent the main grain and meat chains, so as a relevant selection of regional productions.

Table 2 presents the main results till 2014. Wheat and bovine meat chains register and important loss of competitiveness since 2008, as government intervention increased and exports annually decreased. Regional products have shown a downward trend for the last years, as the exchange rate appreciated and high inflation reduced profitability, so exports dropped. Soybean chains have been the most resistant, as they have only been affected by export taxes, but not with quantitative restrictions. Graph 3 is useful for understanding RCA trends for all the goods.

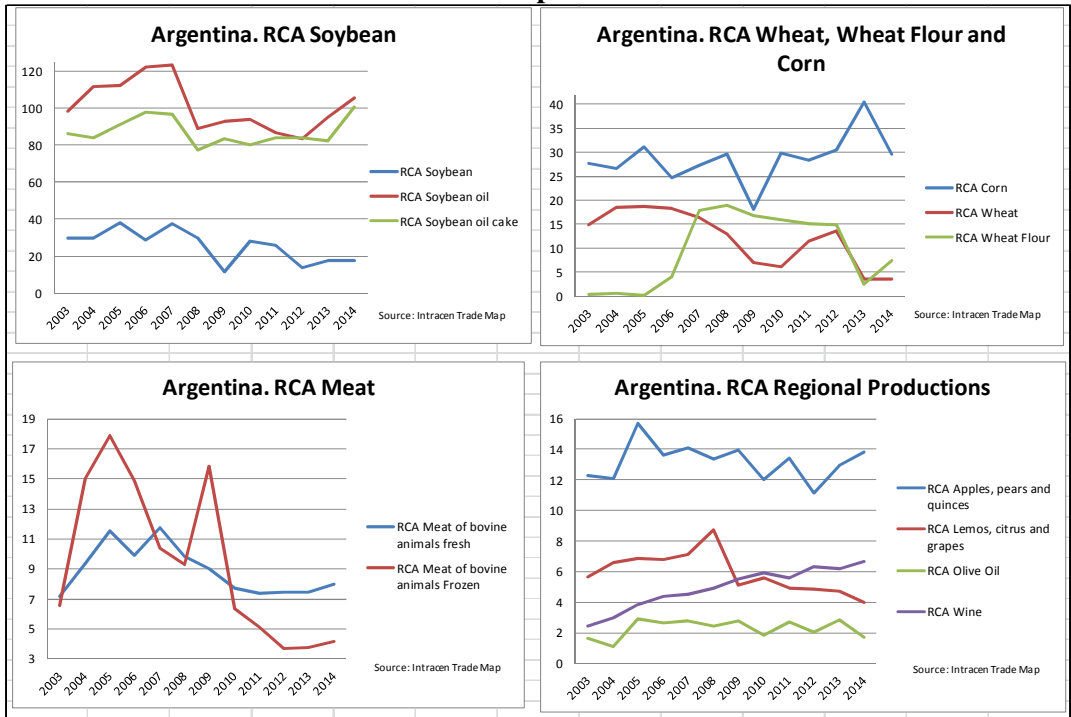
¹ *Balassa, Bela (1965), Trade Liberalization and Revealed Comparative Advantage*, The Manchester School, 33, 99-123. However, before Balassa introduced his famous RCA index in 1965, Liesner (1958) had already contributed to the empirical literature of RCA. In this sense, Liesner (1958) is the first empirical study in the area of RCA. A comprehensive and advanced measure of RCA was later on presented by Balassa (1965), and this is a widely accepted and afterwards modified measure of RCA in the literature. Other major RCA indexes reported after Balassa's, such as Bowen (1983), Vollrath (1991), Memedovic (1994), are not used in this paper, as Balassa (1965) is considered the most appropriate for this analysis.

Table 2

Revealed Comparative Advantage for Argentina 's agrarian products												
	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014
Wheat	15	19	19	18	16	13	7	6	11	14	4	3
Wheat Flour	0	1	0	4	18	19	17	16	15	15	3	7
Soybean	30	29	38	28	37	30	11	28	26	14	17	17
Soya-bean Oil	98	111	112	122	123	89	93	94	87	83	95	106
Soya-bean oil cake	86	84	91	98	97	77	83	80	84	84	82	101
Corn	28	27	31	25	27	30	18	30	28	31	41	29
Meat of bovine animals	7	12	14	12	11	10	12	7	6	6	6	6
Lemos, citrus and grapes	6	7	7	7	7	9	5	6	5	5	5	4
Apples, pears and quince	12	12	16	14	14	13	14	12	13	11	13	14
Wine	2	3	4	4	5	5	6	6	6	6	6	7
Olive Oil	2	1	3	3	3	2	3	2	3	2	3	2

Source: Intracen Trade Map

Graph 3



Finally, Table 3 takes into account a Revealed Comparative Advantage for Argentina *vis a vis* competitors selected countries, for each product.

For instance, Uruguay and Ukraine wheat have not lost long run RCA, but improved, just the opposite as Argentina did, due to a strongly regulated policy that has turned wheat production from 17 million tons to an average of 10 million tons for the last five years.

Surprisingly, soybean grains exports show a strong competitive loss, related to a slow increase of soybeans exports in the last years. In contrast, Brazil and Uruguay exports and RCA Index have been improving. Soybean oil and cakes have not had a significant change in the indexes.

Argentina's meat exports, such as wheat exports, are the goods that have registered a strong competitive loss since 2008. Brazil's bovine meat exports have been improving.

Regional productions do not show a negative evolution, as most problems for them have appeared in 2015, as Russian and Brazilian imports (main importers for fruits) have fallen in a recession process, and the appreciation of the peso mixed to an increasing inflation (38% annual change for the Congress Index, 24% annual change for the INDEC index) have limited competitiveness and exports.

Table 3

Revealed Comparative Advantage for Argentina and competitor countries

RCA WHEAT: ARGENTINA, URUGUAY, UKRAINE

	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014
RCA Wheat Argentina	15	19	19	18	16	13	7	6	11	14	4	3
RCA Wheat Ukraine	2	4	11	9	2	9	17	8	6	13	11	17
RCA Wheat Uruguay	0	0	2	2	2	8	19	22	15	16	12	14

RCA SOYBEAN: ARGENTINA, BRAZIL, URUGUAY

	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014
RCA Soybean Argentina	30	29	38	28	37	30	11	28	26	14	17	17
RCA Soybean BRAZIL	28	33	30	31	25	25	28	21	25	24	31	33
RCA Soybean Uruguay	8	18	19	26	28	25	31	40	40	54	67	56

RCA SOYA-BEAN OIL: ARGENTINA, BRAZIL, URUGUAY

	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014
RCA Soya-bean Oil Argentina	98	111	112	122	123	89	93	94	87	83	95	106
RCA Soya-bean Oil Brazil	24	24	21	18	17	17	13	11	12	13	10	10
RCA Soya-bean Oil Uruguay	0,0	0,0	0,0	0,0	0,0	0,0	0,1	0,2	0,0	0,0	0,0	0,0

RCA Soya-bean oil-cake: ARGENTINA, BRAZIL, URUGUAY

	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014
RCA Soya-bean oil cake Argentina	86	84	91	98	97	77	83	80	84	84	82	101
RCA Soya-bean oil cake Brazil	28	27	23	18	17	17	17	16	16	17	17	18
RCA Soya-bean oil cake Uruguay	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0

RCA Meat of Bovine: ARGENTINA, BRAZIL, URUGUAY

	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014
RCA Meat of bovine animals Argentina	7	12	14	12	11	10	12	7	6	6	6	6
RCA Meat of bovine animals Brazil	7	10	10	11	11	10	8	9	8	9	10	10
RCA Meat of bovine animals Uruguay	73	100	104	116	91	99	75	75	76	75	62	63

RCA WINE: ARGENTINA, CHILE

	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014
RCA Wine Argentina	2	3	4	4	5	5	6	6	6	6	6	7
RCA Wine Chile	13	12	11	9	9	11	12	12	12	13	14	13

RCA Apples, pears and quinces: ARGENTINA, CHILE

	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014
RCA Apples, pears and quinces Arg	12	12	16	14	14	13	14	12	13	11	13	14
RCA Apples, pears and quinces CHILE	29	25	18	17	18	24	18	18	19	21	23	23

RCA Olive Oil: ARGENTINA, SPAIN, ITALY

	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014
RCA Olive Oil Argentina	2	1	3	3	3	2	3	2	3	2	3	2
RCA Olive Oil Spain	21	23	21	21	24	26	24	29	27	27	23	31
RCA Olive Oil Italy	8	7	8	8	7	8	8	9	10	10	9	9

Source: Intracen Trade Map

3. Conclusions and policy recommendations

The RCA analysis is useful to determine a medium and long run trend for selected exports goods. The Argentina agrifood recent export trade trend has been revisited in order to understand whether the country is going in the world agrifood trade. The data and analysis confirms that some goods have lost competitiveness. Protectionist and interventionist public policy has been a main reason.

Some preliminary conclusions on the current strengths and constraints in relation to future Argentine agricultural and food export opportunities to the near future are detailed as follows.

The increasing food and agricultural trade between Argentina and Asia Pacific and developing countries since the 2000s has been a mere result of the sudden Chinese demand, and not an endogenous process.

For the next years, Argentina has the opportunity of opening new agricultural and food markets, in Pacific Asian Region and other developing countries of the world. To achieve this, an export –led growth strategy may be the first point.

So, public policies may be intelligent and long-run strategic, optimizing trade results and promoting tradable activities. Agricultural production may be one of the main objectives, among other sectors in an export strategy.

Soybean boom has not only has positive impact on the economy, but undesirable ones. Soybean expansion has effects on crop rotation and sustainability, land concentration and small farmers, rural development, and finally, on migration and urban poverty. These changes embrace structural, institutional, environmental and social aspects that Argentine national policies should take into account.

Argentina's production of wheat and corn should increase, in order to develop poultry, pork and beef chains, increase crop rotation and improve sustainability, diversify and increase exports. The trade-off exports / internal market may be solved by an increase in production that should generate new employment opportunities.

A public framework favourable to property rights and new technology change is a necessary condition, for best practices and new innovation. Improving rural infrastructure for domestic transport and export is another aim, to transport and store, for instance, 140 million tons in 2019(FADA, 2015).

The opportunity to provide more agricultural goods and food to the international food demand depends on national policies that should promote grains sown, livestock activity, and other regional economies such as fruits and other food.

References

- Balassa, B. (1965). Trade liberalization and “revealed” comparative advantage. *The Manchester School*, 33(2), 99-123.
- Bisang, Roberto, Guillermo Anlló y Mercedes Campi (2008). *Una revolución (no tan silenciosa). Claves para repensar el agro en Argentina*. Oficina de la CEPAL en Buenos Aires. 2008
- Bolsa de Cereales (2011) *Desarrollo productivo y cambio de paradigma. Diez años de agroindustria argentina. 2000-2010*. Instituto de Estudios Económicos. Bolsa de Cereales. Buenos Aires. Junio.
- Bowen, H. P. (1983). On the theoretical interpretation of trade intensity and revealed comparative advantage. *Weltwirtschaftliches Archiv*, 119, 464–472.
- FADA (2015). *Política agroalimentaria y agroindustrial. Lineamientos 2016-2019*. Río Cuarto, Córdoba Mayo de 2015.
- Helpman, E. (2010). *The mystery of economic growth*. Harvard University Press. ISBN 978-0674046054
- Helpman, E., Itskhoki, O., Redding, S. (2010). Inequality and unemployment in a global economy. *Econometrica*, 78(4), 1239-1283.
- Liesner, H.H. (1958), “The European Common Market and British Industry”, *Economic Journal*, 68, 302-16.
- McFarlane, Ian and Ernesto A. O’Connor (2014). “World Soybean Trade: Growth and Sustainability” (2014), *Modern Economy Journal*, Volume 5, Number 5, May 2014.
- Memedovic, O. (1994). *On the theory and measurement of comparative advantage : an empirical analysis of Yugoslav trade in manufactures with the OECD countries 1970-1986*, Amsterdam, Thesis Publishers.
- Nogués, J., (2014). Argentina, in Krivonos, E., Dawe, D., 2014. “Policy Responses to High Food Prices in Latin America and the Caribbean: Country Case Studies”. FAO, Rome. <http://www.fao.org/3/a-i3909e.pdf>
- O’Connor, Ernesto (2012). “Trade with China and strategy in South American recent economic development” (2012). *Revista de Economía Política. Brazilian Journal of Political Economy*. Vol. 32, nro 3 (128), Jul-Set 2012. São Paulo. Brasil.
- Vollrath, T. (1991). A theoretical evaluation of alternative trade intensity measures of revealed comparative advantage. *Weltwirtschaftliches Archiv*, 127, 265-280.
- Reca, L., 1980. “Argentina Country Case Study of Agricultural Prices and Subsidies”. World Bank Staff Working Papers N° 386, The World Bank.
- FAOSTAT (2015) Crops and livestock products. <http://faostat3.fao.org>
- Trade Map Intracen <http://www.intracen.org>