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Brazilian agricultural activities facing foreign direct investment

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ABSTRACT

Foreign direct investment in agricultural land may contribute to a shift in the aim of Brazilian food policies toward commodities of higher market value instead of the ones essential to local production and also the concentration of these valuable products which may threaten the food security of this society. Therefore, the aim of this paper is to analyse the effects of foreign direct investments in Brazil on the food security of this country. This study searched for indexes related to food security according to others author's arguments. Since there is no available data related directly to land acquisitions by foreign investors in Brazil in farming activities, related services within the period of 2001 to 2009 were analyzed and its correlation to food security indexes were analyzed by Pearson correlation since the data were parametric. Agricultural foreign direct investment has shown an upward tendency during the analysed period, spiking in 2007 and declining in 2008 and 2009. When compared to the overall foreign direct investment inflow showed similar patterns around 2001 and 2009, presenting a strong positive correlation. When correlated to other variables, foreign direct investment presented insignificant association with the depth of the food deficit, but a positive moderated one when related to arable land and employment in agriculture, and a strong and positive correlation to the indexes consumers' price; food, crop and livestock productions. All social indexes, Brazilian population below the poverty line and rural population presented a negative strong correlation.

Key-words: Food security, Foreign ownership, Land acquisitions, Off-shore farming, Sovereignty.

1. INTRODUCTION

The spike in agricultural commodities prices in 2007/2008 was accompanied by a rise of farmland acquisitions by foreign direct investment (FDI). Some developing country have a growing interest in investment in food production abroad, which has contributed to this increase in FDI and other contractual arrangements in agricultural production (UNITED NATIONS, 2009). Some researchers and international institutions started to worry and inquire about food insecurity in the host countries. Nevertheless, through FDI, developing countries may gain access to markets, capital, and technology essential for development, increasing food security worldwide (MIHALACHE-O'KEEF AND LI, 2011).

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Foreign direct investment is relevant for its potential to transfer knowledge, create jobs, boost productivity, enhance competitiveness and entrepreneurship, and also eradicate poverty through economic development (UNITED NATIONS, 2002). On the other hand, FDI in agricultural production is said to reduce competitiveness of local farmers, lower economic growth and worsen life quality (JORGENSON *et al.,* 2007a).

The contrasting opinions led to a whole set of empirical studies and few concrete information based on real data. Regarding its effects on food security, agricultural foreign direct investment (AFDI) means different things to different people. Testing the arguments from those different points of view can assist the development of national policies and realistic strategies. Besides, understanding those factors is essential, since between 2000 and 2011, large-scale acquisitions increased by 203 million hectares globally (Anseeuw *et al.*, 2012) and is still lacking an overview of AFDI's impact (HÄBERLI, 2012c).

Although the scale of new investor and investment in agriculture by foreign investors it's not yet known, it is important to examine these trends because these investors represent a relatively source of investments for agricultural development (UNITED NATIONS, 2009). In Brazil, the agricultural foreign direct investment may contribute to a shift in the aim of food policies toward commodities of higher market value instead of the ones essential to local production which may threaten food security and of this society. Hence the aim of this paper is to analyse the effects of AFDI in Brazil.

2. BACKGROUND AND THEORIES

Although historically FDI has played an important role in agricultural production, after the Second World War, there was a decline in FDI flows to agriculture in developing host countries. This trend has been reversed in recent years, but some forms of foreign participation are causing concern in the development community (UNITED NATIONS, 2009).

Unlike previous food crises the latest one was linked to a rapidly increase in demand and competition between grains for human consumption and for feeding livestock and biofuel production, causing a broad price hike covering many food commodities (UNCTAD, 2008). The food crisis has triggered a number of responses, such as a growing concern about food security amid the further challenges posed by global warming, which is expected to affect food systems. Moreover, some food crop producing countries restricted the export, and food importing started investing in overseas (BROWN, 2008; BLANCHE, 2009), both constitute

elements of government policies for food security and agriculture's role in economic development (UNITED NATIONS, 2009).

This study intends to analyze the issue stated enlightened by the food security theory and the arguments regarding agricultural foreign direct investment. Food security is considered here, as in (FAO, 2002), as a situation when all people, at all times, have physical, social and economic access to sufficient, safe and nutritious food that meets their dietary needs and preferences for an active and healthy life. Foreign direct investment refers to an investment made to acquire lasting interest in an enterprise operating outside of the investors economy (UNCTAD, 2002).

The rise of new investor interested in agricultural production emerge for various reasons as: investor maybe be from countries which have not traditionally agro-invested overseas; or entrants into this industry, or non-transnational corporations actors, usually private equity or State-owned funds, sometimes especially established for this purpose targeting countries with abundance of resources scarce in the home countries (Figure 1).

Figure 1 – Investor, regions and countries in overseas land investment for agricultural production, 2006-2007[4]. Source: UNCTAD and United Nations (2009).

The drivers for the rise investors are threat and opportunity. For example, Agricapital (Bahrain) and Hadco (Saudi Arabia) are investing to support its governments' food security policies, while supplying food to the world, markets seen as a considerable opportunity

[4] Notes: this map covers only confirmed deals that have been signed, some of which have been implemented. However, not all signed deals have been implemented, and all signed deals that were rescind by one or both parties before the end of May 2009, are exclude. Prospective deals reported in the press, but which have not progressed to the stage of agreement are excluded. The total number of deal was 48, shown by both source and destination countries.

(UNITED NATIONS, 2009). When related to land acquisitions, and overall investments in food production this type of investment (Foreign) it is accused to threaten food security of the host country. Historically, two sets of arguments are presented (Figure 2).

	Argument	Authors
Modernization	• Global economic openness redirects factors of production to their most efficient use; consequently, growth-generating capital flows compensating for the savings deficit of developing countries. • Creates productivity gains and positive spill over effects inside developing host economies.	(Gilpin, 1987)
	• Positive relationship between foreign investment and caloric consumption (1965-1988) in 62 nations.	(Firebaugh and Beck, 1994)
	• International investments stimulate economic development and spread technological and operational innovations across national borders, increasing social welfare. • Foreign direct investment (1970-1975) does not reduce calories and grams of protein *per capita* in the early 1990s in a sample of 78 developing countries.	(Jenkins and Scanlan, 2001)
	• In agriculture the technology and know-how transfers that accompany foreign capital can be beneficial to local farmers.	(Dries and Swinnen, 2004)
	• Agricultural foreign direct investment creates direct, stable and long-lasting links between economies. • Encourages the transfer of technology and know-how between countries, and allows the host economy to promote its products more widely in international markets. • Foreign direct investment is a key element in international economic integration and is an additional source of funding for investment and can lead to development. • Developing economies tend to benefit from economic linkages with advanced economies. • Foreign direct investment in agriculture hinders the type of rural development the FAO and UNCTAD recommend for alleviating hunger.	(Lattimore and Kowalski, 2008; Mihalache-O'keef and Li, 2011)
	• Investors point out that their projects comprise roads, schools, hospitals, technology transfer and technical assistance.	(Häberli, 2012c)
	• Foreign direct investment will bring about substantially lower food prices when expanding agricultural land area, and thus increase national food security in host countries.	(Kappel *et al.*, 2012)
Dependency	• Foreign direct investment penetration reduces food security, measured by daily *per capita* consumptions of calories and protein averaged (1984-1986) in 59 developing countries.	(Wimberley and Bello, 1992)
	• Foreign direct investment inflows destruct local entrepreneurship, stifle technological innovation, crowd out domestic firms and increase unemployment.	(Rodrik, 1997)
	• Foreign direct investment in the production reduces competitiveness in other economic sectors. • The benefits of foreign direct investment rarely trickle down to the masses or are reinvested toward sustainable development. • Foreign direct investment contribute to lower economic growth and worse life quality, including lower food supply, higher infant mortality, inequality and pollution.	(Jorgenson *et al.*, 2007b)
	• Foreign direct investment promotes luxury goods markets that decrease consumer demand and because of their use of capital-intensive production in labour-surplus environments, multinationals cause unemployment and underemployment.	(Mihalache-O'keef and Li, 2011)
	• The benefits from foreign direct investment also tend to be concentrated and easily captured coercively by the elite at the national and regional levels.	(Häberli, 2012c)

Figure 2 - Modernization theory and dependency arguments related to foreign direct investment (FDI) and its effects in food security in the host country. **Source:** Elaborated by the authors.

Agriculture always stands as an important and socially sensitive industry in developing countries, it differs considerably from manufacturing industry and services

because it is vital to the provision of food, and, therefore to the alleviation of hunger and poverty, and is usually a major source of employment (Figure 3).

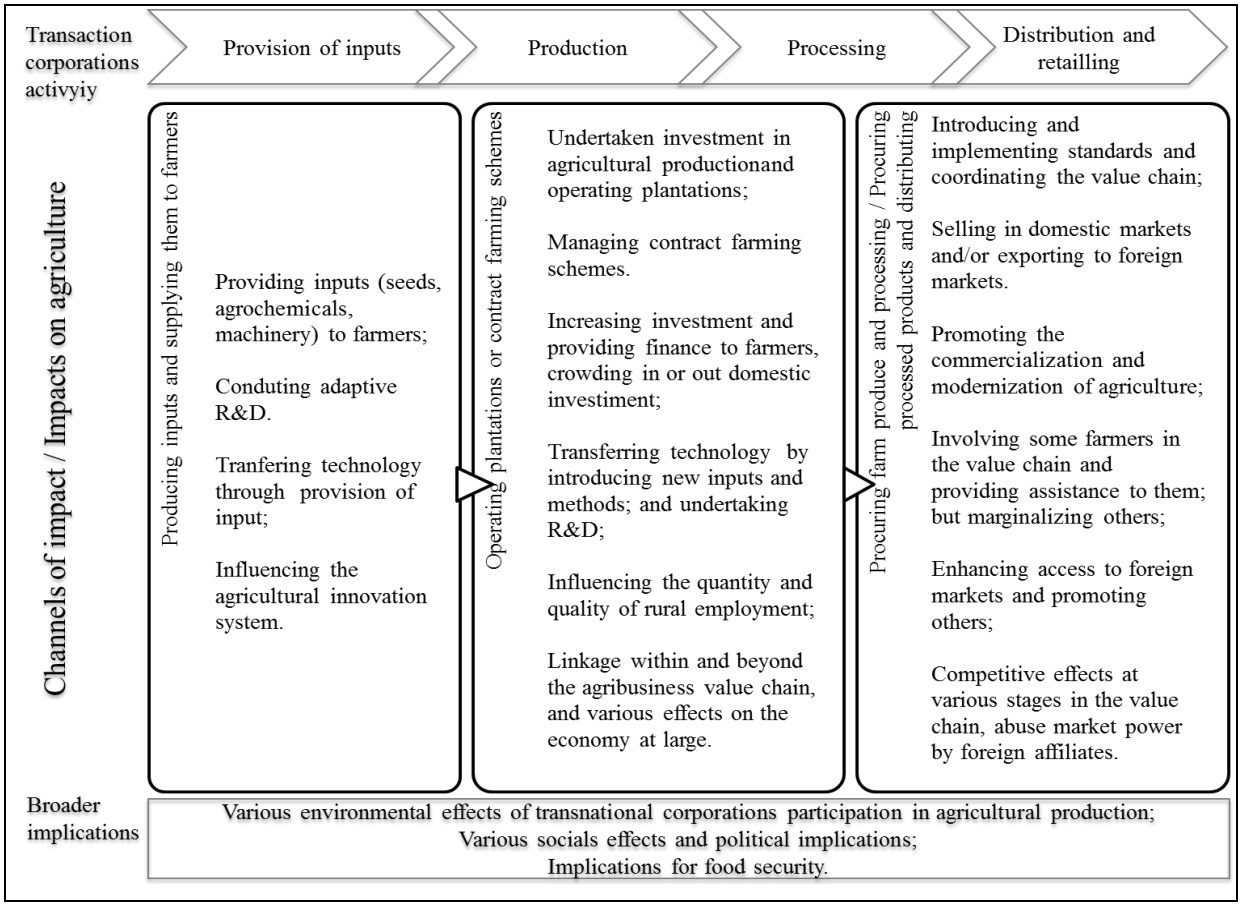

Figure 3 - Transnational corporations along agribusiness value chains and types of impact in host developing countries. **Source:** UNCTAD and United Nations (2009).

Though agricultural foreign investment (AFDI) is unevenly spread among and within countries, accounting for a very small share of inward FDI (in general, less than 1%) in some developing countries the share of AFDI in FDI exceeds this level by a substantial margin (United Nations, 2009), and deserves attention and research intent.

3. MATERIAL AND METHODS

Despite the lack of updated data, we searched for indexes related to food security according to others author (Figure 2 and 3). Therefore, three categories related to AFDI were established: food consumption, food production and social indexes (Table 1).

Table 1. Indexes related to the effects of agricultural foreign direct investments (AFDI) on food security.

Index	Source
Foreign direct investment (FDI)	
Agricultural FDI (U$S Millions)	Brazilian Central Bank
FDI Inflow (U$S Millions)	World Bank
Food consumption	
Consumer price index (2005 = 100)	World Bank
Depth of the food deficit (kilocalories per person per day)	World Bank
Food Price Index	World Bank
Food production	
Arable land (% of land area)	World Bank
Crop production index	World Bank
Food production index (2004-2006 = 100)	World Bank
Livestock production index (2004-2006 = 100)	World Bank
Social indexes	
Brazilian population living below the poverty line (% in 1991-2007)	DIAP
Employment in agriculture (% of total employment)	World Bank
Rural population (% of total population)	World Bank

Source: Elaborated by the authors

Since there is a lack of available data related directly to land acquisitions by foreign investors in Brazil, as stated by (WILKINSON *ET AL.*, 2012) FDI in farming activities and related services were used within the period of 2001 to 2009.

These data were organized into worksheets of Microsoft Excel 2010® and then analyzed by Biostat 5.3 (AYRES *et al.*, 2007), considering a significance level (p) of 0.05. Since data were parametric, *Pearson* correlation was the statistical test used.

4. RESULTS AND DISCUSSION

Agricultural foreign direct investment shown an upward tendency during the analysed period, it spikes in 2007 and then declines in 2008 and 2009. When compared to the overall FDI inflow showed similar patterns around 2001 and 2009 (Figure 4).

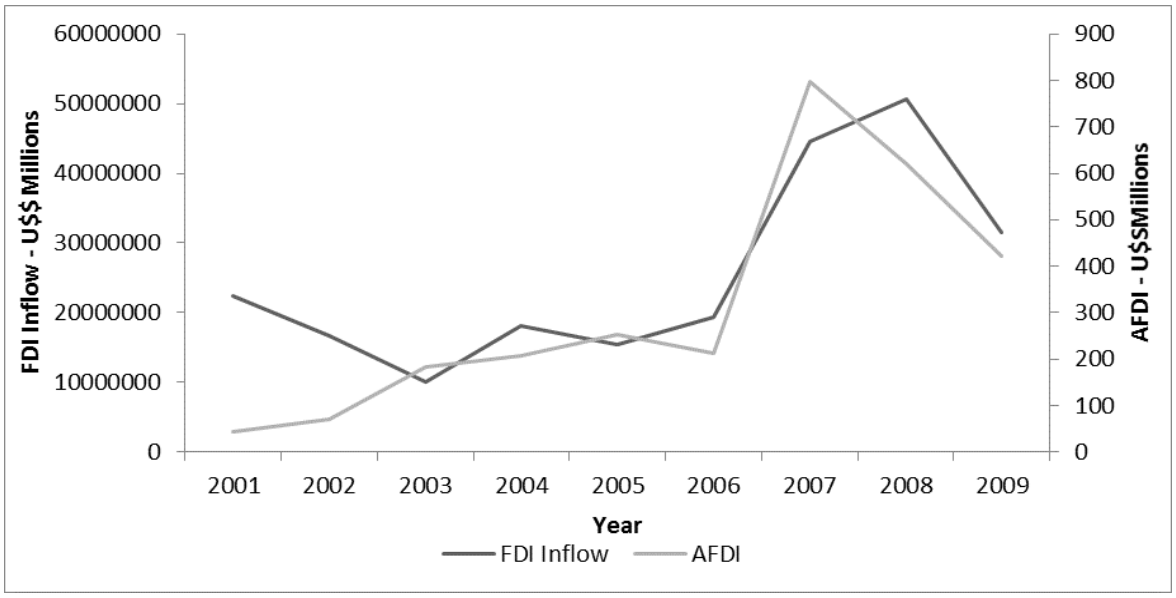

Figure 4. Agricultural foreign direct investment (AFDI) and foreign direct investment (FDI) inflow in Brazil.

Statistical evidence of the FDI effects on food security is limited and often mixed (MIHALACHE-O'KEEF AND LI, 2011). Other researches (HÄBERLI, 2012a; 2012b) argued that international legal framework applied to food security and FDI also demonstrates fragmented rules, so we hope these results may contribute to unite these arguments under a constructive unbiased point of view.

According to our findings, the AFDI in Brazil presented a high and positive correlation to the overall FDI inflow, which may represent a general investment interest in a relative solid Nation, since private entrepreneurs prioritize the economic and technical feasibility of an agricultural investment project (WILKINSON *et al.*, 2012; HÄBERLI, 2012c) and Brazil offers both. This could be for strategic reasons, as to ensure the supply of agricultural products for a growing populations and industries; and new factors as securing feed stock for new industries such as biofuels and feedlots (UNITED NATIONS, 2009).

Even special places with amazing and profitable natural resources that offers so many food and fuel alternatives and productivity, such as Brazil, has regions facing hunger, malnutrition and people living under severe poverty. Though, the average *per capita* calorie availability in this country grew steadily over the last three decades at an annual rate of 0.7 percentage (FAO, 2009), due to the highly skewed income distribution, the lowest-income population segments are consumes less than their basic nutritional requirements (Meade *et al.*, 2004). One of the aspects related to meeting these requirements is the access to food, attended by the financial capacity to buy food.

This concern is aggravated in developing countries that suffer from an agricultural investment gap, these countries face difficulties in meeting objectives as halving hunger and poverty by 2015 (UNITED NATIONS, 2009), as proposed by the Millennium Development Goals (SACHS, 2005). According to FAO, an extra $30 billion per year needs to be invested in agriculture to ensure that those targets are met (FAO, 2008).

When correlated to other variables AFDI presented insignificant association with the Depth of the food deficit. Among the variables with significant correlation arable land and employment in agriculture had a moderate correlation, while the other presented a strong correlation. All Social indexes presented negative correlation (Table 2).

Table 2. Correlation between foreign direct investment and food security indicators.

Variables	Agricultural FDI ((*p value*)	
FDI INFLOW	**0.87**	**0.0022**
Food consumption		
Consumer price index	**0.77**	**0.0157**
Depth of the food deficit	0.24	0.5289
Food Price Index	**0.86**	**0.0029**
Food production		
Arable land	**0.70**	**0.0371**
Crop production index	**0.84**	**0.004**
Food production index	**0.83**	**0.0056**
Livestock production index	**0.80**	**0.0096**
Social indexes		
Brazilian population below the poverty line	**-0.75**	**0.0498**
Employment in agriculture	**-0.67**	**0.0496**
Rural population	**-0.79**	**0.0106**

Source: Elaborated by the authors according to data from the World Bank (2007) and Brazilian Central Bank and DIAP (DIAP, 2010). Bold values indicate a significant correlation.

Although, positive correlated to AFDI, consumer's price index is hardly affected by it more than it is influenced by the rise in the commodities price crises over the world. Nevertheless, it's an important aspect to take into account when establishing Brazilian legislations since access to food is directly related to its price. Another interesting aspect is the uncorrelated depth of food deficit that may be influenced by the series of food policies established by Brazilian government dedicated to halving hunger.

If each country have an obligation regarding the worldwide food security issues, Brazil and the other potential countries may have to play this AFDI game to sustain and

achieve the productivity level necessary for feeding the upcoming world population and to economically benefit from it. However, the encouragement of these investments and the protection of this contracts indicate a lack of government coherence (Häberli, 2012c) in addition to the protection and compensation almost exclusively aimed to the investor lacking substantial benefits for its host country.

Moreover, as discussed in Jorgenson *et al.* (2007b), special attention should be given to the fact that it is not indicated to highlight responsibilities without excluding the relationship of social dimension with FDI. Our results point to an inverse association between the AFDI and social indices, which could indicate a related downside to FDI.

Being as it may, arable land had a strong positive correlation to AFDI, which may be related to technological and know-how transfer and is also seen in the increasing in livestock, crop and general food production index. Obviously, the technological capacity of Brazilians to increase their production indexes can't be discarded, but that also may be increased by AFDI spillovers. Nevertheless, many governments and local authorities are wary of foreigners telling them how to manage their natural resources.

The productivity boost in Brazilian agriculture also improved when compared to other countries (Table 3) even developing countries that in general also received AFDI. That may lead to different interpretations: it may be that agriculture productivity in host countries has nothing to do with AFDI or it respond in different ways in each region and its juncture. But, we cannot close our eyes to the fact that AFDI brings new technologies for production and processing, and increase yields and productivity in the whole sector (HÄBERLI, 2012c), and therefore may have contributed to this growth.

Table 3. Total productivity growth in agriculture.

	Average annual growth rate				
	1961-1970	1971-1980	1981-1990	1991-2000	2001-2009
All developed countries	0.99	1.64	1.36	2.23	2.44
All developing countries	0.69	0.93	1.12	2.22	2.21
Brazil	0.19	0.53	3.02	2.61	4.04

Source: Fuglie (2012).

All social aspects evaluated have shown a strong negative correlation to AFDI. This correlation to the percentage of the Brazilian population living below the poverty line may not state that AFDI is saving people from poverty, but it is for sure not making it worse. On the other hand, local populations can be better off with AFDI if their government has the

necessary negotiating capacity and willingness to do so and other sources of income are equally available at a sufficient level (DESSY *et al.*, 2011).

Agriculture employment and rural population also had a negative strong correlation to AFDI, indicating that even if these investments are jeopardizing local job stability, it is compensated by other factors such as local development and consequent employment generation. Furthermore, it's know that AFDI unconsciously may create new jobs, including for the former landowners (HÄBERLI, 2012c).

None of the factors related to food insecurity at the household and community levels, such as low productivity of crop and livestock, and limited or insufficient access to food because of extreme poverty (European Commission, 2010) are in place in Brazilian context.

Nevertheless, other questions had to be considered as the preservation of the knowledge, priorities and aspirations of small-scale producers, and they are rarely included in policy debates (EDELMAN, 2003). Indeed, food sovereignty is a major concern to be put on the table in this discussion, as it is related to the right of people to achieve healthy and culturally appropriate food produced through ecologically sound and sustainable methods and the right to define their own food and agricultural system (SWAC, 2006).

5. FINAL CONSIDERATIONS

This research offers a contribution to this discussion by associating these investments to its social and economic effects. As was expected, we found that in Brazil there is a positive relation between FDI and AFDI a result that should be analyzed in other countries for a global understanding the future scenario and the fundamental items to be considered in a worldwide regulation for those investment.

Analyzing these data it is clear that investments made in Brazil has an important to role socioeconomic development of the country and to solve problems related to food insecurity. However, care must be taken with the results of these investments in the social dimension. The most concerning result is the strong and negative correlation of the AFDI to the social indexes, which may have many others drivers and reasons to follow that pattern, but the negative effects are there and should be further analysed.

Among the many limitations of an overall understanding of the effects and drivers of AFDI and FDI in general is the fact that it was not possible to control all variables due to the

absence of data. Moreover, our inference is associative and cant not established a causal relationship based on the information of this paper.

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