THE AGRICULTURAL EXPORT-GROWTH NEXUS IN THE EU-27 AND THE COUNTRY RISK

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ABSTRACT

The EU agriculture is undergoing an important process of liberalization and global integration within which its growth is a key issue particularly in view of the targets of competitiveness and convergence set by the Community. In this context, the paper, focusing on the EU-27 and the time period 2000-04, analyses the agricultural export-growth nexus and the role of the country risk, aspect that is still lacking in the empirical literature.

KEYWORDS: agricultural growth, agricultural openness, country risk.

1. INTRODUCTION

The EU agriculture is undergoing an important process of liberalization and global integration. In the old Member States the sector is facing the Mid Term Review while the Eastern Countries are adapting themselves to the market rules and regulations. The process is taking place in an environment that is witnessing the most remarkable institutional harmonization and economic integration among nations in world history and that, since the 1990s following the collapse of communism, has opened to the emerging of a dominant global economic system. Most programs of the eastern Countries have been the integration of the national economy with the world economy with trade liberalization one of the measures (SACHS, WARNER, 1995).

In this context, agricultural growth becomes one of the key issues particularly in view of the targets of convergence and competitiveness set by the Community. The aspect is traditionally analysed with respect to the regional level (NUTS2), where data constraints often represent a serious limitation. One of the missing aspects is the implication of exports on growth due to the unavailability of specific trade indicators.

Even if theoretical positions on the export-growth nexus can be very divergent, the empirical studies seems to have supported the standard positions of the neoclassical type suggesting that the good export performance and outward orientation should make major contributions to economic growth (BALASSA, 1978,1985; CHENERY, 1979; RAM, 1987; MICHAELY, 1977, GYLFASON, 1999a).

According to the literature exports affect growth mainly by:

- Increasing specialization and expanding the efficiency-raising benefits of comparative advantage;

- Offering greater economies of scale due to an enlargement of the effective market size;

- Affording greater capacity utilization; and

- Inducing more rapid technological change (Gylfason, 1999b).

A recent analysis has shown that accession has intensified agricultural trade in both old and new Member Stats without diverting trade from third countries. In addition, exports performance in high-value processed products has improved as a likely result of the restructuring process of food processing industry in the new Member States (BUREAU OF EUROPEAN POLICY ADVISERS, DIRECTORATE-GENERAL FOR ECONOMIC AND FINANCIAL AFFAIRS, 2006). In this context, the lacking aspect refers to the implications of these tendencies on agricultural growth.

The paper faces this issue. Its goal is the understanding of the openness degree of the agricultural sector in the EU-27 and its implication on the differential of agricultural labour productivity at the country level, that is the lowest territorial level at which agricultural export

data is available. The preliminary analysis provided by the paper is based on a cross-country data from EUROSTAT, during the time period 2000/2004, with t-test and F-test used to determine the statistical significance of the empirical regularities observed. The regression line is only intended to allow the raw data to provide a rough impression of the pattern that would be expected to emerge in the absence of any other influences on agricultural productivity and on the openness degree. As these two variables are endogenous, a conclusive demonstration of the relationship estimated would consider other explanatory variables that exert an exogenous influence on them. In this respect, not only tariff protection is relevant but also the country risk that relates to the political, economic, or financial instability of a country. It determines the likelihood that changes in the business environment will occur reducing the profitability of doing business in that country and, thus, carries additional risk not present in domestic transactions (MELDRUM, 1999). Although the key role of this component of the business transaction across international borders, the empirical literature on the topic is still lacking. For this reason, the paper analyses the impact of these typologies of risk on the export-growth nexus on the basis of the International Country Risk Guide (ICRG) data for 2000-2004, provided by The Political Risk Service (PRS) Group. More precisely, the empirical analysis has been structured as followed:

- The ratio of agricultural exports to the sector value added, adjusted by the country size, has been regressed on its main hypothesized determinants across countries;

- The 2000-2004 average growth of the real agricultural productivity has been regressed on the determinants of export performance.

2. OPENNESS INDEX

The ratio of agricultural exports to agricultural value added has been adopted as first indicator of openness to external trade. Its 2000/04 average value across the countries of the sample ranges from 2.19% of Greece to 79.47% of Latvia (Figure 1).

Classifying the countries according to their size[1], it should be noticed that the inverse relationship between exports and the country size suggested by the literature is confirmed (GYLFASON, 1999b). Large countries are less dependent on agricultural foreign trade than smaller ones: internal exchange tends to replace external trade in larger countries (Figure 2).

This is also true for the change over time (Table 1).

The relationship pointed out has suggested making reference to a more accurate index of openness unaffected by the size of population in order to estimate a significant explanatory variable particularly in the regression that explains the agricultural growth. Following GYLFSON (1999a) the index has been calculated as follows.

Figure 1: Average Agricultural Exports in percent of Agricultural Value Added by EU-27 countries in order of population size – 2000/04 (%)

[1] The classification adopted reflects the criteria introduced by Gylfason (1999a) and according to which a small country has less than 2.000 million people, a medium between 2.000 and 20.000 millions and large more than 20.000 millions.

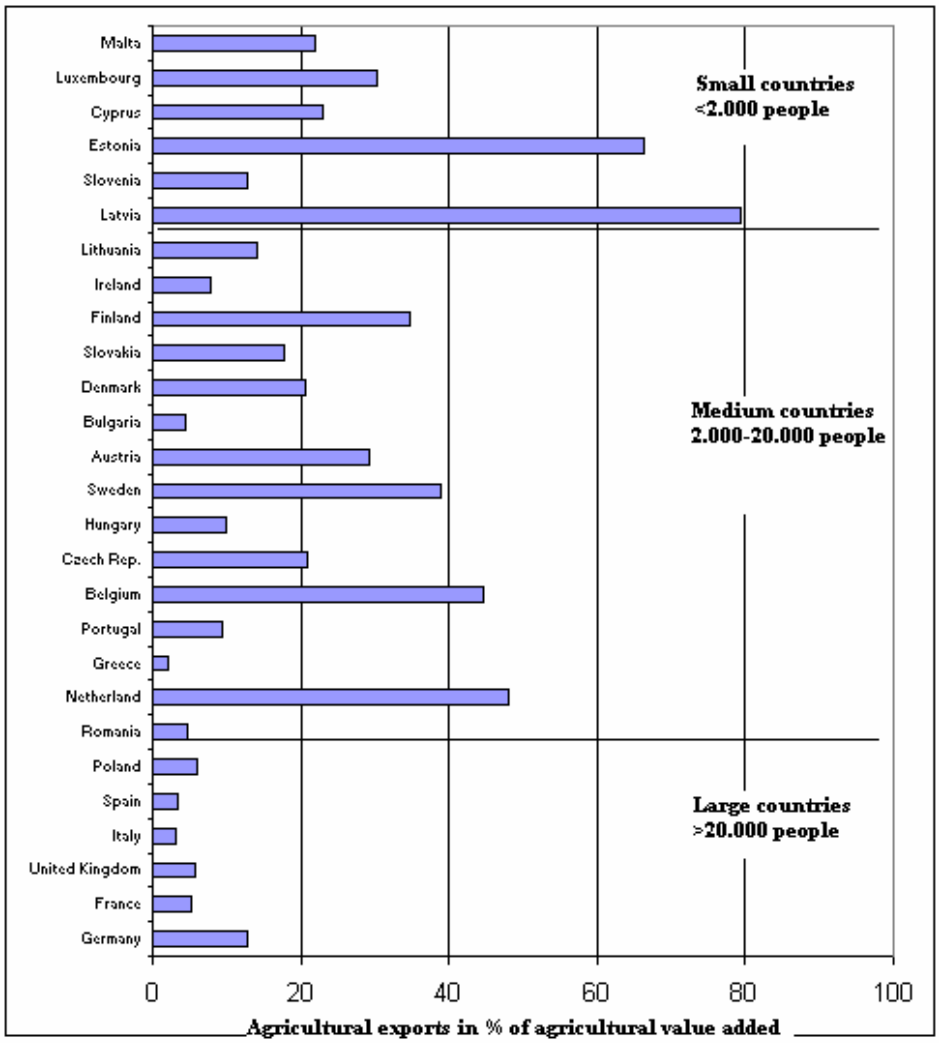


Figure 2: Agricultural export ratio and population

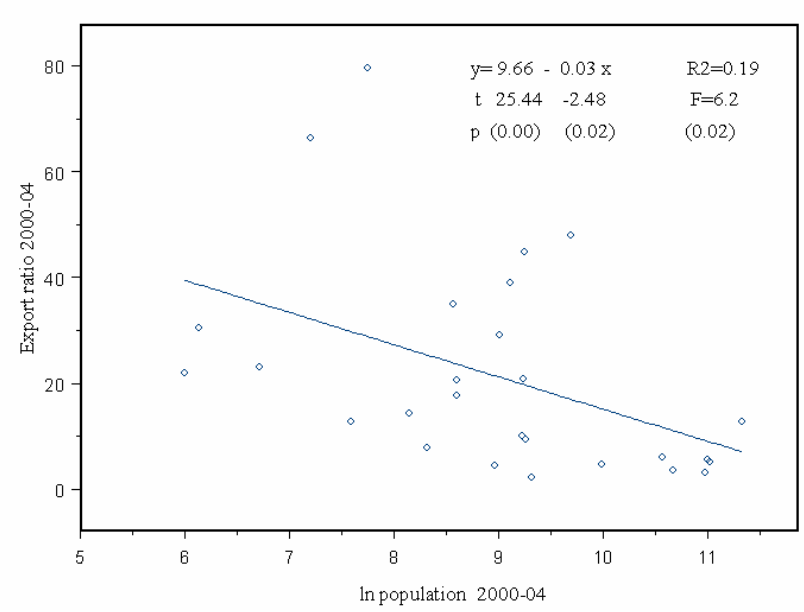


Table 1: Average Agricultural Exports in percent of Agricultural Value Added by sub-group of countries according to the population size and % change – 1990/94 - 2000/04

	2000-04	% change 1990/04-2000/04
Small	38.97	1446.48
Medium	20.49	116.85
Large	5.99	59.02

First, the elasticity of the agricultural export ratio ($\frac{X_A}{AVA}$) to population (*pop*) for the whole sample on 2003 has been estimated through a cross-county regression, with the OLS method, according to the following equation:

$$\frac{X_A}{AVA} = \alpha + \beta \ln(pop) + \mu \quad (1)$$

By substituting for each country the population size, a predicted agricultural export ratio has been calculated. It has been subtracted from the actual export ratio finding a measure of openness adjusted by the population size. According to this indicator the country in the sample can be classified into two subgroups:

- Open countries, with an adjusted openness index greater than the average value and that includes Belgium, Germany, Luxembourg, Netherlands, Austria, Finland, Sweden, Estonia, Latvia, and Czech Republic;
- Closed countries, with a weighted index lower than the average and that comprises France, Italy, Denmark, Ireland, United Kingdom, Greece, Portugal, Spain, Cyprus, Lithuania, Malta, Poland, Slovakia, Slovenia, Hungary, Bulgaria, Romania.

The gap between the two classes is wide, approximately 50% above and below the average respectively, suggesting the absence of countries with an agricultural sector characterised by an adjusted openness degree close to the average value.

3. OPENNESS AND AGRICULTURAL PRODUCTIVITY

Figure 3 illustrates the agricultural export[2]-growth nexus across the countries of the sample showing that the sector labour productivity does not seem significantly correlated to the pattern of agricultural exports and population. However, the graphic representation has suggested to exclude by the sample Latvia, Estonia and Malta as outliers. The former two has the highest agricultural adjusted openness and a low sector productivity, while the latter the lowest openness degree and an above average agricultural productivity.

Referring to the restricted sample made of 24 EU countries, the correlation between weighted agricultural openness and labour productivity is positive and statistically significant (Figure 4).

Furthermore, there is a clear separation between the new and old Member States, with the former characterised by the lowest agricultural productivity levels and all in the sub-group of the closed economy, a part from the Czech Republic. Another exception is Slovenia with the highest agricultural productivity and a very low weighted openness.

Figure 3: Weighted agricultural openness and agricultural productivity in 27 EU countries

[2] As suggested by the literature, a lag of one year in the impact of openness on agricultural productivity has been adopted. Thus, the agricultural exports ratio makes reference to 2003.

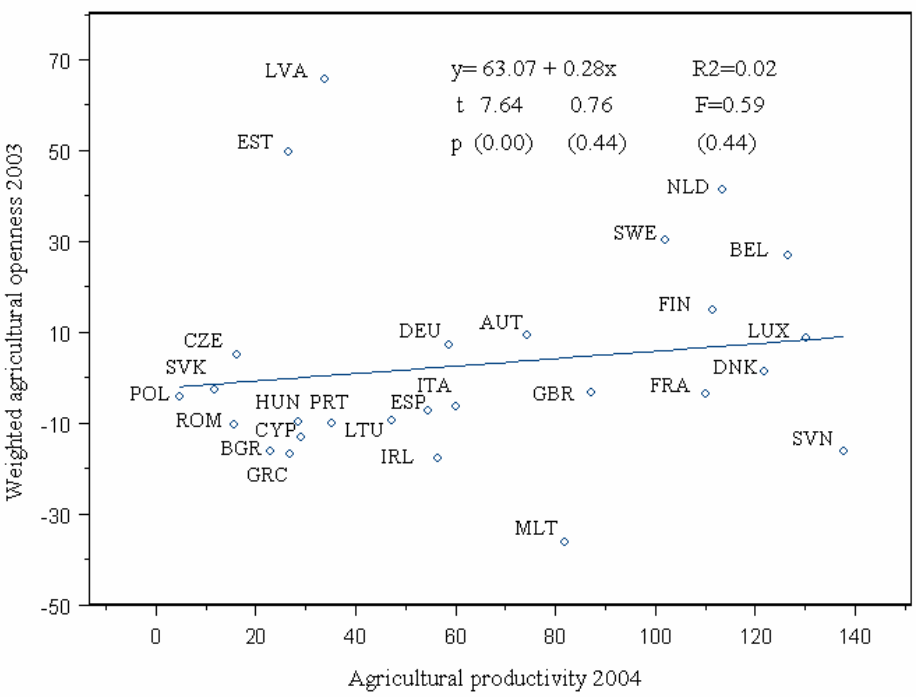
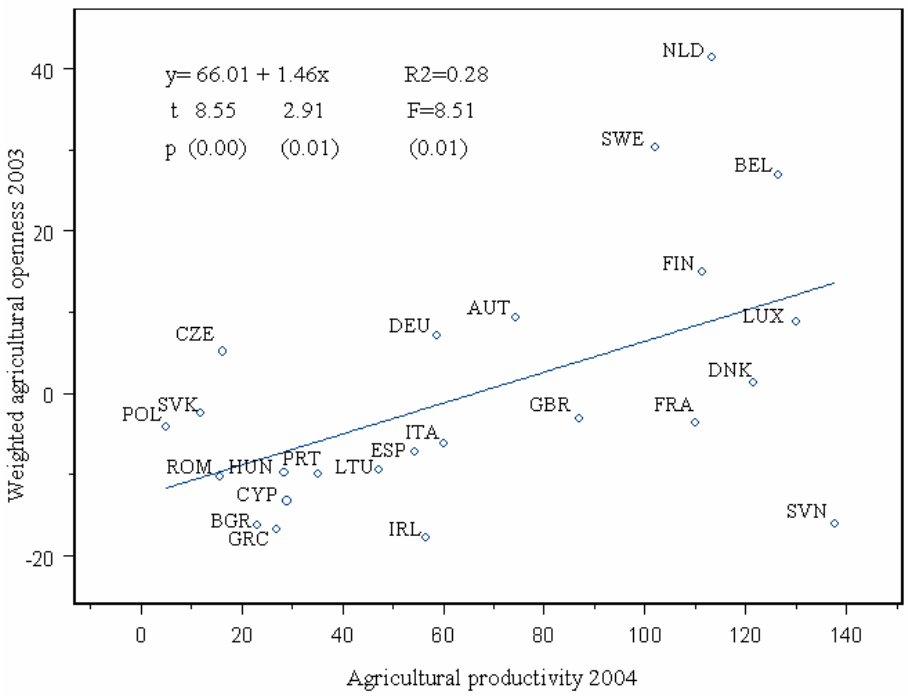


Figure 4 - Weighted agricultural openness and agricultural productivity in 24 EU Countries



4. OPENNESS AND COUNTRY RISK

The relationship between agricultural openness and the country risk has been first assessed through the political, financial and economic risk indexes provided by The PRS Group[3]. The political risk index gauges the political stability of a country at a specific time. Its rating is based on points, which are assigned to 12 weighted variables, that is government stability, socio-economic conditions, investment profile, internal and external conflict, corruption, military in politics, religious tensions law and order, ethnic tensions, democratic accountability and bureaucracy quality. Beginning with TINBERGEN (1962) the literature pointed to political risk as an important impediment to international trade because it represents an additional transaction cost.

The financial risk index is a measure of a country's ability to finance its official, commercial and trade debt obligations. It consists of the following 5 weighted components: foreign debt as a percentage of GDP, foreign debt service as a percentage of exports of goods and services, current account as a percentage of exports of goods and services, net international liquidity as months of import cover and exchange rate stability.

The economic risk index assesses a country's current economic strength and weaknesses and is made up of 5 weighted variables, that is GDP per head, real GDP growth, annual inflation rate, budget balance as a percentage of GDP and current account as a percentage of GDP.

For the all the three indexes, the lower the risk point total, the higher the risk and *vice versa*.

According to Figure 5, 6 and 7, a low the political, economic and financial risk is positively and statistically significantly correlated to the weighted agricultural openness. The success of the regressions in predicting the values of the dependent variables, measured by the R2, is relatively highest when the economic risk index is considered (40%), followed by the financial (30%) and political (20%) risk

Figure 5: Weighted agricultural openness and political risk

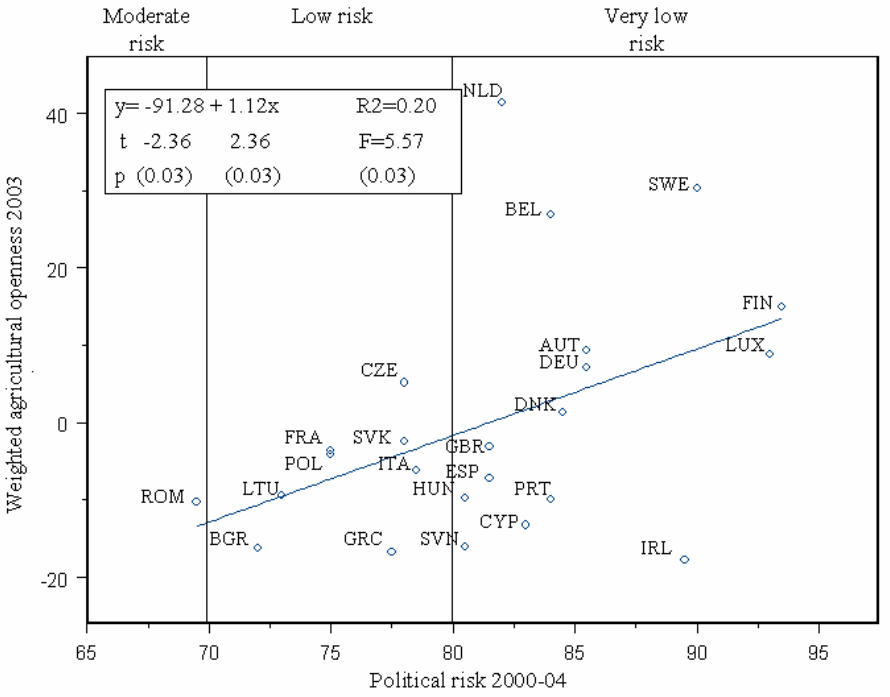


Figure 6: Weighted agricultural openness and financial risk

[3] The reference to ICRG is based on the fact that the ratings provided are adopted by some 80% of the world's largest companies, as well as aid donors and international financial institutions.

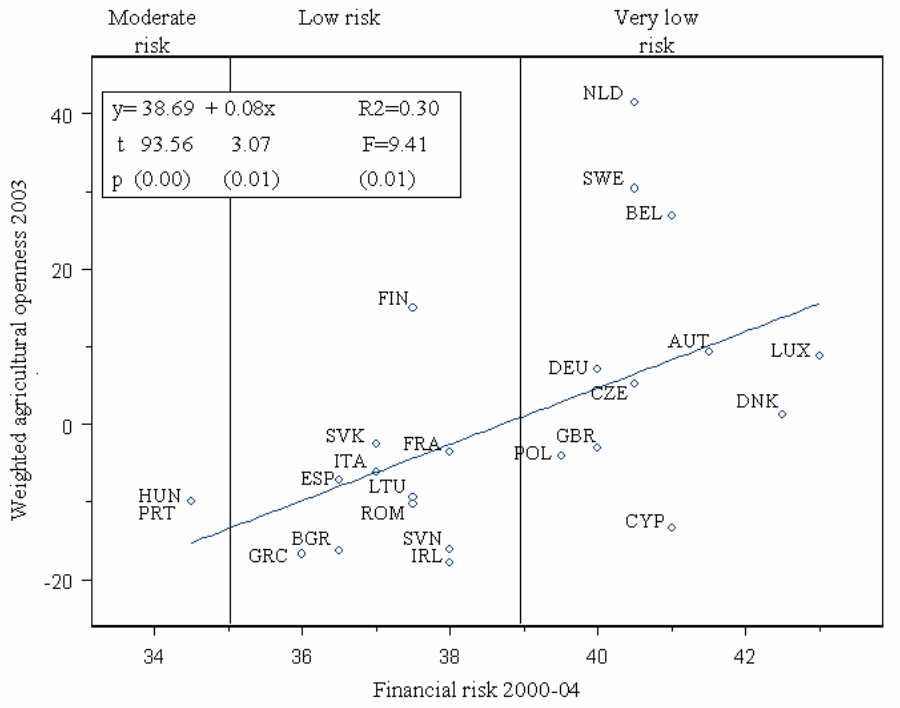
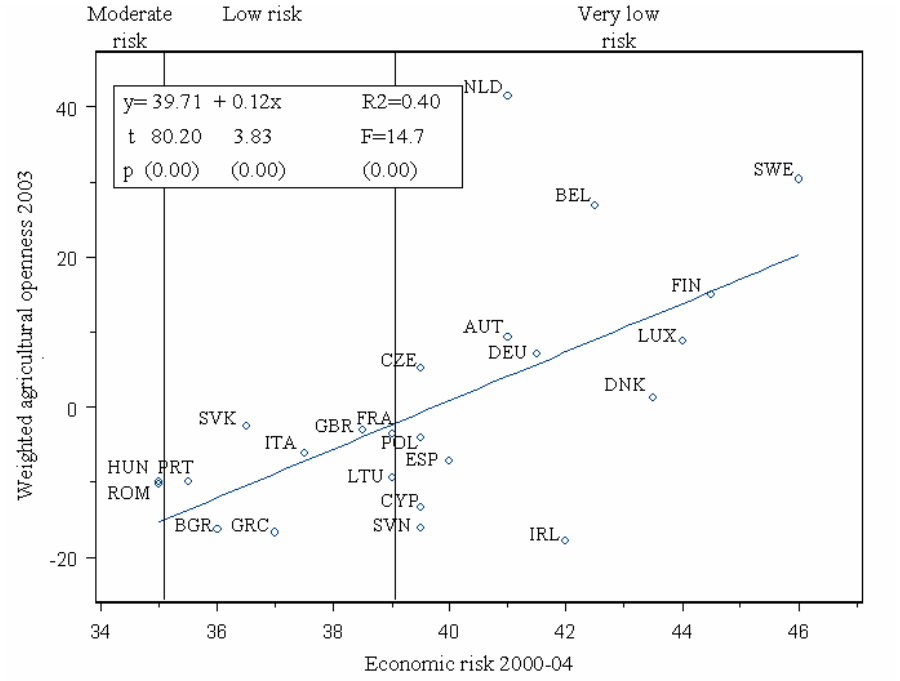


Figure 7: Weighted agricultural openness and economic risk



The graphic representation has allowed distinguishing the countries according to the intensity of the specific risks. The classification has been based on the criteria suggested by the PRS Group and according to which the sample for each index can be split into three classes: moderate, low and very low risk. The majority of the observations are in the very low risk class while only very few of them are in the moderate risk sub-group. The former not only includes the old Member States but also certain new entrant such as Hungary, Cyprus, Poland, Slovenia and the Czech Republic. Combining these information with those referred to the agricultural productivity certain common dynamics emerge. They concerns:

- Netherlands, Sweden, Belgium, Luxembourg and Denmark that are characterised by above average level of agricultural productivity, a very low country risk and the highest agricultural openness;

- Germany and Austria with an average agricultural productivity, a very low country risk and the highest agricultural openness;

- Spain and Ireland that have an average agricultural productivity, a low financial risk, a very low political and economic risk and a low weighted agricultural openness;

- Greece, Bulgaria and Lithuania with a below average agricultural productivity, a low country risk and a low openness degree;

- The Czech Republic and Poland that have a below average agricultural productivity, a low political risk, a very low financial and economic risk and a low openness.

The majority of the countries in each group share the borders suggesting a likely influence of the intra-country trade, aspect that should be better understood.

5. DETERMINANTS OF THE AGRICULTURAL LABOUR PRODUCTIVITY

In order to understand the role of agricultural openness on the sector growth, the following equation has been estimated:

$$\Delta \frac{AVA_i}{AL_i} = \alpha + \beta \Psi_i + \delta \Gamma_i + \gamma \Theta_i + \varphi \Omega_i + \mu_i \qquad 2$$

where $\Delta \frac{AVA_i}{AL_i}$ is the 2000-04 annual average growth of the agricultural labour productivity, Ψ_i is the vector of the political risk components, Γ_i that of the financial risk determinants and Θ_i of the economic risk variables, all of country *i* and referred to the 2000-04 average values, Ω_i is the control variable of the influence of the business cycle represented by the level of agricultural productivity in 2000 and μ_i is the error term. A step-wise model selection has been adopted for choosing the best model that is illustrated in Table 2.

Table 2: Dependent variable annual change Agricultural labour productivity (2000-04)*

Variable	Coefficient value	t value	Pr(>|t|)
Intercept	39.80	2.87	0.0094
Annual inflation rate risk index	1.35	2.71	0.0134
Real GDP growth risk index	-1.16	-2.85	0.0100
Budget balance risk index	0.66	2.19	0.0406
Current account risk index	0.51	2.98	0.0075
Socio-economic risk index	-1.36	-2.70	0.0141
Investment profile risk index	3.22	2.91	0.0089
Corruption risk index	-1.45	-1.73	0.0987
F-statistic	8.54		0.00009
R^2	0.7589		

* OLS method

All the explanatory variables have an estimated coefficient with a marginal significance level less then 5%, a part from the Corruption risk index. The fraction of the variance of the dependent variable explained by the independent variables is pretty high, almost 76%, and the F-test is highly significant.

Concerning the independent variables, four of them are components of the economic risk index (Annual inflation rate risk index [4], Real GDP growth risk index[5], Budget balance risk index[6] and Current account risk index[7]) while the others concern the political risk index (Socio economic conditions risk index[8], Investment profile risk index[9] and Corruption risk index[10]).

Low risk of inflation, budget deficit, current account deficit and deterioration in investment environment have all resulted correlated with high level of agricultural productivity growth and *vice versa*. On the contrary, low risk of low (high) development rate and of deterioration in socio-economic conditions seems to affect negatively (positively) the agricultural productivity growth.

The relationship between inflation and growth remains a controversial issue in both theoretical and empirical literature with structuralists and monetarists on opposite positions (HOSSAIN, CHOWDHURY, 1996; BRUNO, 1996). Three possible results have been underlined. They are: i) Inflation with development, the so-called Tobin effect (TOBIN, 1965); ii) Inflation without development, or the anti-Tobin effect (FISHER, 1993; BARRO, 1996; BRUNO, EASTERLY, 1998); iii) Inflation with neutral impact on development (SIDRUSKI, 1967). In this context, the analysis developed suggests that price stability should be a prerequisite for the agricultural productivity growth. The literature underlines several possible pathways of the interaction between inflation and growth, for example through real exchange rate, production, saving and investment and structural conditions, whose positive effects seems also to affect agricultural productivity growth, relationship that deserves further investigation to be better understood.

The size of Government expenditure and its impact on growth has been analysed for decades and has represented a major public choice issue facing economies in transition. However, the literature, essentially of empirical nature, is controversial. On the one side, there are those supporting the pro-market view according to which an increase in government expenditure constraints economic efficiency, productivity and overall growth (BARRO, 1991; LANDAU, 1983, 1986; GHALI, 1998). Several arguments are produced to support this view. Among them, there are the fact that the public sector is not responsive to market signals and the possible crowding-out effect on private investment. In this respect, the empirical findings pointed out seem to confirm this position. However, it should be noted that the result might also be connected to the low quality and allocation issues of the public expenditure that

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[4] The risk index of the Annual inflation rate is estimated making reference to the unweighted average of the Consumer Price Index calculated as a percent change and can be understood as a proxy of the monetary policy.

[5] The estimation of Real GDP growth risk index is based on the annual change in the estimated GDP, at constant prices, of a given country expressed as a percentage increase or decrease.

[6] The Budget balance risk index is estimated on the basis of the general government budget balance (excluding grants) for a given year in the national currency as a percentage of the estimated GDP for that year in the national currency. It is a proxy of the fiscal policy and its importance also lies on the fact that it affects long term investment.

[7] The Current account risk index is estimated considering the balance on the current account of the balance of payments for a given year, converted into US dollars at the average exchange rate for that year, expressed as a percentage of the estimated GDP of the country concerned, converted into US dollars at the average rate of exchange for the period covered.

[8] The Socio economic conditions risk index assesses the socio economic pressures, which could constrain government action or fuel social discontent and expresses the political stability of a country.

[9] The Investment profile risk index assesses factors affecting the risk to invest that are not covered by other political, economic and financial risk components.

[10] Corruption is the threat to invest through its ability to distort the economic and financial environment, and reduce the efficiency of government business and as it introduces an inherent instability into the political process and is a proxy of the political effectiveness.

should undermine the implications suggested by the macroeconomists, particularly the Keynesian. This school of though support the view that government spending accelerates economic growth due to several reasons among which the provision of basic good and services for development otherwise not provided by the private sector and necessary to overcome constraints to growth and, particularly, to support a better allocation of resources (CHENERY, SYRQUIN, 1975; RAM, 1986; ASCHAUER, 1989). As the transition countries, the literature suggests a specific role Government that through adjustment and stabilization programmes can face the vulnerability to external shocks and trade dependency (DOUGLAS, WILLIAMS, 1997).

Concerning the current account balance, although a deficit does not mean necessarily that a country is weak, the literature underlines that its reversal represents a significant damage for the economy due to its often negative impact on economic performance (see, for example, CALVO, 1988, 2000; MORENO, 1999; BARRO, 2001; EDWARDS, 2001). It is signal of potential imbalances that could lead a country to restrict certain typologies of foreign capital flows that cannot be substituted by domestic capital or generated domestically by increasing savings. Interpreting the risk of current account deficit as a signal of this tendency, the results achieved seem to support this view.

The strongly developed theoretical and empirical body on the relationship between investment, productivity and long-term economic growth find its foundation into two basic schools of though: the neoclassical referred to the pioneer approach by SOLOW (1956) and the new growth theory, or endogenous theory, first articulated by ARROW (1962), ROMER (1986) and LUCAS (1988). The neoclassical view first focuses on accumulation in tangible assets and then included investment in human capital, research and development and public infrastructure, whose benefits are internal in the form of enhanced productivity or wages. The new growth theory, on the other side, emphasises the role of those investment that creates externalities and generate additional productivity boost through production spillovers or associated diffusion of technology (FAIRHOLM, 2004). Even tough differences between these schools of tough have significant implications on the mechanisms that determine the impact of investment on productivity and economic growth, they both emphasise the positive impact of investment on growth (for a review see, for example, STIROH, 2000), relationship confirmed by the empirical findings of the analysis developed.

The results achieved have also supported the tendency for the level of development and socio-economic conditions to be inversely correlated to agricultural productivity through the impact on agricultural output (CHENERY, ROBINSON, SYRQUIN, 1986).

6. CONCLUSIONS

The analysis has confirmed the positive nexus between the agricultural productivity level and the weighted sector openness. This latter variable has resulted significantly affected by the country risk and particularly by the economic environment providing new insights towards a better understanding of the factors affecting agricultural growth that is today understood as one of the most pressing issue in the enlarged EU.

Regressing the agricultural productivity on the single determinants of the export performance related to the country risk, the results are broadly consistent with the literature and open new grounds on how to proceed in exploring the topic.

A further investigation on the possible pathways through which the components of the country risk affects agricultural productivity has emerged as a priority particularly from a policy point of view. Furthermore, a conclusive demonstration of the relationships pointed out would required a more detailed econometric scrutiny not only in terms of methodologies

adopted (through, for example, panel data and dynamic methods) but also of other relevant variables, particularly of political nature.

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