STUDIA UNIVERSITATIS
BABEŞ-BOLYAI

OECONOMICA

1/2010

VOLUME 55 **2010**

STUDIA
UNIVERSITATIS BABEŞ-BOLYAI
OECONOMICA
1

EDITORIAL OFFICE OF OECONOMICA:
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ECONOMIC IMPACTS OF BRAZILIAN INDIRECT TAX REDUCTION: AN ANALYSIS OF THE COMPETITIVENESS WITHIN MERCOEURO

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Abstract. The objective of this paper is to determine the effects of the creation of MERCOEURO stemming from an indirect tax reduction in the Brazilian economy. Four different scenarios were analyzed taking into account the elimination of tariffs on imports among the member countries in the MERCOEURO agreement and a 10% reduction in the indirect taxes on the final consumption, on intermediary inputs, and on sectors production. Simulations are run using *GTAPinGAMS* with the GTAP database version 6.0. The creation of the MERCOEURO generated significant results mainly in the agribusiness sector. A reduction in the indirect taxes on final consumption and over the intermediate inputs improve the competition and generate gains in growth, welfare, and government revenue. However, the scenario that reduces the indirect taxes on the Brazilian sectors production cannot increase competition, even though there are positive changes in indicators of growth and welfare. The scenarios generate increased competitiveness, growth variations between 0.05% and 0.19%, with gains in welfare ranging from US$ 2.26 billion and US$ 3.20 billion.

JEL Classification: F13, F15, C68, H20

Keywords: regional integration, indirect taxes, general equilibrium, *GTAPinGAMS,* sectoral competition.

1. Introduction

Brazil's obsolete, extremely complex tax system has been often considered an impediment to the country's development, causing large variations in price formation, burdening the productive sector, damaging the county's competitive position, and encouraging tax evasion (Silva, 2003a). The tax burden in Brazil is larger than that of the great majority of developing countries (IMF, 2005), as shown Figure 1; and the number of days Brazilians work to pay this annual burden is greater than the developing world average and greater than that

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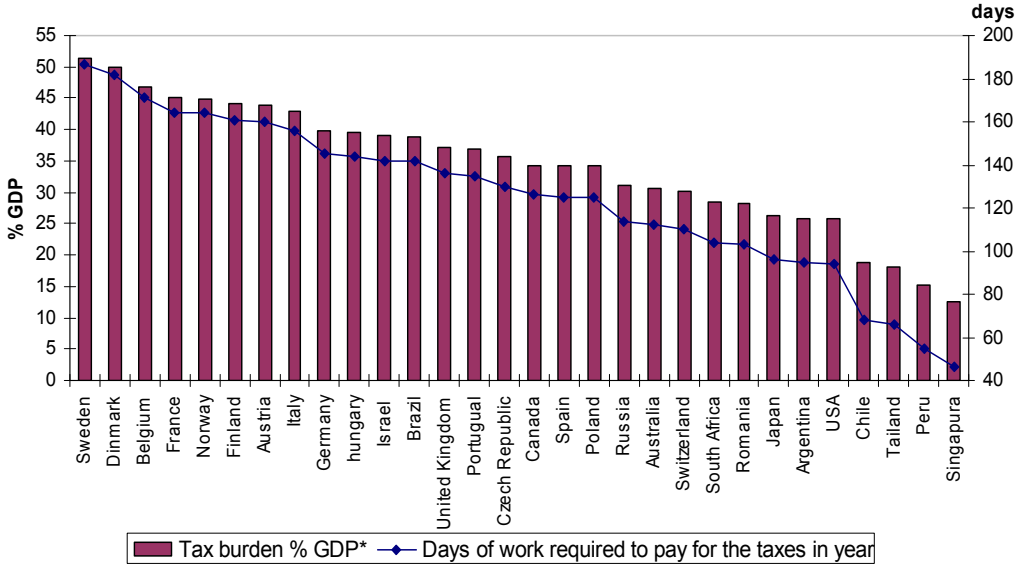
of many industrialized economies, such as in the United States, the United Kingdom, Japan, and Australia.

Figure 1. Tax burden as a percentage of GDP, by country (2002-2004).



* The IMF considers tax burden as being taxes plus social contributions
Source: IMF (2005) - elaborated by the authors.

The Brazilian tax system's collection structure, presenting itself primarily as consumption taxes, exacerbates an existing problem: the inequitable distribution of personal and regional income. Although this form of indirect taxation is considered economically efficient as it does not tax savings, thereby stimulating investment and capital accumulation, it has increased the tax burden on Brazil's least economically viable members, individual consumers. Viana et al. (2000) emphasize that many other studies consider indirect taxation in Brazil to be unequivocally regressive. From the perspectives of economic growth, competitive advantage, and fairness, a change in the Brazilian tax system's structure and a reduction of the local tax burden appears justifiable.

Trade negotiations between the European Union and MERCOSUR have been extensive. Both tariff levels and non-tariff barriers were on the table. Non-tariff issues included the creation of instruments for commercial protection, agreements on animal and vegetable quality standards, agreements on wines, rules regulating services and businesses, rules regulating investment and the movement of capital, the opening of governmental purchases and public works projects, copyright protection, regulations to control competition and cooperation, and mechanisms for the resolution of controversies.

In these non-tariff negotiations, the MERCOSUR countries focused on the creation of agreements regarding animal and vegetable quality standards, polices for competition and cooperation within the competitive arena, and mechanisms for resolving controversies. The countries of the European Union were more concerned about businesses access to services, agreements on wines, investment

and the movement of capital, opening of governmental purchases and public works projects, and copyright protection. Negotiations have stagnated since October 2004, and it is now well past the date for the agreement's conclusion.

At the least, MERCOEURO's ratification would give member countries a greater degree of involvement and stronger strategic position in the international trade market. However, to maximize any strategic gains, MERCOEURO members need to be a step ahead of the international competition. In the case of Brazil, this would necessitate reduced local interest rates, a better balance between government outflows and inflows, a reduction in the costs from deficient infrastructure (the "Brazil cost"), reform of local labor laws, lower bureaucratic outlay, and especially, tax reform.

A number of studies have tried to measure the possible effect of fiscal policy in an open economy. Papers by Shoven and Whalley (1972, 1973) were the first to analyse tax change using applied general equilibrium models. However, according to their 1998 work, this type of study has effective limitations on applicability due to the incidence of tax levied during a constrained time period.

Among other works of prominence, Kehoe and Serra Puche (1983) used a general equilibrium model to analyse Mexico's 1980 fiscal reform. Diao et al. (1998) studied the case of Turkey after fiscal reform and the elimination of all tariffs using a dynamic general equilibrium model.

Braga (1999) published important work focusing on Brazil. The author analysed the effect of taxation policy on Brazilian agribusiness chains using an applied model of general equilibrium applied to the economic environment of 1995. Results suggested that taxation policy as applied to agro-industrial chains should follow three directions: the replacement of intermediate consumption taxes by taxation based on value added; the substitution of indirect taxes for direct ones; and more uniformity among taxes levied on different activities.

Recently, Santos (2006) used a static interregional model of general equilibrium to analyse the impact of reducing three Brazilian indirect taxes: a reduction of consumer taxes on families; a reduction in the indirect taxes on agricultural inputs and resources; and a reduction of indirect taxes on all products within the state of Sao Paulo. The author noted a reduction in poverty after all tax reductions.

This paper main contribution is to model the reduction in the indirect tax, allowing the government tax collection to increase or to reduce depending on the expansion or contraction of the economic activities. Another contribution is the understanding of the effect of the tax policy in the scenarios of regional integration in which Brazil is involved.

Reducing the tax burden should make production more efficient, leading to increased output and income for the production factors' owners, reduced tax evasion, and increased governmental tax collection. The objective of this paper is to determine some effects from MERCOEURO's implementation and some effects from this implementation concurrent with lowered Brazilian taxes on the economies of Brazil and the European Union.

2. Analytical Model

This work is accomplished using the GTAPinGAMS (Rutheford and Paltsev, 2000; Rutheford, 2005) empirical model, which was developed from the Global Trade Analysis Project model (GTAP-2007; Hertel, 1997). GTAPinGAMS uses

the GTAP database constructed as a problem of non-linear complementariness in a General Algebraic Modelling System (GAMS; Brooke et al., 1998). The main GTAP programming language is the GEMPACK (Harrison and Pearson, 1996). In the GEMPACK, the model is resolved (calibrated) as a system of linear equations. Using the Mathiesen's algorithm of sequential complementariness (Mathiesen, 1985), development of GTAPinGAMS allows the model to be concluded as a problem of non-linear complementariness employing the Modelling Program System for General Equilibrium, MPSGE, for resolving models of general equilibrium (Rutheford, 1999).

According to Rutherford (2005), there are substantial differences between GTAP for the GEMPACK and GAMS. In the GEMPACK model, final demand is represented by a function of constant difference demand elasticity (CDE) while final demand in the GAMS model has the Cobb-Douglas form. GAMS modelled account values differ from the GEMPACK modelled account values by a factor of 1,000. While the GTAP database measures transactions in million dollars, GTAP6inGAMS measures the transactions in billion dollars. The GEMPACK model assumes the existence of a "global bank" that allocates capital flows in response to the changes in regional tax returns while the GTAP6inGAMS model assumes that demand for investment and the flow of international capital are exogenous and fixed at the benchmark values.

2.1. The GTAP6inGAMS model

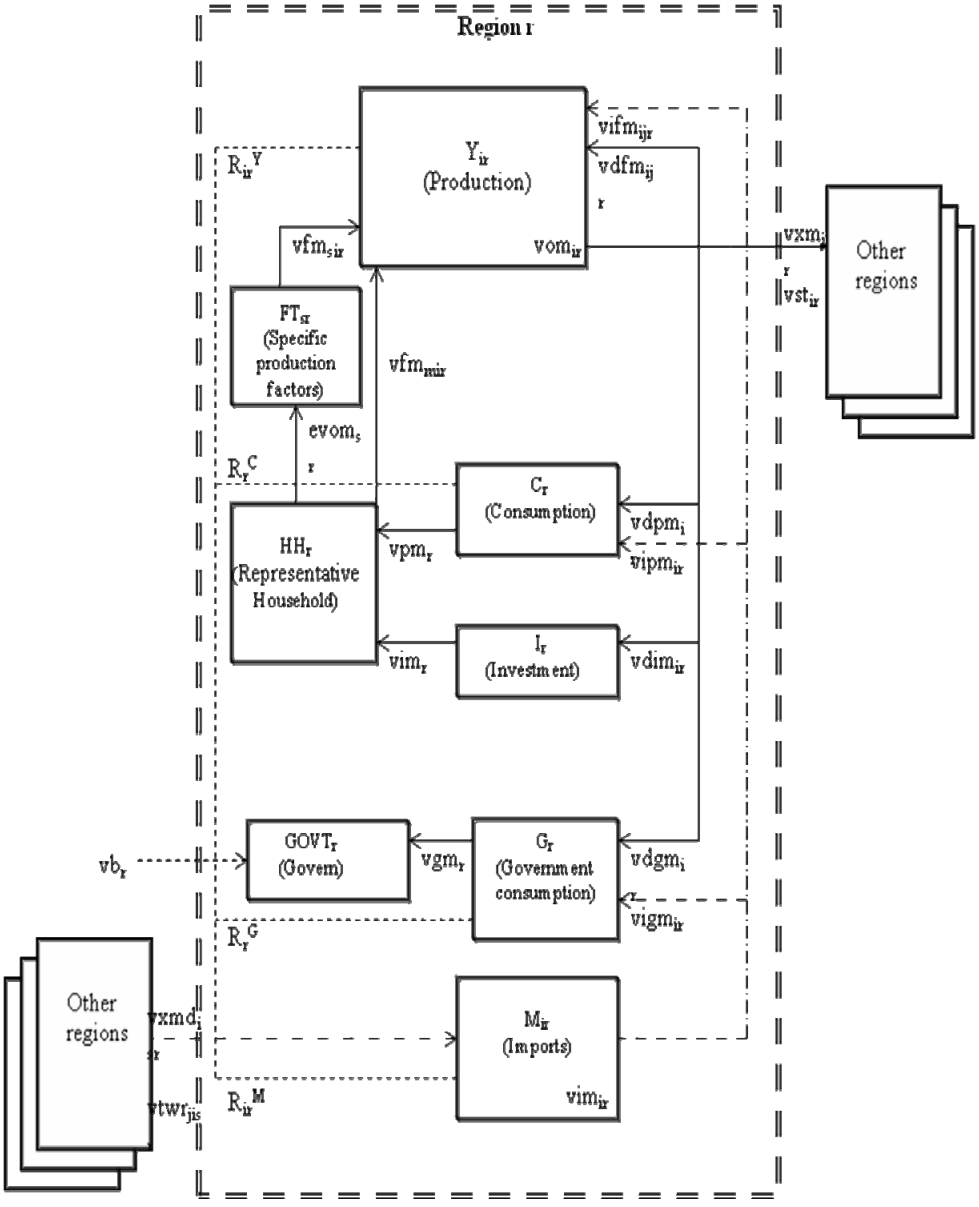
The GTAP6inGAMS model is static, multi-regional, and represents the production and distribution of goods in the worldwide economy. The model is based on consumer behaviour, as it divides the world into regions (or countries) such that each region has a final demand structure comprised of public and private expenses for goods. The consumers' increased welfare is limited by a budgetary restriction, given by the fixed levels of investment and public expenses. Productive process combines intermediate inputs with primary factors (qualified and non-qualified labor, land, natural resources and physical capital) to minimize production costs subject to a given technology. The model's database includes bilateral trade flows among all regions. The database includes transportation costs, and import and export taxes associated with the flow of commerce.

GTAP6inGAMS uses the GTAP database. The model establishes three sets of variables: Regions, represented by subtexts *r* (origin of goods) and *s* (destination of goods); Sectoral Goods, represented by subtext *I,* with *j* representing the firms, and Primary Factors, represented by subtext *f*. With certain limitations, regions, goods, and factors can be aggregated. The economic structure of the GTAP6inGAMS is illustrated in Figure 2. The symbols presented in this flow correspond to the economic model's variables, where, Y_{ir} represents the production of goods *i* in region *r*; and C_r, I_r and G_r represent private consumption, investment, and public demand, respectively. Within region *r*; M_{ir} is importation of goods *i*; HH_r and $GOVT_r$ represent consumption by domestic consumers and government; FT_{sr} represents allocation of the sluggish factors of production (land and natural resources) among individual sectors.

In Figure 2, commodity flows and factor markets are represented by solid lines. The top of the illustration shows domestic and imported goods markets, represented by horizontal lines. The value of the aggregate product determines the market price, vom_{ir}, and is distributed as FOB export value net of export tax,

vxmdirs; international costs of transport, *vstir*; aggregate domestic intermediate demand, *vdfmijr*; aggregate demand of domestic private agents, *vdpmir*; investments, *vdimir*; and aggregate government demand for domestic goods, *vdgmir.*

Figure 2. Structure of a Regional Economy



Source: Adapted from Rutherford (2005)

The equation-identity for domestic products in the GTAP6inGAMS is:

$$vom_{ir} = \sum_{s} vxmd_{irs} + vst_{ir} + \sum_{j} vdfm_{ijr} + vdpm_{ir} + vdgm_{ir} + v\dim_{ir} . \quad (1)$$

The estimated total value of importation, including tariffs to vim_{ir}, is given by the sum of aggregate demand for intermediate imports, $vifm_{jir}$, aggregate private agent import demand, $vipm_{ir}$, and government demand for imported goods, $vigm_{ir}$. This estimate is calculated using the following equation:

$$vim_{ir} = \sum_{j} vifm_{ijr} + vipm_{ir} + vigm_{ir} . \quad (2)$$

The inputs for Y_{jr} include domestic and imported intermediate inputs, mobile production factors [1] (vfm_{jir}, $f \in m$) and sluggish production factors [2] (vfs_{fir}, $f \in s$). Households receive the payment for the primary factors service. The equilibrium in market factors is given by an identity relating the payments for the primary factors service to the income of the factor ($evom_{fr}$):

$$\sum_{i} vfm_{fir} = evom_{fr} . \quad (3)$$

The condition of international market liberalization requires that region *r* exports goods *i,* (vxm_{ir} - top of Figure 2) equal to the value of all goods imported by all its commercial partners ($vxmd_{irs}$ - near bottom of Figure 2):

$$vxm_{ir} = \sum_{s} vxmd_{irs} . \quad (4)$$

The condition of international market liberalization also applies to international transportation services, necessitating that the aggregate value of transport services *j (vtj*) be equal to the total international transport sales for all products in all regions, as represented by equation (5), and that the trade balance in the market for transport service *j* be equal to the supply of transport service for all bilateral trade flows of imputed service, *vtwtjisr*, shown in the latter part of Figure 2, and represented by equation (6) :

$$vt_{j} = \sum_{r} vst_{jr} . \quad (5)$$

$$vt_{j} = \sum_{isr} vtwr_{jisr} . \quad (6)$$

In Figure 2, solid lines indicate government tax revenue and the value of transferences. Entitled flows $\Re$ correspond to the tax revenue.[3] The flow of taxes consists of indirect taxes on production/exportation, $\Re^{Y}_{ir}$, consumption, $\Re^{C}_{r}$,

[1] Indicated by the letter *m.*
[2] Indicated by the letter *s*.
[3] These revenues are not explicitly shown as variables in the GTAP database and are defined on the basis of expenditures and tax rates in a description below.

public demand, $\Re_r^G$, and importation, $\Re_{ir}^M$. Government revenue includes direct taxes on consumers, $\Re_r^{HH}$, and external net transfers, vb_r. The budgetary restriction, vgm_r, is given by:

$$\sum_i \Re_{ir}^Y + \Re_r^C + \Re_r^G + \sum_i \Re_{ir}^M + \Re_r^{HH} + vb_r = vgm_r. \qquad (7)$$

The budgetary restriction on families (8) requires that after tax income from primary factor services is equal to consumption expenditures and private investment (vi_r)[4]:

$$\sum_f evom_{fr} - \Re_r^{HH} = vpm_r + vi_r. \qquad (8)$$

Rutherford (2005) considered two types of consistency conditions, which are part of the GTAP database: market liberalization (i.e., supply = demand of all goods and factors) and balanced income/revenue (net income = net expenditure). The third set of identities entails some operational profit for all economic sectors. The GTAP model defines "production" as being under perfect competition with constant returns to scale; therefore, the model does not allow for surplus profit, as total input costs equal total product values. These conditions are applied to each production sector and are represented by equations (9) through (15):

Y_{ir}: $\sum_f vfm_{fir} + \sum_j \left(vifm_{jir} + vdfm_{jir}\right) + \Re_{ir}^Y = vom_{ir}$. (9)

M_{ir}: $\sum_s \left(vxmd_{isr} + \sum_j vtwr_{jisr}\right) + \Re_{ir}^M = vim_{ir}$. (10)

C_r: $\sum_i \left(vdpm_{ir} + vipm_{ir}\right) + \Re_{ir}^C = vpm_r$. (11)

G_r: $\sum_i \left(vdgm_{ir} + vigm_{ir}\right) + \Re_{ir}^G = vgm_r$. (12)

I_r: $\sum_i v\dim_{ir} = vi_r$. (13)

FT_{fr}: $evom_{fr} = \sum_i vfm_{fir} \quad f \in s$. (14)

YT_j: $\sum_r vst_{jr} = vt_j = \sum_{irs} vtwr_{jirs}$. (15)

[4] For the sake of simplicity, international capital flows are portrayed as part of the public restriction; the difference between family savings and investment is represented by implicit transfers in $\Re_r^{HH}$.

The relationships above are the GTAP model's economic identities but do not describe the behaviour of economic agents, which are taken up by Rutherford (2005).

2.2. Database and GTAP aggregations

Version 6.0 of the GTAP database is used in this study. Compiled for the year 2001, the database has Input-Output Matrices for 87 countries (regions), 57 sectors (commodities) and 5 primary factors, being the Input-Output Matrices for Brazil from 1996. For a complete discussion of the GTAP database see McDougall (2005).

This study analyzes the effect of tax and tariff variations on 11 commodities/sectors and 8 countries/regions (Table 1), emphasizing the agricultural sector because of its importance to Brazil and the other MERCOSUR countries.

2.3. Analytical scenarios and specific aspects of the model

Distinct scenarios that simulate a free trade area between the MERCOSUR and the European Union are analyzed. The scenarios consider the possibility of joint implementation of trade and fiscal policies by the two existing trade blocks.

The MERCOEURO 1 scenario simulates the formation of the MERCOEURO free trade area, an area in which import tariffs between MERCOSUR and European Union member countries are eliminated.

The MERCOEURO 2 scenario simulates the formation of the same MERCOEURO free trade area and a 10% reduction in the effective rates of indirect taxes levied on final consumption in the Brazilian economy.

The MERCOEURO 3 scenario simulates the formation of the MERCOEURO free trade area and a 10% reduction in the effective rates of indirect taxes levied on intermediate inputs in the Brazilian economy.

The MERCOEURO 4 scenario simulates the formation of the MERCOEURO free trade area and a 10% reduction in the effective rates of indirect taxes levied on production in the Brazilian economy.

Subsidies to production and exportation have not been considered because they are recognized as being part of the multilateral negotiations within the scope of the WTO; therefore, outside the purview of regional free trade area negotiations, despite great interest in the removal of such barriers by the MERCOSUR countries.

To make the model more closely resemble the Brazilian economy, it is imposed to the model that government transferences to families remain constant, as the majority of these transferences, by the Brazilian legislation, cannot be reduced.[5] This assumption, within the general equilibrium, necessitated the stipulation that a tax reduction cannot result in a change in family support payments in order to balance government accounts and brings into clearer focus the impacts of tax reduction on the Brazilian economy.

[5] As it is the case of INSS payments (public retirement)

Table 1. Aggregation between regions and commodities made in the GTAP

Regions	*Commodities**
1- USA	1- Paddy rice and processed rice (pdr)
2- Rest of NAFTA (RNF)	2- Wheat (wht)
3- Brazil (BRA)	3- Maize and other cereals (gro)
4- Rest of MERCOSUR (MER) [6]	4- Soybean and other oilseeds - grain, oil and bran (osd)
5- Rest of Latin America (ROA)	5- Sugar cane, sugar beet and sugar (sgr)
6- European Union (EU15) [7]	6- Raw milk, and dairy (mil)
7- New Members of the EU (EU10) [8]	7- Meat and live stock (ctl)
8- Rest of the World (ROW)	8- Other Foods - tobacco, staple fibres, coffee, orange juice, fruits, vegetables and others (fod)
	9- Energy - coal, oil, generation and distribution of electric energy, gas and water (enr)
	10- Manufactures - chemical metals in general, vehicles, products, machines and equipment and others (mfc)
	11- Services and public administration (svc)

Note: * The nomenclature presented in parentheses will be used to facilitate the presentation of the data.
Source: Version 6.0 GTAP database.

3. Results of MERCOEURO Scenarios

The results from simulation of the four scenarios are presented in this section. The section begins with a discussion of variation in the value of sectoral production and regional trade flow arising from the simulation of each scenario, followed by an examination of each scenario's effect on economic growth and wellfare, and concluded with an analysis of each scenario's impact on government tax revenue.

3.1. MERCOEURO 1 - Impacts on production and trade flow

This scenario simulates the removal of import tariffs and export taxes on trade between the countries of MERCOSUR and the European Union (BRA, MER, EU15 and EU10) through the creation of the MERCOEURO free trade area. Table 2 presents the effects on production, exportation and importation from simulation of this scenario as percentile changes from the pre-MERCOEURO condition. Table 2 shows the biggest percentage production value variations occur in Brazil, the Rest of MERCOSUR, the European Union (EU15), and among new members of the European Union (EU10). Results for the Brazilian economy are extremely expressive, with great increases in the production of meats (ctl) (87.09%), sugar (sgr) (28.78%), maize (gro) (18.50%) and other foods (fod) (2.07%) and falls in the

[6] Paraguay will not be analyzed because it is not in the GTAP 6 database.
[7] Germany, Austria, Belgium, Denmark, Spain, Finland, France, Greece, Holland, Ireland, Italy, Luxemburg, Portugal, United Kingdom and Sweden.
[8] Cyprus, Slovakia, Slovenia, Estonia, Hungary, Leetonia and Lithuania, Malta, Poland and Czech Republic.

production of manufactured goods (mfc) (-8.67%), soy (osd) (-7.80%), wheat (wht) (-4.05%) and energy (enr) (-3.53%).

Table 2. MERCOEURO 1: production value and trade flow, percentile variations

Percentile variation in the value of production											
	pdr	wht	gro	osd	sgr	mil	ctl	fod	enr	mfc	svc
USA	-0.33	0.06	0.20	0.58	0.00	-0.02	-0.17	-0.04	0.05	-0.03	0.01
RNF	-0.01	0.06	0.02	0.44	0.01	-0.02	-0.13	-0.03	0.08	-0.03	0.01
BRA	**-0.32**	**-4.05**	**18.50**	**-7.80**	**28.78**	**0.01**	**87.09**	**2.07**	**-3.53**	**-8.67**	**-0.65**
MER	30.53	-0.93	4.22	-3.12	4.94	-0.40	6.61	3.84	-1.85	-0.94	-0.22
ROA	-0.17	0.37	0.11	0.61	-1.25	-0.05	-0.12	-0.18	0.30	-0.05	0.01
EU15	-4.22	-0.27	-3.86	0.69	-9.30	-1.69	-9.23	-0.16	0.11	0.59	0.00
EU10	0.68	-1.81	0.70	3.39	2.03	25.87	3.17	0.76	-0.07	0.65	-0.93
ROW	-0.06	-0.02	0.16	0.59	-0.26	-0.16	-0.48	-0.12	0.07	-0.01	0.02
Percentile variation in the value of exportations – FOB											
	pdr	wht	gro	osd	sgr	mil	ctl	fod	enr	mfc	svc
USA	-1.20	0.14	0.93	2.15	-1.81	-0.86	-2.03	-0.49	0.72	-0.36	0.37
RNF	-2.30	0.08	0.41	1.70	-1.75	-1.44	-0.90	-0.14	0.26	-0.07	0.24
BRA	**-18.44**	**-42.93**	**-11.69**	**-22.81**	**116.01**	**-5.36**	**434.29**	**4.92**	**-25.21**	**-12.77**	**-12.75**
MER	76.97	-3.24	5.07	-5.15	46.26	-5.00	78.01	15.29	-6.95	13.24	-4.68
ROA	-4.45	4.95	1.00	2.85	-4.83	-1.47	-5.27	-0.72	0.50	-0.49	0.45
EU15	-5.68	3.20	0.35	4.56	-22.75	-2.51	-24.80	1.30	0.69	1.21	0.05
EU10	16.71	-12.55	4.98	7.54	52.48	225.94	38.97	16.74	0.22	4.43	-1.94
ROW	-1.08	0.35	0.84	2.00	-9.02	-2.54	-9.04	-0.96	0.27	-0.09	0.30
Percentile variation in the value of importations – FOB											
	pdr	wht	gro	osd	sgr	mil	ctl	fod	enr	mfc	svc
USA	0.03	-0.05	0.04	0.03	-0.68	0.16	-0.25	-0.15	-0.11	-0.16	-0.17
RNF	0.01	-0.03	-0.04	0.28	-1.39	-0.27	0.00	0.00	0.08	0.00	-0.09
BRA	**13.27**	**8.16**	**21.98**	**23.32**	**62.08**	**52.76**	**88.78**	**19.49**	**4.78**	**19.30**	**6.84**
MER	13.05	7.27	5.75	4.49	24.03	27.54	5.62	7.72	1.67	12.90	2.54
ROA	-1.05	-0.75	-0.84	-1.71	-0.46	-0.19	-2.26	-0.46	-0.43	-0.25	-0.20
EU15	5.47	-0.51	0.59	-2.07	57.33	6.81	14.56	0.39	0.15	0.30	0.04
EU10	14.25	63.95	26.60	13.16	87.02	154.85	45.14	20.84	2.19	4.01	0.60
ROW	-0.15	-0.64	-0.48	-1.16	-3.17	0.08	-0.63	-0.13	0.02	-0.07	-0.12

Source: Research results.

The Rest of the MERCOSUR countries presented positive results for the production of rice (pdr) (30.53%), meats (ctl) (6.64%), sugar (sgr) (4.94%), maize (gro) (4.22%) and other foods (fod) (3.84%), but production of soy (osd) (-3.12%), energy (enr) (-1.85) and manufactured goods (mfc) (-0.94%) decreased.

In the European Union (EU15), simulation of MERCOEURO 1 generated generally negative production changes, mainly in the agribusiness sector. There were expressive falls in the production of sugar (sgr) (-9.30%), meats (ctl) (-9.23%), rice (pdr) (-4.22%) and maize (gro) (-3.86%) but slight increases in the production of manufactured goods (mfc) (0.59%) and energy (enr) (0.11%). Simulation of the

scenario resulted in new members of the European Union (EU10) greatly increasing their production of milk and dairy (mil) (25.87%) and less expressively increasing soy and meat production (osd, 3.39%; ctl, 3.17%).

Production in the United States was little affected by the simulated creation of MERCOEURO. The most affected products were soy (osd) (0.58% increase) and rice (pdr) (0.33% fall). Production variations for the other NAFTA countries did not exceed 0.21% except for soy, the production of which increased 0.44%.

All sectors within the remaining portion of Latin America (ROA) showed small production variations, the most sensitive being the sugar sector (sgr) (-1.25%) and the soybeans sector (osd) (0.61%). In the Rest of the World (ROW), the implementation of MERCOEURO caused only small changes in production, with the largest production variations being in the soy (osd) and meats (ctl) sectors, 0.59% and -0.48%, respectively. These minor alterations demonstrate that implementation of a MERCOSUR-EU free trade area would have little impact on production in countries outside of the MERCOEURO economic block.

The largest export changes from the simulation of MERCOEURO 1 were found in the meats and livestock (ctl) segment: 434.29% in Brazil, 78.01% in the Rest of MERCOSUR, and 38.97% in the EU10. These extreme increases were accompanied by reductions in other countries: -24.05% in the EU15, -9.04% in the ROW, -5.27% in the ROA, and -2.03% in the USA. Simulation of MERCOEURO caused rather large variations in the exports of sugar and sugar products, with extreme increases in Brazil (116.01%), EU10 (52.48%) and the Rest of MERCOSUR (46.26%) but noticeable falls in the EU15 (-22.75), ROW (-9.02%) and the Rest of America -ROA (-4.83%). The milk and dairy sector (mil) also showed a strong export increase in the EU10 (225.94%) and a fall in all other countries, with Brazil and the Rest of MERCOSUR suffering the largest decrease, -5.36% and -5.00% respectively. Results for the rice sector (pdr) presented varied results, with Brazilian exports falling 18.44% while exports in the Rest of MERCOSUR and the EU10 expanded 76.97% and 16.71%, respectively.

Brazilian exportation patterns were altered considerably by simulation of MERCOEURO 1, with large increases in the exportation of meats (ctl), sugar (sgr) and other foods (fod), but falls in the exportation of energy (enr) (-25.21%), soy (-22.81%), manufactured goods (mfc) (-12.77%) and services (svc) (-12.75%). Because of the importance of energy, services, manufactures, and soy exportation to the Brazilian economy, these reduced exports have a significant impact on the total value of Brazilian exports.

In general, simulation of MERCOEURO 1 elicited an increase in the value of imports by the MERCOEURO countries and small decrease in the value of imports by all other countries and aggregations (USA., RNF, ROA and ROW). In Brazil, the largest distinguishable level of increase is in the importation of manufactured goods (19.30%), which represents a significant value.

The variation of production caused by formation of MERCOEURO is highly favourable for the majority of Brazilian agribusinesses, with exception of those in the soya (osd), wheat (wht) and rice (pdr) sectors; but it had an adverse affect on production by the manufacturing and energy sectors. The great positive variation shown in the value of production by important Brazilian agribusiness sectors confirms the country's competitive advantage over the EU in agriculture; however, results for the manufacturing sector indicates that EU competition after implementation of MERCOEURO would be economically disadvantageous for Brazil.

3.2. MERCOEURO 2 - Impacts on production and trade flow

This scenario simulates the creation of MERCOEURO as defined in the MERCOEURO 1 scenario and adds a 10% reduction of Brazilian indirect taxes on final consumption. Table 3 presents the effects on production, exportation and importation from simulation of this scenario as percentile changes from the pre-MERCOEURO condition. Simulation of the MERCOEURO 2 scenario resulted in changes that were very similar to those generated by the MERCOEURO 1 scenario; however, some variations were more expressive. For that reason, a comparative analysis between scenarios MERCOEURO 1 and MERCOEURO 2 is presented in the following discussion.

The reduction of Brazilian indirect taxes on final consumption simulated in the MERCOEURO 2 scenario led to greater production variations in all analysed Brazilian sectors than from the simulation of MERCOEURO 1, except for the services sector. Brazilian indirect consumption tax reduction was found to considerably improve Brazilian agricultural product competitiveness in terms of production value. Rice production showed the greatest variation between scenarios, falling in MERCOEURO 1 and increasing in MERCOEURO 2. The manufacturing (mfc) and energy (enr) sectors also showed improved production in MERCOEURO 2 when compared with MERCOEURO 1. Although Brazilian production of manufactures and energy decline in both scenarios, the decline was less in MERCOEURO 2.

Table 3. MERCOEURO 2: production value and trade flow, percentile variations

Percentile variation in the value of the production											
	pdr	wht	gro	osd	sgr	mil	ctl	fod	enr	mfc	svc
USA	-0.33	0.07	0.21	0.58	0.00	-0.02	-0.17	-0.04	0.05	-0.03	0.01
RNF	-0.01	0.07	0.02	0.44	0.01	-0.02	-0.13	-0.03	0.09	-0.03	0.01
BRA	**0.78**	**-3.39**	**18.96**	**-7.30**	**29.73**	**1.14**	**87.80**	**3.16**	**-2.20**	**-7.93**	**-1.00**
MER	30.62	-0.71	4.21	-3.17	4.93	-0.40	6.59	3.84	-1.84	-0.95	-0.22
ROA	-0.17	0.38	0.12	0.62	-1.25	-0.05	-0.12	-0.18	0.31	-0.06	0.01
EU15	-4.21	-0.26	-3.85	0.69	-9.31	-1.69	-9.24	-0.16	0.11	0.59	0.00
EU10	0.68	-1.81	0.70	3.39	2.03	25.87	3.17	0.76	-0.06	0.65	-0.93
ROW	-0.06	-0.02	0.16	0.59	-0.26	-0.16	-0.48	-0.12	0.08	-0.02	0.02
Percentile variation in the value of exportations – FOB											
	pdr	wht	gro	osd	sgr	mil	ctl	fod	enr	mfc	svc
USA	-1.20	0.15	0.94	2.15	-1.83	-0.85	-2.03	-0.48	0.76	-0.36	0.36
RNF	-2.29	0.10	0.42	1.70	-1.76	-1.43	-0.90	-0.14	0.27	-0.07	0.24
BRA	**-18.46**	**-43.24**	**-11.85**	**-22.72**	**116.31**	**-5.14**	**434.50**	**5.11**	**-25.09**	**-12.22**	**-12.25**
MER	77.21	-2.89	5.07	-5.21	46.15	-5.05	77.81	15.27	-6.87	13.30	-4.74
ROA	-4.43	5.24	1.08	2.94	-4.86	-1.47	-5.28	-0.72	0.52	-0.49	0.44
EU15	-5.67	3.20	0.36	4.57	-22.78	-2.51	-24.81	1.30	0.70	1.22	0.04
EU10	16.72	-12.54	4.99	7.54	52.43	225.95	38.96	16.74	0.25	4.43	-1.95
ROW	-1.08	0.36	0.85	2.00	-9.04	-2.54	-9.04	-0.96	0.29	-0.09	0.30

Percentile variation in the value of importations – FOB											
	pdr	wht	gro	osd	sgr	mil	ctl	fod	enr	mfc	svc
USA	0.03	-0.04	0.04	0.03	-0.67	0.16	-0.25	-0.15	-0.11	-0.16	-0.17
RNF	0.01	-0.03	-0.04	0.28	-1.38	-0.27	0.00	0.00	0.08	0.00	-0.08
BRA	**13.97**	**9.15**	**22.88**	**23.98**	**62.79**	**52.99**	**89.18**	**20.34**	**5.64**	**19.68**	**6.60**
MER	13.12	7.39	5.76	4.51	24.12	27.62	5.68	7.76	1.73	12.97	2.57
ROA	-1.05	-0.75	-0.84	-1.71	-0.46	-0.19	-2.25	-0.46	-0.42	-0.24	-0.20
EU15	5.46	-0.51	0.59	-2.07	57.42	6.81	14.57	0.39	0.15	0.30	0.04
EU10	14.25	63.94	26.59	13.16	87.02	154.85	45.14	20.84	2.19	4.01	0.60
ROW	-0.15	-0.65	-0.49	-1.16	-3.16	0.08	-0.63	-0.13	0.02	-0.07	-0.12

Source: Results of the research.

The reduction of indirect taxes on final consumption in MERCOEOURO 2 did not significantly modify the structure of Brazilian exports or imports relative to MERCOEURO 1. As the tax change was the only difference between the conditions stipulated in both scenarios, this finding indicates that internal tax changes in Brazil's relatively small economy would have little effect on international trade.

3.3. MERCOEURO 3 - Impacts on production and trade flow

MERCOEURO 3 simulates the creation of the MERCOEURO free trade area and a 10% reduction in the effective indirect tax that falls on intermediate inputs to the Brazilian economy. Table 4 presents the effects on production, exportation and importation from simulation of this scenario as percentile changes from the pre-MERCOEURO condition. The following offers a comparative analysis of scenarios MERCOEURO 1, MERCOEURO 2, and MERCOEURO 3.

Table 4. MERCOEURO 3: production value and trade flow, percentile variations

Percentile Variations in Production value											
	Pdr	wht	gro	osd	sgr	mil	ctl	fod	enr	mfc	svc
USA	-0.33	0.06	0.20	0.58	0.00	-0.02	-0.17	-0.04	0.05	-0.03	0.01
RNF	-0.01	0.06	0.02	0.44	0.01	-0.02	-0.13	-0.03	0.08	-0.03	0.01
BRA	**-0.12**	**-3.90**	**18.57**	**-7.67**	**28.99**	**0.23**	**87.21**	**2.25**	**-3.31**	**-8.51**	**-0.72**
MER	30.58	-0.90	4.22	-3.13	4.94	-0.39	6.61	3.84	-1.87	-0.94	-0.22
ROA	-0.17	0.37	0.11	0.61	-1.25	-0.05	-0.12	-0.18	0.30	-0.05	0.01
EU15	-4.22	-0.27	-3.85	0.69	-9.31	-1.69	-9.23	-0.16	0.11	0.59	0.00
EU10	0.68	-1.81	0.70	3.39	2.03	25.87	3.17	0.76	-0.07	0.65	-0.93
ROW	-0.06	-0.02	0.16	0.59	-0.26	-0.16	-0.47	-0.12	0.07	-0.01	0.02
Percentile Variations in Exportations – FOB											
	pdr	wht	gro	osd	sgr	mil	ctl	fod	enr	mfc	svc
USA	-1.20	0.14	0.93	2.15	-1.83	-0.85	-2.03	-0.48	0.71	-0.36	0.37
RNF	-2.30	0.09	0.41	1.70	-1.76	-1.44	-0.90	-0.14	0.25	-0.07	0.24
BRA	**-18.52**	**-42.97**	**-11.75**	**-22.78**	**116.29**	**-5.47**	**434.02**	**4.93**	**-25.01**	**-12.47**	**-12.81**
MER	77.08	-3.19	5.07	-5.17	46.20	-4.94	78.01	15.29	-7.03	13.30	-4.69
ROA	-4.44	5.00	1.02	2.88	-4.85	-1.46	-5.26	-0.72	0.49	-0.49	0.45

EU15	-5.68	3.20	0.35	4.56	-22.78	-2.51	-24.79	1.30	0.68	1.21	0.05
EU10	16.71	-12.55	4.98	7.54	52.43	225.95	38.99	16.74	0.21	4.43	-1.94
ROW	-1.08	0.35	0.84	2.00	-9.04	-2.54	-9.04	-0.96	0.27	-0.09	0.30

Percentile variations in Importations – FOB

	pdr	wht	gro	osd	sgr	Mil	ctl	fod	enr	mfc	svc
USA	0.03	-0.05	0.04	0.03	-0.67	0.16	-0.25	-0.15	-0.11	-0.16	-0.18
RNF	0.01	-0.03	-0.04	0.28	-1.38	-0.27	0.00	0.00	0.08	0.00	-0.09
BRA	**13.56**	**8.33**	**22.15**	**23.50**	**62.27**	**53.20**	**89.07**	**19.75**	**4.50**	**19.50**	**6.98**
MER	13.07	7.29	5.75	4.49	24.09	27.55	5.63	7.72	1.67	12.93	2.55
ROA	-1.05	-0.75	-0.84	-1.71	-0.46	-0.20	-2.26	-0.46	-0.43	-0.24	-0.20
EU15	5.47	-0.50	0.59	-2.07	57.42	6.81	14.55	0.39	0.15	0.30	0.04
EU10	14.25	63.95	26.59	13.16	87.02	154.85	45.14	20.84	2.19	4.01	0.60
ROW	-0.15	-0.64	-0.49	-1.16	-3.16	0.08	-0.64	-0.13	0.01	-0.07	-0.12

Source: Research Results.

Results from MERCOEURO 3 most closely resemble those from MERCOEURO 1. The 10% reduction in Brazilian indirect taxes on intermediate inputs caused a small improvement in the value of Brazilian production in all but the services sector relative to MERCOEURO 1 and presented a small decrease in production in all but the service sector relative to MERCOEURO 2.

The reduction of indirect taxes on intermediate inputs did not alter Brazilian export values or the structure of Brazilian exportation significantly. This result is similar to that from simulation of MERCOEURO 1 and 2.

The value of imports by all sectors of the Brazilian economy increased a bit after simulation of MERCOEURO 3; although, these increases did not significantly change the structure of worldwide importation. Changes in importation from simulation of MERCOEURO 3 were even less significant than those from MERCOEURO 2.

3.4. MERCOEURO 4 - Impacts on production and trade flow

MERCOEURO 4 simulates the creation of the tariff free area and a 10% reduction in the effective Brazilian indirect tax that falls on production. Table 5 presents the effects on production, exportation and importation from simulation of this scenario as percentile changes from the pre-MERCOEURO condition.

Table 5. MERCOEURO 4: production value and trade flow, percentile variations

Percentile variations in Production

	pdr	wht	gro	osd	sgr	mil	ctl	Fod	enr	mfc	svc
USA	-0.33	0.06	0.22	0.60	0.00	-0.02	-0.16	-0.03	0.05	-0.03	0.01
RNF	-0.01	0.07	0.02	0.45	0.01	-0.02	-0.12	-0.03	0.08	-0.04	0.01
BRA	**-0.03**	**-4.92**	**18.12**	**-7.81**	**28.96**	**0.39**	**86.36**	**2.38**	**-3.11**	**-8.04**	**-0.81**
MER	30.74	-0.84	4.24	-3.12	4.96	-0.37	6.65	3.85	-1.86	-0.97	-0.22
ROA	-0.16	0.38	0.12	0.63	-1.23	-0.05	-0.11	-0.18	0.30	-0.06	0.02
EU15	-4.21	-0.26	-3.81	0.71	-9.27	-1.69	-9.16	-0.16	0.11	0.58	0.00
EU10	0.68	-1.80	0.72	3.40	2.04	25.87	3.22	0.76	-0.07	0.64	-0.93
ROW	-0.06	-0.02	0.17	0.60	-0.26	-0.16	-0.47	-0.12	0.07	-0.02	0.02

Percentile Variations in Exportation – FOB

	pdr	wht	gro	osd	sgr	mil	ctl	fod	enr	mfc	svc
USA	-1.19	0.15	0.97	2.20	-1.76	-0.84	-1.98	-0.47	0.73	-0.37	0.38
RNF	-2.29	0.10	0.45	1.75	-1.73	-1.42	-0.87	-0.13	0.26	-0.07	0.25
BRA	**-19.50**	**-44.60**	**-12.57**	**-23.37**	**115.35**	**-6.67**	**429.29**	**4.63**	**-24.88**	**-11.83**	**-13.36**
MER	77.50	-3.10	5.10	-5.15	46.36	-4.74	78.45	15.31	-6.96	13.22	-4.70
ROA	-4.42	5.09	1.07	2.99	-4.79	-1.46	-5.18	-0.71	0.50	-0.50	0.45
EU15	-5.67	3.19	0.40	4.63	-22.68	-2.50	-24.62	1.31	0.68	1.20	0.05
EU10	16.72	-12.58	5.02	7.60	52.62	225.94	39.36	16.75	0.22	4.42	-1.94
ROW	-1.08	0.36	0.90	2.06	-8.97	-2.53	-8.97	-0.96	0.27	-0.10	0.31

Percentile variations in Importations – FOB

	pdr	wht	gro	osd	sgr	mil	ctl	fod	enr	mfc	svc
USA	0.03	-0.04	0.04	0.03	-0.69	0.16	-0.26	-0.15	-0.11	-0.16	-0.18
RNF	0.01	-0.03	-0.03	0.29	-1.41	-0.27	0.00	0.00	0.08	0.00	-0.09
BRA	**14.52**	**8.61**	**22.59**	**24.02**	**63.06**	**54.51**	**89.81**	**20.20**	**4.93**	**19.32**	**7.40**
MER	13.07	7.34	5.77	4.52	23.96	27.49	5.51	7.70	1.69	12.97	2.55
ROA	-1.05	-0.74	-0.84	-1.73	-0.47	-0.20	-2.29	-0.47	-0.43	-0.24	-0.20
EU15	5.47	-0.50	0.59	-2.10	57.15	6.81	14.37	0.39	0.15	0.30	0.04
EU10	14.25	63.98	26.59	13.16	87.02	154.86	45.13	20.84	2.19	4.01	0.60
ROW	-0.15	-0.65	-0.49	-1.18	-3.21	0.08	-0.65	-0.13	0.02	-0.07	-0.12

Source: Research Results.

Variation in the value of production from simulation of MERCOEURO 4 in comparison to MERCOEURO 1 is positive in some sectors and negative in others: The rice (pdr), sugar (sgr), milk (mil) and other foods (fod) sectors showed small improvements in terms of production value in comparison with MERCOEURO 1 while the wheat (wht), maize (gro), Soya (osd), meat (ctl), energy (enr), manufactured (mfc) and services (svc) sectors presented small declines relative to MERCOEURO 1. This behaviour differs significantly from that found in MERCOEURO 2 and MERCOEURO 3, in which the value of production improved relative to MERCOEURO 1 in all sectors except services.

As in the preceding three scenarios, simulation of MERCOEURO 4 diminished the total value of all Brazilian sectors' exports[9] and elicited increases in the total value of all Brazilian sectors imports.

It is noted that simulation of MERCOEURO 2 led to the best sectoral production results of all scenarios, indicating that a reduction of Brazilian indirect taxes on final consumption generates superior sectoral competitiveness within MERCOEURO.

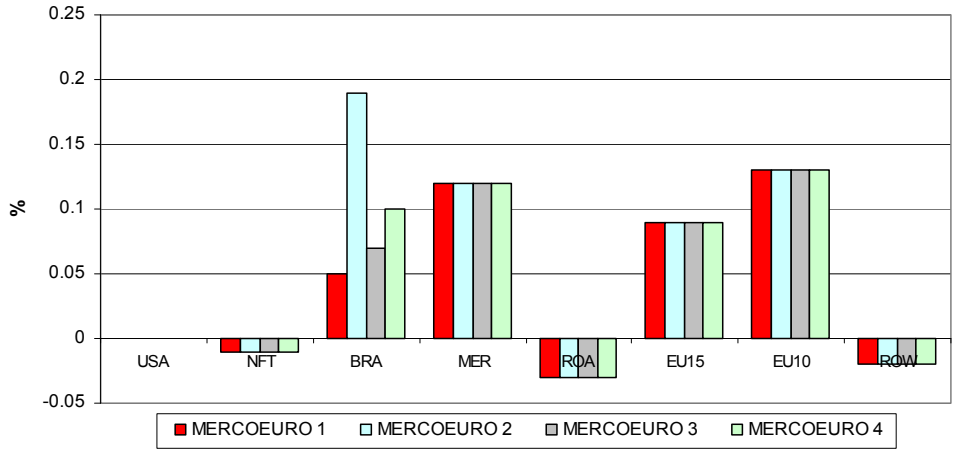
3.5. MERCOEURO's Impact on Growth and Wealth indicators

Figure 3 shows the percentile GDP variation in the analysed regions/ countries from simulation of scenarios MERCOEURO 1, 2, 3, and 4. It is observed that after implementation of MERCOEURO (MERCOEURO 1), some countries/regions

[9] Except in the manufacturing sector (mfc).

present very small variations[10], such as the Rest of NAFTA (-0.01%), the Rest of America (-0.03%) and ROW (-0.02%). These results are virtually the same in all scenarios. The variations are slightly more significant in the Rest of MERCOSUR (0.12%), EU15 (0.09%) and EU10 (0.13%) while the GDP of the United States remained unaffected in all scenarios.

Figure 3. Percentile variation in Gross Domestic Product (GDP) from Scenarios MERCOEURO 1, 2, 3 & 4.



Source: research data.

The results for Brazilian GDP are quite different. The formation of MERCOEURO in the first scenario caused Brazilian GDP to increase 0.05%. After inclusion of the 10% reduction of indirect Brazilian taxes on final consumption (MERCOEURO 2), the country's GDP increased 0.19%. Simulation of MERCOEURO 3, with its 10% reduction of indirect taxes on intermediate inputs, caused Brazilian GDP to increase 0.07%; and the 10% reduction of indirect taxes on production simulated in MERCOEURO 4 caused a 0.10% increase in Brazilian GDP. The reduction of Brazilian indirect taxes on final consumption generated the most significant GDP growth, most probably because the structure of the country's indirect taxation has its greatest impact on final consumer.

To summarize, the creation of MERCOEURO does not significantly affect GDP growth; although, the countries that do benefit from MERCOEURO are countries allied within MERCOEURO. Countries outside MERCOEURO are unaffected by the pact.

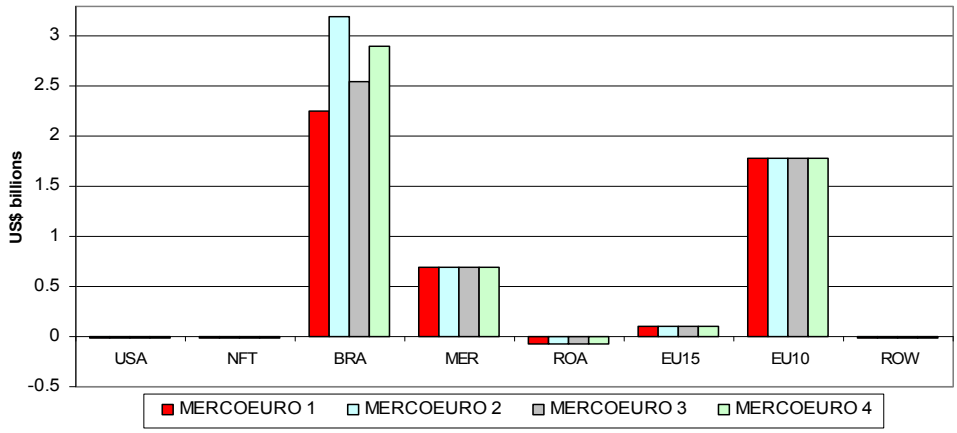
Figure 4 demonstrates gains in welfare caused by the formation of MERCOEURO, represented by equivalent variations from the benchmark.

The simulated elimination of commercial restraints and concurrent fall in domestic prices generated increased wealth in all MERCOEURO allied countries in all scenarios. In Brazil, the gains totalled US$ 2.26 billion from simulation of MERCOEURO 1, US$ 3.20 billion in MERCOEURO 2, US$ 2.55 billion in

[10] The variations are between brackets.

MERCOEURO 3, and US$ 2.90 billion in MERCOEURO 4. Brazil showed the greatest wealth/welfare gains of all countries and regions in all scenarios.

Figure 4. Gains in welfare from simulation of scenarios MERCOEURO 1, 2, 3 & 4 (US$ billions)



Source: Research data.

Gains for the Rest of MERCOSUR were US$ 0.69 billion in MERCOEURO 1 and 3 and US$ 0.70 billion in MERCOEURO 2 and 4. The EU15 gained US$ 0.11 billion, the EU10 gained US$ 1.79 billion, and the countries outside MERCOEURO (USA, NAFTA, ROA, ROW) showed very small welfare/wealth losses in all scenarios.

3.6. Impacts on government revenue from the formation of MERCOEURO

Table 6 (A Appendix) shows government revenue and percentage variation from the 2001 *benchmark* after simulation of the four scenarios, in US$ trillions. In Brazil, an increase in government revenue from the benchmark occurs in all scenarios. This data should assist government decision makers when determining indirect tax reductions. It must be emphasised that these are long-term results and that it is possible to occur adjustments of a short-term macroeconomic nature.

In the Rest of MERCOSUR, the results indicate revenue gains varying from 1.177 to 1.191%. In the Rest of America (ROA), the results show a slight fall in government revenue. Government revenue in the other regions increased as follows: 0.062% in EU15; 0.263% in EU10 and 0.016% in ROW (Table 6, A Appendix).

For the long term, these results are in opposition to the stated beliefs that a reduction of the tax burden would generate revenue loss and consequent growth decline. It must also be emphasised, that major gains, both for private and public sectors, would arise from the simulated commercial agreement.

4. Conclusions

MERCOEURO was found to be advantageous for Brazilian agro-business interests and less so for the Brazilian manufacturing sector, which may suffer from unfettered European competition. These results point out the importance of improving Brazilian manufacturing sector efficiency should MERCOEURO be implemented. Results also indicate that the implementation of MERCOEURO and a reduction in Brazilian indirect taxes would improve its industries' competitive position, its citizens' welfare, its government's tax revenues, and its economic rate of growth.

The main contribution of this research is the generation of a model to calculate the effects of indirect tax reduction that includes an estimate of government tax revenue variation. This study also presents the effect of tax reform on regionally integrated trade areas and the effects of targeted tax changes on various economic sectors.

It was found that the reduction of Brazilian indirect taxes on the final consumption had the most beneficial impact in terms of Brazilian competitiveness, GDP growth, and social welfare while the reduction of indirect taxes on production lead to the largest government tax revenue gains.

The results did not account for short term shocks from the simulated tax reductions. It is suggest that to avoid a short term loss in government revenue, the tax and tariff reductions should be gradual.

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Appendix

Table 6. Government revenue (GR - US$ trillions) and the percentile variation (Δ%) from 2001 data – MERCOERUO 1, 2, 3, & 4

Scenarios:	*Benchmark*	MERCOEURO1		MERCOEURO2		MERCOEURO3		MERCOEURO4	
	Government Revenue	GR	Δ %	GR	Δ %	GR	Δ %	GR	Δ %
USA	0.987	0.987	0.008	0.987	0.008	0.987	0.008	0.987	0.008
NFT	0.229	0.229	0.032	0.229	0.032	0.229	0.032	0.229	0.032
BRA	**0.123**	**0.128**	**3.787**	**0.127**	**3.400**	**0.128**	**3.805**	**0.128**	**3.967**
MER	0.069	0.070	1.177	0.070	1.191	0.070	1.180	0.070	1.183
ROA	0.077	0.077	-0.016	0.077	-0.015	0.077	-0.017	0.077	-0.016
EU15	1.991	1.992	0.062	1.992	0.062	1.992	0.062	1.992	0.062
EU10	0.090	0.091	0.261	0.091	0.261	0.091	0.261	0.091	0.263
ROW	1.794	1.794	0.016	1.794	0.016	1.794	0.015	1.794	0.016

Source: Research results

THE IMPACT OF HUMAN CAPITAL DEVELOPMENT ON ECONOMIC GROWTH

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Abstract. Creating a socially and environmentally sustainable future, requires governments and private business to re-think their resource utilization strategies. The question could be asked whether an investment in human capital development could contribute to sustainable economic growth. In order to test this possibility, a study on the concepts of sustainable development, emphasising the interrelationship between human development and economic was conducted, which considered 45 countries' GDPs and its corresponding HDI. Based on the analysis, it was found that there is a positive relationship between a country's HDI and its overall prosperity as indicated by its GDP.

JEL Classification: M10, M14, M41

Keywords: human development, economic growth, organisational sustainability.

1. Introduction

1.1. Background

The modern day business environment offers multiple and diverse opportunities and threats to a firm. Management should therefore design, evaluate and implement optimal action-plans, specifying where and how to compete in this competitive environment. These action plans could include possible diversification in order to identify and establish opportunities for growth and entering into strategic alliances to optimise the value-chain (Seisreiner & Träger, 2004). However, management should always keep the primary objective of a firm, namely the creation and maximisation of shareholder-value, in mind (Arnold, 2005; Jensen, 2001). Shareholders therefore expect senior management to manage the firm in

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such a way that it will deliver sustainable growth in the form of dividends and/or capital growth.

In order to achieve this sustainability objective, firms should manage five types of capital successful, namely *natural* capital, *manufactured* capital, *financial* capital, *human* capital and *social* capital. The latter is the glue that not only binds together the first four types of capital, but also the goodwill of different stakeholder-groups of the firm (MacGillivray, 2004). According to Bosman (2007) human capital is often the hardest to manage, but also has the potential to have a major impact, positive or negative, on a firm. However, no firm can operate in isolation, and there are wide-ranging economic as well as political influences which could impact a firm's quest for sustainability, specifically as pertaining to human capital.

1.2. Problem statement

The creation of a sustainable future is it economically, socially or environmentally, requires governments, societies, firms and individuals to rethink their resource utilisation, their individual objectives as well as their interactions with each other. There is increasing recognition that all the aforementioned stakeholders form part of a complex and interdependent system and that certain of their behaviours are causing irreparable damage to the society and environment at large. Firms are part of an increasingly complex and global system, drawing on and impacting on this system. The concept of sustainable development poses a challenge to the traditional mindset of firms and according to Project Sigma (2008) organisational performances are not only judged by the services, products and profits they make, but also on the impact they have on human, social and environmental (or natural) capital.

One of the biggest challenges facing governments' and firms' quest for sustainability, is the development of human capital. Human capital development is a development paradigm that is much less about the rise or fall of incomes, and more about creating an environment in which people can develop to their full potential and lead productive and creative lives in accordance with their needs and interests. According to the United Nations Development Program (UNDP) people are nations' and firms' real wealth (UNDP, 2008a). Firms are dependent on policies related to the economy, education and politics in the countries they are doing business in, in their quest for sustainability. The primary research question of this paper could therefore be formulated as follows:

P1: Could a national investment in the development of human capital contribute to sustainable economic growth?

In this paper, the impact of human development and capital investment on sustainable economic growth will be considered with a specific emphasis on:

- A focus on human capital as a way to achieve the goal of sustainability;
- The concept of economic growth
- The impact of human capital on economic growth.

2. Human Capital Development

2.1. Introduction

The roots of the world's sustainability crisis are often seen as social and political. According to Bosman (2007) and Adams *et al.* (2004) corporate firms

have the global reach, resources and motivation to achieve sustainability. The concept of sustainable development gained popularity with the publication of the World Commission on Environment and Development's report "Our Common Future" (Tomlinson, 1987), which stated that there should be a new era of economic growth. The questions are what kind of growth was being prescribed, and what kind of growth is seen as compatible with sustainable development? The answers from the report were that the world should quickly design strategies that would allow nations to move from the present (and often destructive) processes of growth and development onto sustainable development paths. Although the report is mainly focused on the environment, it also highlights the importance of social development. According to Langhelle (1999) it further states that poverty and the lack of social development could result in the destruction of the environment and that, given the current population growth rates, the goal of reducing poverty requires national income growth.

Sustainable development could be defined as development that meets the needs of the present generation without compromising the ability of future generations to meet their own needs (Buys *et al.,* 2009; Adams *et al.*, 2004). Business sustainability could therefore be defined as adopting business strategies and activities that meet the needs of the enterprise and its stakeholders today while protecting, sustaining and enhancing the human and natural resources that will be needed in the future (Labuschagne *et al.,* 2005).

2.2. Capital development

To achieve sustainability, within a country's macro–economic environment or within a firm's micro economic environment, five types of capital should be managed holistically to reflect its overall impact on wealth and sustainability, in the broadest sense (Project Sigma, 2008; MacGillivray, 2004):

- Natural capital, i.e. the environment;
- Manufactured capital, i.e. the infrastructure and fixed assets;
- Financial capital, i.e. the profits and losses, revenues, shares and cash;
- Human capital, i.e. the people;
- Social capital, i.e. the social relationships and structures;

These capital types provide a basis for understanding sustainable development in terms of the economic concept of wealth creation. It is preferable that firms utilise all types of capital to deliver their products or services and according to Project Sigma (2008) a sustainable organisation will maintain and enhance these stocks of capital assets, rather than deplete or degrade them. Furthermore the capital types could apply at every stage of a product's or service's lifecycle throughout the supply chain. Therefore a product or service will be based on a combination of all the capitals. Each of the five types of capital is relevant in a firm context and should therefore be managed to enhance the firm's performance (Project Sigma, 2008). However, economic forces could set limits to what management could do, and create opportunities for management action, but they do not by themselves determine what a business is or what it does (Drucker, 2007). It is therefore important to focus on the importance of human capital in creating wealth.

2.3. Human capital

According to Manpower (2008) the current global skills shortage makes it is necessary for countries as a whole, and firms individually, to increase their

investment in human capital to build a sustainable investment environment. Skills shortage could be defined as the demand for a particular type of worker that exceed the supply of such workers (Richardson, 2007). It is more likely that investors will invest in countries with political, social and economical policies that support economic growth and promote sustainable business opportunities (Bezuidenhout & Naudé, 2008). The availability of a skilled workforce would certainly influence the investor's choice of investment. It is therefore necessary for countries to focus on the development of their human capital (UNDP, 2008b). Collins (2001) acknowledged the fact that there is a move away from the old saying that people are a firm's greatest asset towards the saying that the right people are a firm's greatest asset.

The basic objective of human capital development should be to create an environment which enables people to enjoy long, healthy and productive lives. Development is thus about expanding people's choices in leading the lives they value. It is about much more than economic growth, which is only a means (albeit a very important one) of enlarging people's choices (UNDP, 2008a). Even though the primary objective of development is to benefit people, the technical considerations of the means to achieve human development and the use of statistical aggregates to measure national income and its growth, often obscures this fact. National income figures do not reveal the composition of income, or the real beneficiaries thereof. Furthermore, people often value achievements that do not feature at all, or not immediately, in higher measured income or growth figures. Better nutrition and health services, greater access to knowledge, more secure livelihoods, better working conditions and a sense of participating in the economic, cultural and political activities of their communities do not necessarily lead to higher income. Even though people want higher incomes as one of their available options, income is not the only sum total of human life (UNDP, 1999a).

The measurement of human development should focus on the three essential elements of human life, namely longevity, knowledge and decent living standards (UNDP, 1990b).

- Firstly, the importance of live expectancy lies in the common belief that a long life is valuable, both in itself and in the various indirect benefits, for example adequate nutrition and good health.
- Secondly, literacy figures as the indicator used to measure knowledge, is a crude reflection of access to education so necessary for productive life in modern society. However, literacy is the first step in learning and knowledge-building.
- Thirdly, a key component of human development, command over resources for a decent living, is often measured as per capita income. It would be necessary to adjust per capita income to provide better approximations of the relative power to buy commodities and gain command over resources for a decent living standard.

However, the expansion of output and wealth is only a means to achieve the end objective of development namely human well-being.

3. Economic growth

3.1. Introduction

Economic growth is probably the most important factor to ensure sustainable development (Langhelle, 1999: 130). The simplest definition of economic growth is an increase in *real* gross domestic product (or inflation adjusted GDP). The growth rate of real GDP is the percentage change from one year to the next. Economic growth has important implications for sustainable development and the welfare of individuals. According to Barro and Sala-i-Martin (2004) aggregate growth is probably the single most important factor affecting individual levels of income. As an example the real per capita GDP in the USA grew by a factor of 10 from $3,340 in 1870 to $33,330 in 2000. This corresponds to a growth rate of 1.80 percent per year. The USA per capita GDP would only have been $9,450 in 2000 if the annual growth rate was only 0.8 percent from 1870, but $127,000 if the growth rate was 2.8 percent per year for the same period. Therefore, understanding the determinants of aggregate economic growth is the key to understand how to increase the standards of living and lessening world poverty. A question many scholars try to answer is why some nations are rich whilst others are poor. Olson (1996) identified two possible of explanations of the great differences in per capita income across nations:

- The first possibility is that national borders mark differences in the scarcity of productive resources. In other words the poor countries are poor because they are short of resources, such as land and natural resources, human capital, equipment that embodies the latest technologies or other types of resources.
- The second possibility is that national boundaries mark the borders of public policies and institutions that are not only different, but in some cases better and in other cases worse. The countries with the best policies and institutions achieve their potential, while other countries do not. Individuals and firms in the non-achieving countries may display great ingenuity and rationalism in these difficult conditions but because they do not have a structure of incentives that bring forth the productive cooperation, they do not succeed in meeting their potential.

Soludo and Kim (2003) states that economic growth primarily results from two sources, namely i) the accumulation of factor inputs (physical capital and labour) and ii) the efficient use of factor inputs (total factor productivity or TFP). The source of economic growth is important because of the nature of factor accumulation and the concern for long-run sustainability of growth. According to the neoclassical growth model, which is supported by empirical evidence, factor accumulation exhibits diminishing returns (Soludo & Kim, 2003). Thus, for sustainable long-term growth a country cannot rely solely on factor accumulation, but must have growth in TFP.

Many important decisions, such as savings, investments, innovations and the accumulation of human capital are the results of decisions taken by microeconomic agents, affect economic growth. It is therefore important that any understanding of growth should begin with the behaviours of these micro agents.

3.2. Micro-economic determinants of economic growth

Two key microeconomic agents include households and firms (Guriev & Salehi-Isfahani, 2003: 79). It could be assumed that even though households and firms across the globe are rational, they do make different decisions because they operate under different constraints (Guriev & Salehi-Isfahani, 2003). However, for sustainable economic growth to take place, households should supply factors of production, i.e. labour, physical capital and human capital, and firms should put these factors to best use by adopting better technologies.

3.2.1. Households

Guriev and Salehi-Isfahani (2003) states that the most important household decisions affecting economic growth, are to reproduce, to save and to transfer knowledge and assets to the next generation. Furthermore, these decisions are interdependent to each other and are also affected by the environment in which the families find themselves. Guriev and Salehi-Isfahani (2003) also states that economic growth could fundamentally transform household decisions. For example, in the course of economic development, strategies based on high fertility and low investment in children make way for strategies based on lower fertility and higher investment in human capital.

Savings and investment decisions are also closely linked with fertility and human capital decisions. It is widely believed that high fertility in part serves the purpose of providing for old age (Guriev & Salehi-Isfahani, 2003). With the development of credit markets, households were able to postpone consumption by lending-practices when young and consuming when old, which according to Guriev and Salehi-Isfahani (2003) resulted in smaller families and a greater bequest in the form of human capital.

3.2.2. Firms

Firms use the factors supplied by the households to deliver on the production requirements and make the investment decisions. Two types of firms can be distinguished, namely small businesses and large firms, each which faces different types of challenges. According to Guriev and Salehi-Isfahani (2003) small businesses' main challenge is to survive and grow, whilst the large firms' main task is to adapt in response to changing external conditions and increase productivity.

In developing countries small business often play a more crucial role than in developed countries. However, according to Guriev and Salehi-Isfahani (2003) small businesses often operate in a rather hostile environment facing numerous barriers to entry, such as imperfections in credit and insurance markets, rent-seeking, predatory regulations and taxation by government officials. This can often result in the lack of growth in such small businesses. Therefore, some small businesses may even decide to stay in the informal sector rather than moving into the formal sector. The educational levels of clients, lack of capital and staff related incentives and skills development could also hamper growth (Mukama *et al.*, 2005).

In addition to the small businesses, the larger firms also play a major role in economic development. However, the incentive for large firms to restructure and invest in new technologies often depends on its external environment. Theoretically, efficiency-enhancing restructuring would be undertaken once a firm

is privatised. However, privatisation does not always bring about restructuring and productivity gains. This could be because of underdeveloped corporate governance policies with limited investor and owner protection, subsidies and soft-budget constraints as well as the lack of competition (Guriev & Salehi-Isfahani, 2003). Existing literature suggests that the strongest incentive for restructuring is provided by competition and the diffusion of modern technologies (Djankov & Murrell, 2002; Brown & Earle, 2000; Guriev & Ickes, 2000, Kuncoro, 2000; Tybout, 2000).

3.3. Markets and economic growth

Markets provide the mechanics through which economic resources are channelled and where the economic incentives are set. Efficient markets are therefore crucial to economic growth and its proper functioning is critical to both static and dynamic market efficiencies, as well as its responsiveness to economic shocks. Furthermore, while both product and factor markets are important in allocating resources, factor markets also influence the rate of resource-creation (Jurajda & Mitchell, 2003). Jurajda and Mitchell (2003) also states that the financial markets contribute to economic growth through the provision of adequate instruments for saving, the channelling of resources from savers to borrowers (the resource-allocation function) and the reallocation of resources when their current uses are no longer the most profitable.

According to Jurajda and Mitchell (2003) the economic link flowing from labour markets to economic growth occur through the allocation and reallocation function of labour markets and its role in supporting the production and efficient use of human capital, while the link flowing from economic growth to the labour markets is likely to occur through the build-up of infrastructure as a result of economic growth. Natural resources could be considered as an additional factor of production. Sachs and Warner (2001) state that the natural-resource abundance may even depress a country's economic growth opportunities. This could, according to Jurajda and Mitchell (2003), be because natural resources, if not well-managed, will impede growth through rent-seeking and could lead to serious policy failures. Jurajda and Mitchell (2003) states that product markets affect growth through the efficiency of the mix of goods and services produced, the rate of productivity-enhancing innovations and the ease of firm creation:

- An optimum mix of goods that does not reflect the economy's comparative advantage does not allow exports to grow at the rate they otherwise would;
- Production of goods for which the production process generates positive externalities with respect of growth, such as learning-by-doing, or acquisition of tacit knowledge can also enhance growth; and
- The ease with which new firms may be created may also influence the amount of innovation in an economy and the ability of markets to reallocate resources from unprofitable to profitable sectors.

4. Human development and economic growth

4.1. Introduction

Even though economic growth is essential for human development, there is not an obvious automatic link between such economic growth and human progress. One of the greatest challenges could be to formulate policies to ensure

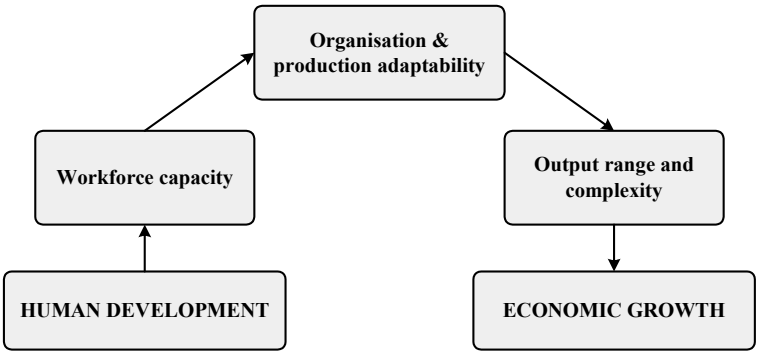
that economic growth translates into human development (UNDP, 1999b). It would therefore be necessary to distinguish between the concept of *development* and the concept of *growth*. The Oxford Advanced Learner's Dictionary (2006) defines growth as an increase in economic activity, while development is defined as a gradual growth of the economy so that it becomes more advanced and stronger. Although these two concepts are often used interchangeably and while they are intimately related, they are clearly distinct. Sen (1999) distinguishes between *growth* and *development* by stating that development goes further than the accumulation of wealth and increase in gross national product and other income-related variables into areas where wealth is used for the improvement of overall living conditions and quality of life.

The concept of development should therefore focus on the development of human capital. Even though economic growth (or the increase in per capita GDP), is a critical part of economic development, it remains merely a measure of capacity. The extra wealth on its own does not guarantee that the population is less poor, more educated, healthier, or that the economy is in a better position to grow further. To determine the effect of economic growth on the population, it would be necessary to know how the extra money is distributed and how it is used. A poor country with a growing economy may still develop little if the growth merely enriches a small privileged group, leaving the majority of the population without any additional income. Nor does a poor country develop when its income is spent on things like arms imports, rather than on public goods (Kosack & Tobin, 2006).

4.2. Human development dimension

One of the most effective means of sustained human development could be through economic growth, with an equitable distribution of income. Furthermore, well-structured social expenditure programmes by government could also significantly improved human development in a relatively short period of time (UNDP, 1999b). Ranis *et al.* (2000) empirically determined that economic growth and human development can contribute to each other. However countries which focus mainly on economic growth rather than human development could find themselves spiralling downwards in a vicious cycle in which poor performance in both growth and human development reinforce each other. Figure 1 illustrates how human development may contribute towards economic growth.

Figure 1: From human development to growth



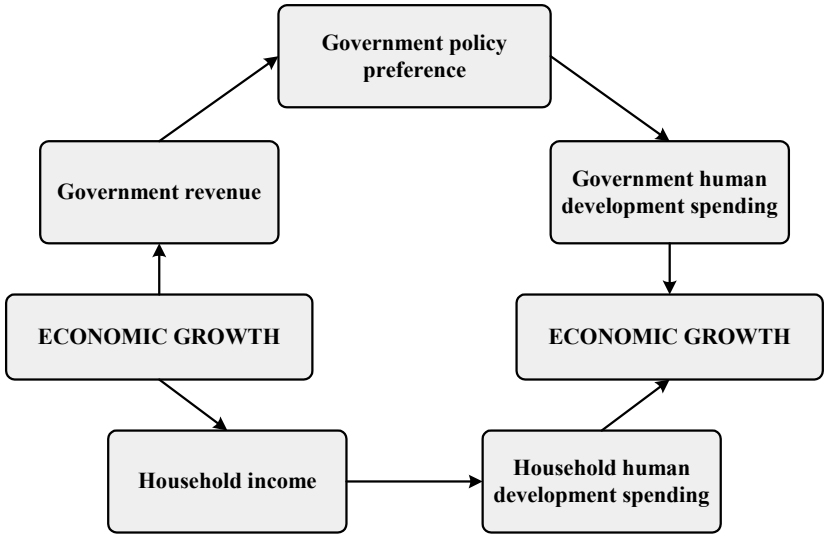
Source: adapted from Kosack & Tobin, 2006

The figure illustrates that human development contributes to economic growth by increasing the capacity of the workforce, which in turn could change a firm's adaptability of production and the range and complexity of economic output. This contributes to growth in the national income through, among other things, social capital.

4.3. Economic growth dimension

Economic growth could contribute to human development by directly increasing government revenues, which may then be reinvested further in human development (Kosack & Tobin, 2006:209). Furthermore, growth could also contribute to the increase in household income, who could invest this income in their own health, education and welfare. Health and education of a population are among the key determinants of the composition and growth of outputs and exports, and constitute an important ingredient in a system's capacity to borrow foreign technology effectively. Furthermore, health, education and nutrition could also contribute to enhancing worker productivity. Secondary education, including vocational training, improves the acquisition of skills and managerial capacity, while tertiary education supports the development of basic science, the appropriate selection of technology imports and the domestic adaptation and development of technologies. Secondary and tertiary education also represents critical elements in the development of key institutions, for example government, the law and the financial system, which is all critical for economic growth (Ranis *et al.*, 2000:201). Figure 2 illustrates how economic growth potentially supports human development.

Figure 2: From growth to human development

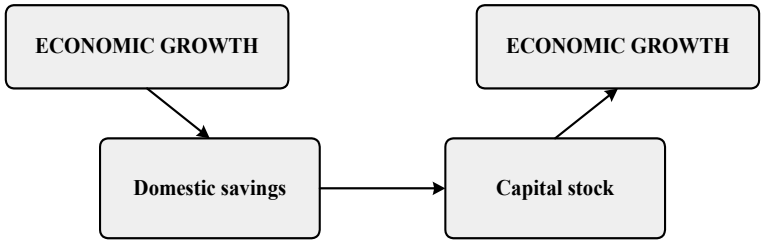


Source: adapted from Kosack & Tobin, 2006

The figure illustrates the two routes in which economic growth may impact on human development. Firstly, national economic growth potentially enhances

household income, which enables such households to spend more money on its own social upliftment. Secondly, increased government income should enable government to spend more funds in their social upliftment programs. However, growth could also contribute to further growth directly, therefore bypassing human development to a certain extend, as illustrated in figure 3 below.

Figure 3: From growth to growth



Source : adapted from Kosack & Tobin, 2006

The figure above illustrates that an increase in income could lead to the increase in savings, which in turn leads to the increase in capital stock. The increase in capital stock increases productivity, and thereby contributes to further growth. It is important to note that growth where human development is absent is likely to lead a country into a vicious cycle of both low growth and low human development (Kosack & Tobin, 2006).

5. Empirical study

5.1. Research method

The primary objective of this paper is therefore to determine whether there is a positive relationship between human development and capital investment, which could contribute to sustainable economic growth. Before considering the empirical results, it is necessary to clarify the research field and the techniques used in the paper.

5.1.1. Research field

Much of the world's natural resources could be found in countries with medium or low human development indexes. It is therefore important to consider the possible contribution of the mining sector on the development of human capital and economic growth. Literature shows that many developing countries with large mining sectors had some difficulty in converting mineral wealth into economic development (Stern, 1995; Stern, 1994). In many countries the mining sector has been blamed for the underdevelopment or slow growth of the economy. There could be two potential reasons why the presence of natural resources might exert negative effects on growth and development.

- The first is that weak institutions could generate conditions through which interest groups devote their energies to try to capture the economic rents from natural resources. The allocation of talent in such an economy is distorted, and resources are diverted to unproductive activities (Bravo-Ortega & De Gregorio, 2005; Lane & Tornell, 1996).

- The second reason is related to the allocation of different resources among different activities with different spill-over effects on cumulative growth. For example, if there is a choice to allocate resources to either the exploitation of natural resources or the production of goods subject to endogenous growth, the presence of abundant natural resources could cause capital to be diverted to their extraction, thus diminishing the resources available for other growth-enhancing activities (Bravo-Ortega & De Gregorio, 2005).

Research indicates that natural resources could hamper growth in countries with a low level of human capital, but that in economies with an abundance of human capital, natural resources could propel growth (Bravo-Ortega & De Gregorio, 2005). For example, a minimum of 5.5 years of schooling would be necessary for natural resources to have a net positive effect on growth. The negative effect on growth arise as the natural resources sector draws economic resources from other sectors that would otherwise be capable of generating further economic growth. The main resource that is normally siphoned off from these growth-enhancing activities is human capital. A good example is developed countries with abundance of natural resources and human capital, such as Australia, New Zealand, Scandinavia and the USA. These countries have a very small amount of exports in natural resources as part of their GDP. This could indicate that they utilise their own resources in other sectors such as industrial. A country that is rich in natural resources can start with a high level of income, accumulate human capital and see its growth accelerate. However, extremely low levels of human capital may cause such an economy to stagnate, because it tends to specialise in natural resource extraction. Furthermore, it is not enough to create a larger pool of educated people. There must be opportunities for them to be productively employed or it might simply increase the number of educated unemployed.

5.1.2. Research technique

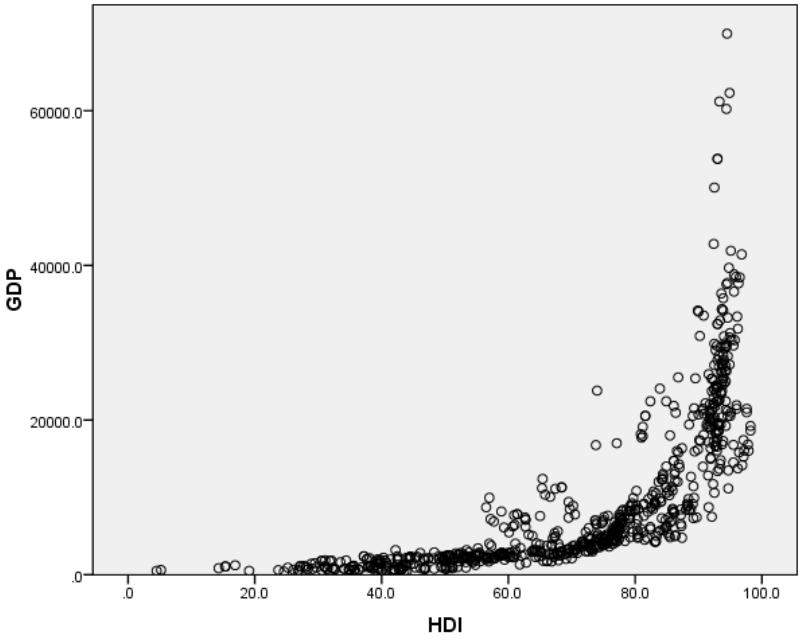
The research method employed in this paper to address the objectives consists of both a literature study and statistical empirical analysis. The literature study reflected on the concepts of sustainable development, with the specific emphasis on human development, economic growth and the relationship between the two. The empirical analysis of the paper is based on a longitudinal data set over 16 years and consists of forty-five (45) countries. The countries selected are those in which the top-40 mining firms in the world, based on the PricewaterhouseCoopers mining survey (Goldsmith & Burkitt, 2008), are operating in. The relationship between GDP per capita (stated in US$) and human development, as per the human development indexes (or HDI) of the UNDP Development Reports from 1990 to 2005 has been statistically determined by fitting a multilevel growth model. A multilevel model (also referred to as a hierarchical model) provide a way of examining differences across the relevant populations and pool the information for the different groups (in this instance the countries) without assuming that they belong to precisely the same population. Hierarchical models also enable the examination of the extent to which regression coefficients vary across the different countries (or sub-populations), while at the same time borrowing strength from the full sample (Singer, 1998:343). In the analysis of the data the PROC MIXED option in SAS version 9.1 statistical software was used to fit a two-level growth model (SAS, 2008).

5.2. Empirical findings

5.2.1. Multilevel model

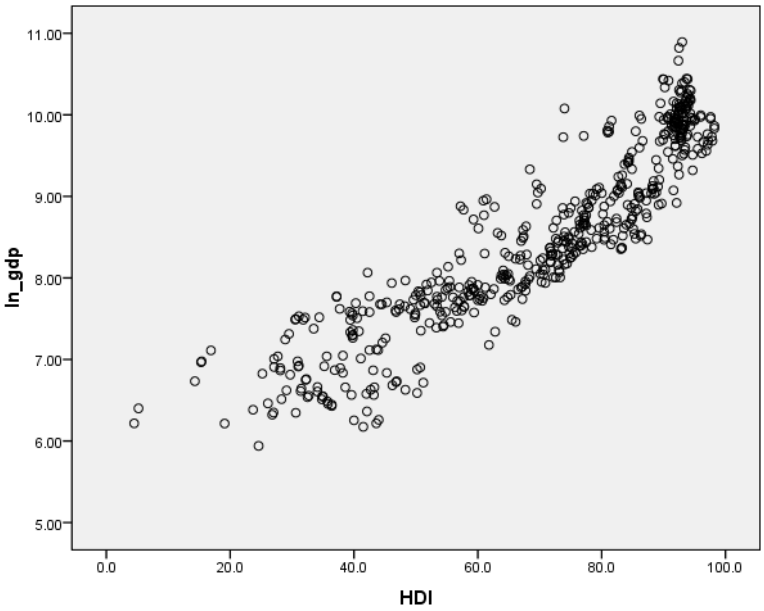
As a point of departure a linear individual growth model was used in order to model the relationship between GDP and HDI. A linear is an equation that specifies a linear relationship among the variables gives an approximate description of some economic behaviour (Anon, 2009). The GDP per capita was chosen as the dependent variable and HDI as the independent variable, because this paper focuses on the effect of human development on economic growth. Figure 4 below present the results as a scatter plot of the total sample (over all the countries and the years) for GDP vs. HDI data analysis.

Figure 4: Scatter plot of GDP vs. HDI



An alternative approach is to consider a linear relationship among log-transformed variables (Anon, 2009). It is evident from figure 4 above that the relationship between the GDP and HDI data is curve linear. A linear transformation on the data therefore becomes necessary and a log transformation on GDP-data was used to further analyse the data. Figure 5 present the log transformed data of GDP vs. HDI analysis.

Figure 5: Scatter plot of log transformed GDP vs HDI



From figure 5 above it is observed that the relationship between the two variables is more of linear pattern and therefore a log-linear growth model is fitted to the data. In a log-linear model the coefficients can be interpreted as partial elasticity coefficients. The log transformation compresses the measurement scale of the data and interpretation of the variances must take this into consideration.

5.2.2. Unconditional linear growth model

The next step in the analysis is a simple two-level model. In this model the level-1 model is a linear country growth model vs. time (in this instance the 16 years), while the level-2 model expresses the variation in the parameters between the relevant countries. Level-1 of this model is given by the following formula:

$$lnGDP_{ij} = \pi_{0j} + \pi_{1j}(Time)_{ij} + r_{ij},$$

$$r_{ij} \sim N(0, \sigma^2)$$

$$i = 1, 2, \ldots, n \ (number\ of\ years)$$

$$j = 1, 2, \ldots n \ (number\ of\ countries)$$

and in level-2 the $lnGDP_{ij}$ is the log transformed GDP per capita whilst $(Time)_{ij}$

is a coded variable for year and :

$$\pi_{0j} = \beta_{00} + u_{0j},$$

$$\pi_{1j} = \beta_{10} + u_{1j},$$

$$\begin{pmatrix} u_{0j} \\ u_{1j} \end{pmatrix} \sim N\left[\begin{pmatrix} 0 \\ 0 \end{pmatrix}, \begin{pmatrix} \tau_{00} & \tau_{01} \\ \tau_{10} & \tau_{11} \end{pmatrix}\right]$$

Level-1 in the model contains three random effects namely i) the *Intercept* for each country, ii) the *Time* slope for each country, and iii) the within country residual r_{ij}. Level-2 contains two fixed effects (for the intercept and for the effect of Time).

Table 1: Results of fitting multilevel growth of model log GDP vs HDI

Fixed effects	Estimate	Standard error	p-values
Intercept $\hat{\beta}_{00}$	8.2245	0.1560	<0.001*
Time $\hat{\beta}_{10}$	0.0412	0.0053	<0.001*
Variance-covariance components for random effects			
$\hat{\tau}_{00}$	1.0890	0.2335	<0.001
$\hat{\tau}_{01} = \hat{\tau}_{10}$	0.0030	0.0056	0.5904
$\hat{\tau}_{11}$	0.0012	0.0013	<0.001
$\hat{\sigma}^2$	0.0234	0.0013	<0.001

* Significant at 5% level

Because this is an individual growth model with no level-2 covariates, the fixed effects can be interpreted in the usual way: $\hat{\beta}_{00}$ =8.2245 is the estimate of the average *lnGDP* across countries at *Time*=0 and $\hat{\beta}_{10}$ =0.04122 is the estimate of the average slope across countries over time. This can therefore be interpreted that from one year to next year there is a 4.12% increase in GDP (remember this is a log-linear model). The null hypothesis that either of these parameters are zero in the population are rejected (p-value for intercept and time < 0.05).
The next focus is on the random effects. The null hypothesis that these variance-covariance parameters are zero in the population are all rejected except the covariance parameter (variance between intercepts and slopes). The terms of most interest are $\hat{\tau}_{00}$ and $\hat{\tau}_{11}$, which are significant from zero (p value<0.05), and illustrates that there is variation in both the intercepts and slopes between

countries that potentially can be explained by a level-2 (country-level) covariate, which is elaborated on further next.

5.2.3. Linear growth model with country-level covariate

In the previous section an unconditional growth model was fitted to the data set. Following from this consideration is given to a model which analyses whether variation in intercepts and slopes is related to the covariate HDI. Level-1 of this model is given by the following formula:

$$lnGDP_{ij} = \pi_{0j} + \pi_{1j}(Time)_{ij} + r_{ij},$$

$$r_{ij} \sim N(0, \sigma^2)$$

$$i = 1, 2, \ldots, n \ (number\ of\ years)$$

$$j = 1, 2, \ldots n \ (number\ of\ countries)$$

where in level-2 the $\ln GDP_{ij}$ is the log transformed GDP per capita and $(Time)_{ij}$ is a coded variable for year, the same as in previous section and

$$\pi_{0j} = \beta_{00} + \beta_{01}(HDI_j - \overline{HDI}) + u_{0j},$$

$$\pi_{1j} = \beta_{10} + \beta_{11}(HDI_j - \overline{HDI}) + u_{1j},$$

$$\begin{pmatrix} u_{0j} \\ u_{1j} \end{pmatrix} \sim N\left[\begin{pmatrix} 0 \\ 0 \end{pmatrix}, \begin{pmatrix} \tau_{00} & \tau_{01} \\ \tau_{10} & \tau_{11} \end{pmatrix}\right],$$

and $(HDI_j - \overline{HDI})$ is the independent variable HDI centered at its grand mean. The reason for centering is to simplify the interpretation of the fixed effects, β_{00} and β_{10}. The interpretation of the fixed effects would be based upon conceiving of a case in which the value of *HDI* is zero, which will never be the case, therefore the centering (Singer, 1998).

Table 2: Results of multilevel growth model on log GDP vs HDI

Fixed effects	Estimate	Standard error	p-values
Intercept ($\hat{\beta}_{00}$)	8.2245	0.0859	<0.0001
cen_HDI* ($\hat{\beta}_{01}$)	0.0211	0.0015	<0.0001
Time ($\hat{\beta}_{10}$)	0.0411	0.0049	<0.0001
Time× cen_HDI** ($\hat{\beta}_{11}$)	0.0007	0.0002	0.0002
Variance-covariance components for random effects			
$\hat{\tau}_{00}$	0.3250	0.0786	<0.0001
$\hat{\tau}_{01} = \hat{\tau}_{10}$	0.0002	0.0033	0.9457
$\hat{\tau}_{11}$	0.0009	0.0002	<0.0001
$\hat{\sigma}^2$	0.0234	0.0011	<0.0001

* cen_HDI = $(HDI_j - \overline{HDI})$,

** interaction effect between $(Time)$ and $(HDI_j - \overline{HDI})$

Since the independent variable HDI is centered, the estimate for the intercept and $Time$ are identical to what they were in the model estimated in the previous section and the interpretation is similar. The only difference is the interpretation of the added covariate, *HDI*. The coefficients for the centered *HDI* and its interaction with $Time$ are new.

The coefficient for cen_HDI ($\hat{\beta}_{01}$) is significant in the model (p-value<0.05) indicate that a country that differs by 1% in HDI has a GDP growth that differ by 4.11%. The estimates for the variance-covariance components for the random effects have changed. Comparing these estimates to those from the unconditional model we observe that the variance-covariance components slightly decreased, improving the fit of the growth rates. The variance component for the growth rate went from 0.0012 to 0.0009. These values are calculated on the log transformed data. Computing (0.0012-0.0009)/0.0012=0.25, in other words, the covariate HDI accounts for 25% of the explainable variation in the growth of GDP.

6. Concluding discussion

Research findings

When establishing a new firm, capital investment is required for the acquisition of assets, which can then be used in the production of goods or services. In order to obtain such capital, investors must be persuaded to invest in a firm's operations, as opposed to all other investment alternatives. These investors will often base their investment-decision on the possible future value of a firm and its risk profile. In return for their investment, investors expect an adequate return to increase and maximise the value of their investment. Value can be created either

through an increase in returns, reduction of risks or a trade-off between the two (Correia *et al*., 2007).

All products and services are a combination of human skill and knowledge, natural materials and social structures, using machinery and infrastructure and financial investment. However, a business enterprise is created and managed by people. Recent development experiences have underlined the need for paying close attention to the link between economic growth and human development. The essence of the development process is the transformation of small informal firms into large formal ones. However, due to the barriers that small businesses may face, many of them are often stuck in the informal sector with limited opportunities. Many economies therefore find themselves in a low-level equilibrium where the size of the informal sector remains very high.

This paper analysed the possible relationships and correlations between the economic growth (as expressed in the real per capita GDP) and human development (as expressed in the HDI). As a departure point of the research a linear model, followed by a log-linear model was utilised to gauge the possible relationships between the HDI and the GDP. These models illustrate that there is some linear relationship between the two variables. To further analyse the relationships, two multi-level (or hierarchical) models were fitted to the data. The first unconditional linear growth model indicated that there is a 4.12% per annum growth in the GDP of the sample population. However, this model did not take into account the country-level covariate, which was considered with the second linear growth model with country-level covariate. This model found that the GDP growth rate due to an increase in HDI was around 4.11% per unit growth in HDI. Finally, converting this log-linear it was then found that the covariate HDI accounts for 25% of the explainable variation in the growth of GDP. It could therefore be concluded that an investment in human capital could significantly contribute to economic growth.

Additional remarks

It is important for government as well as private firms to have a focussed human development investment plan to ensure long-term sustainable development. Fedderke (2005) found that it is the quality of education, and not the quantity of education that is important for economic growth. A focus on knowledge and skills, and not necessarily education, will contribute to growth. Furthermore, the impact of HIV/AIDS could also be detrimental to economic growth. It is estimated that the impact of HIV/AIDS on countries with advanced epidemics range anywhere between 0.1 and 4.4 percentage points in the average annual GDP growth rates over the next 10 to 20 years (Smit *et al*., 2006). The roots of the world's sustainability crisis are social and political, but corporate firms have the global reach, resources and motivation to achieve sustainability.

Considerations for further research

Although the study did find a positive relationship between an increase in HDI and economic growth as expressed in GDP, it has to be remembered that HDI as an index, consists out of various components including longevity, knowledge and decent living standards as expressed in per capita GDP. Further future research could analyse the possible relationships between economic growth and the different elements of HDI. Building on this research, future projects could also

consider the impact of human capital on individual firm profitability and the creation of shareholder value.

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EMPIRICAL RESEARCH REGARDING THE METHODS USED BY SUPERVISORY AUTHORITIES IN CAPITAL ADEQUACY. STANDARDIZED APPROACH VERSUS INTERNAL RATING MODELS BASED APPROACH

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Abstract:
The Basel II Accord describes the advanced risk measurement approaches and the minimum requirements regarding the level of capital that banks need to cover these risks. The objective of our paper is to realize a first diagnostic about the attitude manifested by a sample of states from the European Union regarding the approaches used to determine the adequate level of capital. Through an empirical study we have analyzed the risk aversion that some states, members of the European Union, have practically manifested by the option regarding the approaches used to determine the capital allocation. The options were chosen by each state and there were attributed a series of factors, manifested at different levels. The first step necessary for testing the eventually future correlations was the quantification of the reaction registered by each country regarding the transition from traditional methods that determine the capital to the modern ones.

JEL Classification: G01, G21, G32, C22

Keywords: risk management, Basel II Accord, risk modelling, risk weighted assets, internal model based approach

1. Introduction and literature review

The new Accord, Basel II, recognizes the progresses registered in the credit risk management and brings some stimulants in order to permit banks to use their own sophisticated and advanced risk management models. Also, the accord introduces the concept of devising the potential losses of the credit institutions into expected losses and unexpected losses. The expected losses are treated as a component part of the institution's costs, being covered through the price system

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established for the products given to the clients and through the provisions system. On the other hand, the unexpected losses depends on the core capital of the credit institution, which covers these losses in a way that the normal activity of the bank it is not affected.

Milton Friedman and Leonard Savage (1948) were the first who defined the risk aversion through the utilization of the next decisional situation: an investor who can choose between comparable investment projects will always choose the less risky one. The investor behaviour through the function of the risky investment's rentability has lead to a new perspective about the risk aversion theory. The literature in the domain shows that the investors have different behaviours regarding the risk which they take, the risk aversion being the one that dominates these behaviours. Friedman and Savage (1948) demonstrated that the main factor which modifies in time the investors' attitude is the dimension of the capital.

The first remarkable efforts which determine the factors that influence the risk aversion were made by John W. Pratt and Kenneth J. Arrow (*Aspects of the Theory of Risk-Bearing*, 1965). Their observations started from the idea that an investor with a high-risk aversion it is less determines to assume that risk, in other words the price for him to assume that risk it is very high. Due to this approach, the principal factor that determines the risk aversion is the capital of the investor and the expected shortfall of the investment project. In addition, the risk aversion theory has demonstrated that the acceptance of a risky investment will appear when there is a surplus prime.

The financial literature has demonstrated that even if there are a series of differences between countries regarding the perception about risk, also there are similarities regarding the reaction to risk (Weber and Hsee, 1998). From our analysis point of view it is taken into consideration the attitude of a country towards the option regarding the approach used in the allocation of capital, after an analyze made at the national level by the supervision authorities.

Through an empirical study we have analyzed the risk aversion that some states, members of the European Union, have practically manifested by the option regarding the approaches used to determine the capital allocation. The options were chosen by each state and there were attributed a series of factors, manifested at different levels. The first step necessary for testing the eventually future correlations was the quantification of the reaction registered by each country regarding the transition from traditional methods that determine the capital to the modern ones.

2. The theoretical argumentation of the considered options

The Basel II Accord describes the advanced risk measurement approaches and the minimum requirements regarding the level of capital that banks need to cover these risks. The minimum capital requirements involve three components:

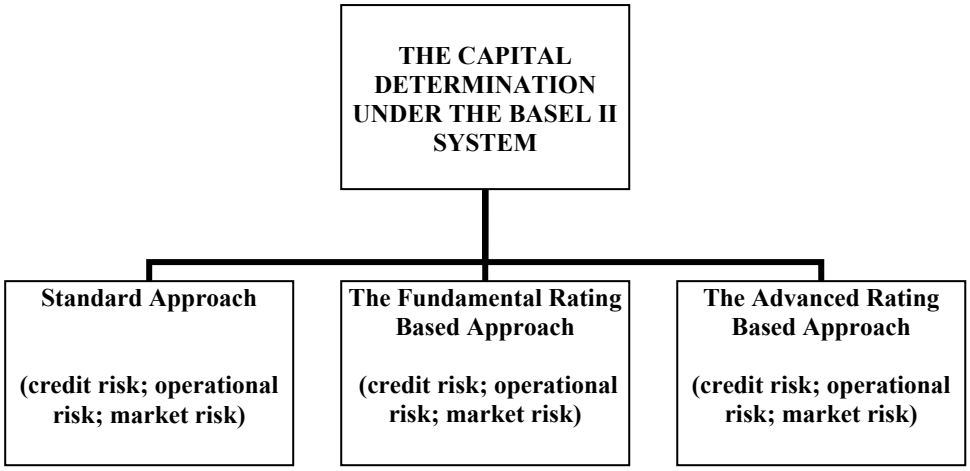
1. The capital definition (unchanged in comparison with the Basel I Accord);
2. The definition of the risk weighted assets (RWA);
3. The report between the capital and the RWA (which has been maintained at 8%).

Similarly with the previous accord, the capital minimum requirements are calculated as a product between the risk weighted assets and the 8% requirement:

$$Capital = (\sum_{k} RWA) \times 8\%$$

The risk weighted assets could be determined by two approaches: the standard approach and the approach based on internally generated ratings. Using the internal models means suppose their validation by the supervisory authority before implementing them. The internal model validation of the credit institutions implies a series of tests with the aim to determine if the model is eligible or not for being used in the capital allocation process. In accordance with this, the National Bank of Romania has elaborated a series of validation processes for all types of risk foreseen in the first pillar: credit risk, market risk and operational risk (BCBS, 2005).

Figure 1: The capital determination for risk management proposed by Basel II



Source: adapted model from the Basel Committee on Banking Supervision

In the first stage, the credit institutions have to realize the validation of the internal models and after this the supervisory authority would asses the way that the validation has been made by banks. According to the Basel II "it is possible that the supervisory authority will use some of the validation techniques applied by the credit institution". The validation made (BCBS, 2005) by the credit institution has two stages: the validation of the system and the validation of the process.

3. The practical assessment of the considered options

The objective of our study is to realize a first diagnostic about the attitude manifested by a sample of states from the European Union regarding the

approaches used to determine the adequate level of capital. We consider that this study is an intermediary step due to the transition moment of many countries and its repentance after the finalization process it is opportune. Even in this phase we consider that, the results would be extremely useful in analyzing the situation of Romania and for the integration of the results in the context of the results registered by other European countries.

We also consider that the risk aversion theory could be implemented by realizing the correlation between the capital dimensioning and the investments made by the banking institutions in order to meet the level of capital imposed by the supervisory authorities. In this sense, it is necessary a quantification of the risk aversion, manifested towards the analyzed countries. We propose to analyze this by considering the opinions expressed at the national level by each country considered, regarding the approaches adopted to determine the level of capital required. Next, we will explain the options quantified, providing a detailed presentation for each country considered. In addition, we will present the pro and cons arguments whish stays at the decision of each country.

Option 1: the inclusion of the interim profits
Applied by: Austria, Cyprus, Czech, Denmark;
Not applied by: Romania;

- Pros: the history in applying this option permits the conception of a case study which rakes into account the influence of the interim profit on the own resources;
- Cons: the credit institutions should allocate supplementary funds for the external audit, having a negative influence on the bank's profitability.

Option 2: no deduction from the own resources of the temporary participations in institutions from financial sector
Applied by: England, France;
Not applied by: Romania;

- Pros: a more powerful control from the supervisory authorities, because it is necessary their approvals;
- Cons: by the deduction form the own resources of the participations discussed above the supervisory authorities would impose more restrictive conditions for the banks.

Option 3: no deduction of the participations in entities from the assurance sector
Applied by: France, Italy;
Not applied by: Romania;

- Pros: quantitative analysis specific for assessing the impact of the different options, deduction or alternative variants;
- Cons: using this methodology it is not possible to delimitate the methods and the supervisory policies specific to banking groups.

Option 4: the calculation of the own funds individually by each credit institution which is supervised on a consolidated base
Applied by: France, Italy;
Not applied by: England, Romania;

- Pros: the option doesn't foreseen any deduction of the participations in credit institutions
- Cons: using this methodology it is not possible to delimitate the methods and the supervisory policies specific to banking groups.

Option 5: the possibility that the subsidiaries of the credit institutions would be excepted from meeting the requirements on an individual basis
Applied by: France, Italy;
Not applied by: England, Romania;

- Pros: this option is correct when both the mother institution and its subsidiaries are subdued to the authorization and supervision of the respective state;
- Cons: there exist too many conditions to be fulfilled in order to exercise this option, especially the material and legal, actual or anticipated impediments, which makes hard the transfer of own resourced in any moment.

Option 6: the subsidiaries which their mother company have large exposures and significant debts, should be taken into consideration
Applied by: England;
Not applied by: Romania;

- Pros: it would be taken into consideration the induced effects to the other companies in the group, which should be added to those included in the individual reports;
- Cons: in extreme cases, the whole capital necessary to cover the risk it is owned by the consolidated subsidiary.

Option 7: the possibility of not limiting the significant participations in the assurance and reassurance companies
Applied by: England, France, Belgium, Romania;
Not applied by: Austria;

- Pros: it is a prudential measure for limiting the concentration risk and the risks induced by the participation in other activities than those of the baking sector;
- Cons: the approach might not be the prudent one if the risk that banks might face by sustaining the assurance companies' activity exceeds significantly the level of the participations.

Option 8: the possibility of not limiting the significant participations in activities other than those specific to credit institutions, if the sums that exceed these limits are deduced from the own funds
Applied by: England, France, Belgium;
Not applied by: Romania, Austria;

- Pros: the member states might dispose that the competent authorities would not apply limits regarding the significant participations if it is assured that 100% of the sums that exceed these levels are covered from own resources;

- Cons: we have to take into consideration that the effects of the risks that the credit institution is exposed to, especially the reputational risk, through the participations in companies that don't apply prudential rules, could be higher in comparison with the level of the participation deduced form the own funds.

Option 9: the possibility to except the credit institutions to apply the rules for limiting the large intragroup exposures if these are covered by the supervision on a consolidated base.

Applied by: France, Belgium;

Not applied by: Romania;

- Pros: the exposure of a credit institution to a single debtor could not exceed 25% of the own funds;
- Cons: Romania applies the general rule foreseen by the directive, respectively the intragroup exposure is limited to 20% of the own funds.

Option 10: the gradually application in more stages of the approaches based on internal models

Applied by: Romania, Canada, France, Italy, Germany, England, Belgium, Spain.

Not applied by: USA;

- Pros: permits the secvential implementation of the approaches based on intern models for different classes of exposures;
- Cons: the secvential implementation could create arbitrage opportunities for the credit institutions which could affect the financial stability.

Option 11: the possibility to except for some exposure classes the application of the internal moderns. In these situations, the standard approach would be applied.

Applied by: Romania, Canada, France, Italy, Germany, England, Belgium;

Not applied by: USA;

- Pros: the efforts necessary to implement the internal models are oriented to the exposures that generate risks;
- Cons: in some situations the standard approach could offer a relaxed treatment for an exposure compared with the approach based on internal models.

Option 12: the reduction of the period of using the internal models, previous to the date of requiring the approval for internal models for credit institutions that require this before 31 December 2009 and respectively, using the advanced internal models approach before 31 December 2009.

Applied by: the European Union member states;

Not applied by: USA;

- Pros: the possibility to reduce the three year term to minimum one year, for credit institutions that would apply the internal model approach before 31 December 2009;

- Cons: the option can lead to significant risks there aren't made particular analysis y the supervisory authority in the validation process of the models proposed by the credit institutions.

Option 13: the reduction of the observation period for estimating some risk parameters in implementing the internal models approach;
Applied by: England, Czech, Italy, Romania;
Not applied by: USA;

- Pros: the rigorous validation process permits the pre-meeting of the unexpected effects;
- Cons: it could be met difficulties in the validation processes coordinated by the states that realize the supervision of the mother company on a consolidated level.

Option 14: options regarding the calculation of the capital requirement for credit risk for the exposure of the portfolio of titles
Applied by: Belgium, Canada, Italy, Germany, Spain.
Not applied by: France, England, Holand, Sueden, Romania.

- Pros: the mark to market method could be applied through Value at Risk models and also through probability of default models;
- Cons: not applying this option, the significant exposures on the trading book could be modeled through the internal models approach, which are more sensitive to risk.

Option 15: options regarding the probability of non-reimbursement
Applied by: Czech, Italy, Great Britain, France;
Not applied by: Romania.

- Pros: the supervisory authority could establish a different period for defining the non-reimbursement 90 days phase in the case of exposures to corporations;
- Cons: the proposal to maintain the 90 day term as a reference for defining the non-reimbursement phase.

4. The empirical research on the considered options

We have included in the sample analyzed all the countries that have expressed their opinion regarding one of the options listed above, position considered from the data given by the National Bank of Romania. Our sample entails the following UE member states: Austria, Belgium, Czech, Cyprus, Denmark, France, Germany, Italy, Great Britain, Romania and Spain.

Taking into account the intermediary stage for applying these options it wasn't possible a detailed description of the adopted positions by the analyzed states, reason for which we have codified the options with the values 0, 1, and respectively 2, for each country considered. So, we have analyzed the content of each option and their implication from the risk point of view. We are referring to the fact that the adoption or not of the option is the expression of assuming a higher or a lower risk, from case to case. Those responses that express a higher assumed risk were codified with 2, while those attitudes that are reticent to the risk assuming were codified with 1. For those countries that didn't express their opinion we gave

0 points (Table 1).

Applying this methodology we had a sample of 11 countries UE members, to each of them being attributed the corresponding codification (0, 1 or 2) for each of the 15 options analyzed. Next, we have calculated a *risk aversion score* for each country, which entails the data regarding the 15 options analyzed. This score represents actually an average of the values registered by each country for each option. Our option was to determine the risk aversion score by applying the arithmetic average. So, the first step was to cumulate the scores obtained by each country for the 15 options analyzed:

$$PAR_j = \sum_{i=1}^{m_j} v_i$$

where:
PAR_j - risk aversion score for j country;
m_j - the maximum number of options for the j country;
v_i – the value that j country register at i option.

This score is used next to compute the risk aversion score for each country analyzed as it follows:

$$SAR_j = \frac{PAR_j}{m_j}$$

the preceding significations are maintained, and
SAR_j – represents the risk aversion score for j country.

Actually it has been realized an arithmetical average by dividing the cumulative score for each country to the number of options for which the country has expressed its opinion.

Taking into consideration the preceding methodology and the fact that the possible values for a option are 1 or 2 (the 0 value in the case that a option is not expressed doesn't affect the results) it is obviously that values registered (SAR_j) for each country by the risk aversion score could take values between 1 and 2. Because not all the countries from the sample expressed its option regarding the analyzed options, the risk aversion score is personalized for each of them.

Table 1 : The risk aversion score within the analyzed sample

States / Options	Austria	Belgium	Czech	Cyprus	Denmark	France	Germany	Italy	G. Britain	Romania	Spain
O_1	2	1	2	2	2	0	0	0	0	0	0
O_2	0	0	0	0	0	2	0	0	2	1	0
O_3	0	0	0	0	0	2	0	2	0	1	0
O_4	0	0	0	0	0	0	0	0	1	1	0
O_5	0	0	1	0	0	2	0	2	1	1	0
O_6	0	0	0	0	0	0	0	0	2	1	0
O_7	1	2	0	0	0	2	0	0	2	2	0
O_8	1	2	0	0	0	2	0	0	2	1	0
O_9	0	0	0	0	0	0	0	0	0	1	0
O_{10}	0	1	0	0	0	1	1	1	1	1	1
O_{11}	0	2	0	0	0	2	2	2	2	2	2
O_{12}	2	2	2	2	2	2	2	2	2	2	2
O_{13}	0	0	2	0	0	0	0	2	2	0	0
O_{14}	0	0	0	0	0	2	0	0	2	2	0
O_{15}	0	0	2	0	0	2	0	2	2	1	0
PAR	6	10	9	4	4	19	5	13	21	17	5
SAR	1.5	1.67	1.80	2	2	1.90	1.67	1.86	1.75	1.31	1.67

Source: author's projection

Table 2: The rank of the countries regarding the expressed risk aversion

Country	RAS
Cyprus	2.00
Denmark	2.00
France	1.90
Italy	1.86
Czech	1.80
Great Britain	1.75
Belgium	1.67
Germany	1.67
Spain	1.67
Austria	1.50
Romania	1.31

Source: author's projection

A high risk aversion score, according to the methodology applied before signifies positions assumed by the analyzed states regarding the acceptance of significant levels of risk which implies that this manifests a low aversion towards risk. But this increase once the score's value decrease. Cyprus and Denmark are

in the extremes. Even though they have manifested the position towards a restrictive number of options (two), each time they have manifested a high risk aversion.

At the other extreme is Romania which have manifested its position for many of the options analyzed (86,67%). Its score reflects a prudential attitude because of the low score registered and implicitly the low aversion to risk. Only 30.77% of the options that Romania expressed its position are highly risky, while for the other 69.23% of the options the attitude is a prudent one.

The results reflect the reality of the Romanian economy, in the sense that prudence is one of the factors that paced the adoption process of new methods based on models. Romania is preparing at this moment the ground for the application of new models, but the traditional approach continues to be very important.

We could also see that few countries have expressed clearly the position towards the analyzed options and the ones that did it mostly are Romania, Great Britain and France. All of these, with the exception of Romania have registered a highly risk aversion score (more than 1.50).

While Austria is in the middle of the considered values (1.50), Romania is the single country below this level. All the other countries analyzed are in a highly risk aversion zone, being open to the adoption of a series of options that permit the personalization of the capital to the specific of each country, even though this means taking some risk.

5. Conclusions, perspectives and limits of the research

Even though our study is limited to the actual stadium of development of each country regarding the policies adopted, we consider that the results are useful for more reasons. The first reason is the possibility that this study offers us to analyze the general tendency registered at the sample of states analyzed (which is also limited to those countries that have expressed their position to at least one option). This tendency clearly demonstrates that the majority of the countries analyzed are opened to the adoption of new methods to determine the adequate level of capital and also to assuming new risks associated implicitly to the capital allocation process, when it comes to renounce to the standard methods. Even though are more comfortable the standard methods don't make any differentiation between the classes of risk, generating sometimes extreme situations of risk sub evaluation or over evaluation.

The approach based on internal rating models proposes a personalisation of the capital allocation, with the aim of a better correlation of the capital with the assumed level of risk. But it is obvious that this assumed task suppose a highly risk associated with the adequate capacity of correlation between risk and capital. We consider that the development of the methods based on internal models is more opportune, representing a step forward. The only problem is their correctly implementation.

Another important aspect reflected through the obtained results is the situation at the national level, respectively the incipient stage of the banking system from Romania, highlighting the opportunity of an closely attention of the actions which would be made by the supervisory authorities, by implementing the experiences of the advanced economies, without forgetting the national characteristics of the banking system.

We would also consider opportune reanalyzing the options considered in this study after the process of implementing the new methods to determine the level of capital required would be implemented in each country, obtaining also supplementary information about the direction to take and making possible the eventual correlations.

Regarding the definition of the regulatory capital, we propose its revision, because there is not any unitary framework used by the banking institutions. It should be introduced, as a generally rule for all the banks that implement the Basel II Accord, the unitary definition of the capital, highlighting the inclusion or not in the capital of the interim profits from the trading book, the inclusion or not in the capital of the profits realized during the financial exercise.

In determine the adequate level of capital in the context of economic crisis we should also take into consideration the cyclicity of the economic system. The risk elements (probability of default, the credit ratings' migration; the value of the assets and collaterals, etc.) are manifested with cyclicity, through positive and negative periods, from a macroeconomic and microeconomic perspective. The Directives of the Basel II Accord need an improvement in this sense, for protecting the banking capital against the negative elements of the economic cycles.

Because the internal rating models based approach was affected by the financial crisis, our proposal is to introduce some weights to the capital allocation process for the credit risk, market risk and operational risk, as an alternative to the Basel II Accord Directive.

We propose the improvement of the supervisory process of the banking activity. The supervisory institutions should be implied more actively in the activity of the commercial banks, requiring transparency in publishing the balance sheet data, the performance indicators, the control and action plans and in implementing the internal models for capital allocation. In addition, it is necessary the revision of the prudential norms applied by the banking institutions, preceded by the actualization of the supervisory and regulation banking systems.

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UNION MONETAIRE ET IMPACT DU COMMERCE BILATERAL INTRA ZONE

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Abstract. This article tries to answer empirically to the second assumption on the theory of the ZMO developed by Mc Kinnon (1963), starting from a study on a sample of country of the CFA zone. We found on gravity models to highlight the existing monetary union impact on the bilateral trade flow. The results of our estimations show a considerable reduction of the borders effects, an improvement of institutional effects, as of the effects related to the distance on intra zone trade flow. Considering the importance of institutional effects, it arises that efforts must be made to create a custom and fiscal federalism in order to avoid exogenous shocks.

JEL Classification: F15, C33, C50, O24

Keywords: gravity model, bilateral trade

1. Introduction

La mondialisation des économies, caractérisée par un élargissement de l'accès aux marchés, aux intrants, à la technologie et à l'information, est un long processus historique, considérée par beaucoup d'observateurs comme un phénomène qui ne profite qu'aux pays développés. Elle s'est imposée aux Etats africains avec des avantages, mais aussi avec des inconvénients et des risques systémiques. Face à cette situation, l'intégration économique et monétaire est de plus en plus considérée par beaucoup de chercheurs comme une stratégie pertinente pour assurer une insertion harmonieuse des économies nationales

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africaines dans le tissu économique mondial permettant ainsi aux Etats africains de tirer un meilleur profit de ce phénomène.

Ainsi, certains pays de l'Afrique de l'Ouest et du Centre, conscients de cette réalité, ont amorcé, après les indépendances, des processus d'intégration avec, notamment, la mise en place de communautés économiques et d'unions monétaires dans des espaces communs comme la zone franc. C'est dans ce contexte que les pays de l'Afrique de l'ouest de la zone franc ont institué, en remplacement de la CEAO, l'Union économique et monétaire ouest africaine (UEMOA) et ceux de l'Afrique centrale ont mis en place la Communauté économique et monétaire de l'Afrique centrale (CEMAC) qui s'est vu dotée d'autres institutions, notamment l'Union monétaire de l'Afrique centrale (UMAC) et l'Union économique de l'Afrique centrale (UEAC). Ces tentatives d'intégration répondaient au souci de favoriser la croissance et la mobilité des facteurs. Elles visaient aussi à satisfaire un besoin d'élargissement des marchés, vue le sous dimensionnement des marchés nationaux.

En s'engageant dans un processus d'intégration, les pays de la zone franc renoncent au taux de change comme moyen de rétablissement de l'équilibre, suite à un choc asymétrique. Un des critères permettant de définir une zone monétaire optimale est la mobilité des facteurs. Mundell (1961), un des premiers théoriciens des zones monétaires optimales, soutient qu'une forte mobilité des facteurs et/ou une forte flexibilité des prix et des salaires peuvent minimiser les coûts liés à l'abandon de cet instrument de correction des déséquilibres. Pour Mc Kinnon (1963), le degré d'ouverture des économies fait baisser les coûts liés à l'abandon du taux de change comme instrument de politique économique.

Plusieurs études portant sur la relation entre union monétaire et commerce ont montré que l'adhésion à une monnaie unique intensifie les échanges commerciaux entre pays membres. Cependant l'examen des données de commerce montre que les pays de la zone Franc CFA commercent relativement peu avec les autres pays de la zone. La part du commerce intra-régional représente moins de 10% du commerce total des pays de l'UEMOA (9,47% en moyenne sur la période 1995-99) et moins de 3% pour les pays de la CEMAC (Lochard, 2005). On peut ainsi penser que les accords d'intégration n'ont pas réellement contribué à accroître le commerce intra-régional.

Cette étude porte sur l'impact d'une union monétaire sur le commerce bilatéral intra zone entre les différents pays constituant la zone franc. Jusque là, les principaux travaux de recherche portant sur le thème ont utilisé le modèle de gravité ; les estimations ayant été effectuées avec la méthode des moindres carrés ordinaires ou en panels.

Notre approche combine l'approche classique du modèle gravitationnel mais repose principalement sur la méthode de Blanchard et Quah (1989), et est complété par les modèles d'état mesure. Nous utilisons le modèle VAR structurel. L'originalité de cette approche réside dans le fait que nous tentons d'analyser l'effet des chocs de politiques commerciales de chaque pays.

L'identification des chocs de production, de demande réelle, de prix, nous permet de mesurer l'intensité de l'impact d'un choc dans un pays non spécifié, dans tous les autres pays de la zone franc. De plus, l'analyse des coûts et bénéfices de la participation de chaque pays de la zone monétaire dépendra de l'intensité avec laquelle les chocs des prix et de l'offre sont corrélés entre pays, et de leur degré de similarité macroéconomique.

L'état du commerce intra régional dans la zone CFA

Les échanges intra zone sont très faibles et très erratiques dans la zone CFA. Sur l'ensemble de la période 1981–1999, la part du commerce intra-régional est passée de 8,5% à 11% pour l'UEMOA et de 2,47 % à 2,17 % pour les pays de la CEMAC. La tendance est la même pour le commerce inter zone. La zone UEMOA et la zone CEMAC commercent relativement peu entre elles ; les échanges entre les pays de l'UEMOA et de la zone CEMAC s'élèvent à 11,90 % en 1999 et ceux entre les pays de la CEMAC et de la UEMOA est de seulement 3,34 % la même année. Cependant, le commerce intra régional de ces pays est le plus souvent soutenu par un ou deux pays dont le poids économique dans la zone est le plus élevé. C'est ainsi que le Sénégal et la Côte d'Ivoire sont les principaux exportateurs vers les autres pays de l'UEMOA (14% de leurs exportations totales en 1999 sont destinées aux autres pays membres) et les pays enclavés du Sahel (Burkina Faso, Mali et Niger) sont ceux qui importent le plus des pays de l'UEMOA (entre 20% et 25% en 1999). Dans la zone CEMAC, les principaux importateurs sont la République Centrafricaine et le Tchad (avec respectivement 15% et 22% des importations totales en 1999) et le principal exportateur est le Cameroun avec seulement 6% d'exportations intra-régionales (Lochard, 2005).

2. Revue sélective de la littérature

Face à la nouvelle structure du système monétaire international, les pays en quête de stabilité économique réelle et monétaire optent de plus en plus pour des solutions intermédiaires, compromis entre régime de change fixe et flexible. L'union monétaire en tant que « solution mixte » paraît être une bonne alternative. Selon Mundell, c'est l'une de celles qui sont compatibles avec l'ouverture soudaine et importante des marchés aux flux de capitaux. En outre, elle présente de nombreux avantages pour les pays membres : augmentation des relations commerciales, diminution des coûts de transaction et des mouvements spéculatifs, réduction de l'incertitude, et des externalités négatives entre pays de la zone, etc. C'est ainsi que certaines régions économiques intégrées optent pour la mise en place d'une fixité régionale parfaite par rapport à une monnaie unique de référence, également flexible vis-à-vis des autres devises (comme c'est le cas pour l'Union Monétaire Européenne). D'autres régions telles que la zone CFA, s'accommodent davantage d'une union monétaire ancrée sur une monnaie clé (dollar, yen ou euro). Cependant, cette option s'accompagne de contraintes liées à l'adoption de changes fixes par chacun des pays de la région, avec comme conséquence la perte d'indépendance de la politique monétaire, orientée en fonction de la situation globale de la zone.

Selon Mc Kinnon (1963), les coûts liés à l'abandon du taux de change comme instrument de politique économique diminuent en fonction du degré d'ouverture des économies (mesuré par le ratio des échangeables sur les non échangeables) et de l'importance de leurs échanges réciproques. Plus le degré d'ouverture d'un pays est important, plus la transmission d'un changement des prix mondiaux sur les prix relatifs internes n'est probable. Cela induit que l'illusion monétaire tend à disparaître : la baisse des revenus réels devient apparente et les agents réclament la révision de leurs revenus nominaux. Il faut donc limiter les variations des taux de change pour limiter les variations de prix.

D'autre part, l'efficacité de la politique de change diminue avec le degré d'ouverture de l'économie. Dans une économie très ouverte, les coûts de production sont fortement influencés par les prix des matières premières et des consommations intermédiaires importées, celles-ci étant difficilement remplaçables par une production locale. Lors d'une dévaluation, les effets d'inflation causés par la hausse des prix des importations nécessaires se répercutent immédiatement sur les prix des autres biens et salaires et limitent les effets attendus de la dévaluation. Le taux de change est par conséquent moins efficace comme instrument d'ajustement. Par ailleurs, Mac Kinnon estime que les économies sur les coûts de transaction augmentent selon l'intensité du commerce intra zone.

Afin de mesurer l'impact de l'union monétaire sur le commerce, plusieurs auteurs ont eu recours à une équation de gravité, modèle empirique généralement utilisé pour expliquer le niveau du commerce entre deux pays. Déjà en 1962, à la suite de Ravenstein (1885) et de Young (1924), Tinbergen(1962) a utilisé ce modèle afin d'expliquer l'intensité des mouvements migratoires en fonction de la taille des nations concernées - des régions ou des villes - et de la distance qui les sépare. Les fondements théoriques de ces modèles se sont progressivement développés grâce aux travaux de Linnemann (1966), Leamer (1970, 1974), Anderson (1979), Bergstrand (1985 et 1989), Deardorff (1995), Evenett et Keller (1998).

Cette approche a longtemps été mal considérée par les spécialistes d'économie internationale à cause de son manque de fondement microéconomique même si elle donnait de bons résultats empiriques pour expliquer les flux d'échanges bilatéraux, meilleurs que les modèles de Ricardo et d'Heckscher-Ohlin qui distinguent les pays par certaines caractéristiques structurelles, sans les localiser pas dans un espace géographique. Les nombreux auteurs qui emploient ce modèle s'accordent pour dire que les facteurs déterminants du commerce bilatéral sont la distance, les niveaux de revenu et la taille du pays (Rose, 2001). D'après les spécifications de ces modèles, on s'attend à un effet positif du revenu, et un effet négatif de la distance, tandis que les variables prix et taux de change possèdent un effet positif si les prix du pays exportateur sont inférieurs à ceux du pays importateur. Selon Combes, Mayer et Thisse (2005), dans la version de base du modèle gravitationnel, les flux commerciaux bilatéraux sont positivement liés à la taille de chacun des partenaires et négativement affectés par le niveau des coûts de transfert. Helpman (1987) et Hummel-Levinsohn (1995) ont testé la théorie de la gravitation sur les pays de l'OCDE puis sur des données plus globales. Ils ont analysé l'impact des tailles et surtout de la dispersion sur le volume d'échange relatif. Les résultats obtenus ont montré que pour les pays de l'OCDE, la dispersion joue de façon positive et significative dans les déterminants du volume d'échange. Concernant les pays non-OCDE, les résultats sont plus mitigés puisque le coefficient de dispersion joue cette fois de façon négative. Selon ces auteurs, les équations de gravité modernes se sont affinées pour prendre en compte un effet frontière indépendant de la distance (coûts de transports ou droits de douanes).

Frankel estime l'équation gravitationnelle pour les années 1967, 1970, 1975, 1980, 1985, 1987, 1990, 1992 et 1994. Son étude sur les échanges de marchandises porte sur 63 pays (soit 1953 observations) industrialisés ou non. Frankel effectue une régression sur chacune des neuf années puis sur l'ensemble des années en utilisant l'économétrie des panels. Il en conclut que l'appartenance

de deux pays à une frontière commune, une même langue et un passé historique augmentent leurs échanges commerciaux.

L'une des principales utilisations du modèle gravitationnel a été celle faite par Rose (2000) et Engel et Rose (2001). Rose (2001) en utilisant l'indice herfindahl, a montré dans une étude effectué sur les zones monétaires communes, que les pays appartenant à une union monétaire sont plus ouverts et plus spécialisés que ceux qui ont leur propre monnaie. Il utilise le modèle gravitationnel du commerce international pour évaluer l'effet de l'adhésion à une monnaie unique sur l'intensité des échanges commerciaux, en gardant fixes plusieurs autres déterminants des échanges extérieurs. Les données portent sur plus de 150 pays (dépendances, territoires, départements d'outre-mer, colonies, etc., appelés simplement « pays »). D'après les résultats obtenus, il apparaît, d'une part, que l'éloignement de deux pays réduit les échanges, alors que l'augmentation de la « masse économique » (évaluée d'après le PIB réel et le PIB par habitant) les intensifie. D'autre part, les estimations obtenues indiquent que l'utilisation d'une même monnaie augmente les échanges bilatéraux. Ces résultats sont semblables à ceux obtenus par le même auteur dans une étude menée en 2000 sur des données comparables.

3. Méthodologie

3.1. Modèle théorique de gravité

L'analyse empirique est basée sur une forme augmentée du modèle de gravité traditionnel. L'utilisation de ce modèle augmenté permet de cerner l'effet de la distance et de l'appartenance à une même zone monétaire sur l'intensité des échanges commerciaux entre pays membres de la zone CFA. Cette distance est habituellement mesurée entre les centres économiques ou les capitales des deux pays considérés. Formellement, l'équation de gravité, sous sa forme la plus simple, est donnée par :

$$X_{ij} = A\frac{Y_i Y_j}{D_{ij}} \qquad (1.1)$$

où *Xij* représente la valeur des flux de commerce (par exemple les exportations) entre un pays *i* et un pays *j*, *Y* leur revenu national, *Dij* une mesure de la distance entre ces pays et *A* un coefficient de proportionnalité. Elle est généralement estimée sous forme logarithmique. En plus des variables traditionnelles de PIB et de distance, différentes variables ont été ajoutées à cette formulation de base afin, notamment, de capter certaines spécificités de la relation bilatérale : le partage d'une frontière terrestre, l'effet des pays pétroliers et cotonniers. La variable de PIB par habitant a également été introduite pour mesurer le niveau de développement de chacun des pays, car on suppose qu'au fur et à mesure qu'un pays se développe, il tend à se spécialiser davantage et à commercer plus (Frankel, 1997). L'effet de l'union monétaire sur le commerce est mesuré à l'aide de la méthode utilisée dans l'article de Rose (2000) qui introduit dans l'équation de gravité traditionnelle une variable indicatrice qui prend la valeur 0 pour des pays qui ont leur propre monnaie, et la valeur 1 pour des pays membres d'une union monétaire.

L'équation de gravité estimée est la suivante :

$$Log(XIJCOR_{IJ}) = \alpha_0 + \alpha_1 Log(GDP_i * GDP_j) + \alpha_2 Log(GDPT_i * GDPT_j) + \alpha_3 Log(D_{ij}) + \alpha_4 UM_{ij} + \alpha_5 LAND + \alpha_6 OIL_{ij} + \alpha_7 COTON_{ij} + \varepsilon_{ij} \quad (1.2)$$

- $X_{IJ}COR_{ij}$ est le flux des exportations entre les pays i, et j à la période t,
- GDP représente le PIB global réel,
- GDPT est le PIB réel par tête,
- Dij est la distance entre i et j, provenant du site du CEPII
- UM est une variable muette qui vaut 1 lorsque i et j partagent la même zone monétaire. Elle est décomposée en UMOA et UDEAC pendant la période de 1980 à 1993, et en UEMOA et CEMAC sur la période de 1994 à 2000.
- LAND est une variable muette qui vaut 1 si i et j partagent une frontière.
- OIL est une dummy qui prend en compte les pays pétrolifères,
- COTON est une dummy qui prend en compte les pays cotonniers
- ε_{ij} est le terme d'erreur.

Les données utilisées pour estimer notre modèle gravitationnel proviennent du site du CEPII.

4. Interprétation des resultats

4.1. Le modèle de gravite

L'équation de gravité augmentée a été estimée sur données de panel en utilisant les MCG sans effets avec correction d'hétéroscédasticité. L'estimateur utilisé est PCSE (Panel Cross Section Error). Les résultats obtenus ont été plus robustes que ceux obtenus avec les MCG avec effets fixes et aléatoires. L'échantillon comporte 2358 observations de 1980 à 2002. La variable dépendante est le flux des exportations. L'échantillon a été divisé en deux sous-périodes. L'intérêt de ce découpage est double. Dans un premier temps, il permet de prendre en compte l'effet des programmes d'ajustements structurels sur la période 1980–93 ainsi que les effets de la dévaluation compétitive survenue sur la période 1994–2000. Dans un second temps, l'intérêt du découpage tient à l'importance de l'analyse des effets institutionnels. En effet, entre 1980 et 2000, il y a eu un changement dans les institutions dans la zone CFA avec l'avènement de l'UEMOA et de la CEMAC. Les résultats de notre estimation sont présentés dans les tableaux 1, 2 et 3.

Tableau 1 : Estimation du modèle gravitationnel sur la période de 1980 à 1993

Dependent Variable: LOG(XIJCOR)
Method: Pooled Least Squares
Cross-sections included: 128
Cross-section weights (PCSE) standard errors & covariance (no d.f. correction)

Variable	Coefficient	Std. Error	t-Statistic	Prob.
LOG(GDPT*GDPTJ)	0.013992	0.035568	0.393402	0.6941
LOG(GDP*GDPJ)	1.615040	0.032530	49.64756	0.0000
LOG(DIJ)	-0.313629	0.044400	-7.063712	0.0000
CEMAC	1.189252	0.122967	9.671322	0.0000
UEMOA	3.103593	0.107086	28.98220	0.0000
LAND	1.126699	0.049398	22.80879	0.0000
OIL	0.324932	0.051422	6.318905	0.0000
COTON	-0.138655	0.053643	-2.584746	0.0098
C	-69.45806	1.264201	-54.94226	0.0000
R-squared	0.943751	Akaike info criterion		3.269740
Adjusted R-squared	0.943421	Schwarz criterion		3.304048
Log likelihood	-2230.772	F-statistic		2854.389
Durbin-Watson stat	0.779621	Prob(F-statistic)		0.000000

Source: estimations des auteurs

Tableau 2 : Estimation du modèle gravitationnel sur la période de 1980 à 2002

Dependent Variable: LOG(XIJCOR)
Method: Pooled Least Squares
Cross-section weights (PCSE) standard errors & covariance

Variable	Coefficient	Std. Error	t-Statistic	Prob.
LOG(GDPT*GDPTJ)	0.077341	0.027570	2.805197	0.0051
LOG(GDP*GDPJ)	1.446936	0.025627	56.46141	0.0000
LOG(DIJ)	-0.430591	0.036104	-11.92646	0.0000
CEMAC	1.066667	0.097013	10.99506	0.0000
UEMOA	3.031197	0.086999	34.84180	0.0000
LAND	1.029130	0.040611	25.34100	0.0000
OIL	0.620506	0.050805	12.21356	0.0000
COTON	-0.035969	0.050574	-0.711225	0.4770
C	-62.23012	1.030805	-60.37040	0.0000
R-squared	0.928660	S.D. dependent var		8.208067
Adjusted R-squared	0.928417	Akaike info criterion		3.510815
Log likelihood	-4130.251	Schwarz criterion		3.532821
Durbin-Watson stat	0.649611	F-statistic		3822.238
Mean dependent var	3.244591	Prob(F-statistic)		0.000000

Source: estimations des auteurs

Tableau 3 : Estimation du modèle gravitationnel sur la période de 1994 à 2002

Dependent Variable: LOG(XIJCOR)
Method: Pooled Least Squares
Cross-section weights (PCSE) standard errors & covariance

Variable	Coefficient	Std. Error	t-Statistic	Prob.
LOG(GDPT*GDPTJ)	0.306791	0.081800	3.750511	0.0002
LOG(GDP*GDPJ)	0.177142	0.037060	4.779879	0.0000
LOG(DIJ)	-1.722398	0.143974	-11.96325	0.0000
CEMAC	-0.907120	0.263532	-3.442161	0.0006
UEMOA	1.723006	0.221905	7.764623	0.0000
LAND	1.431575	0.197897	7.233932	0.0000
OIL	1.029275	0.224676	4.581159	0.0000
COTON	-0.945737	0.205389	-4.604605	0.0000
C	0.306791	0.081800	3.750511	0.0002
R-squared	0.432972	Mean dependent var		-0.061212
Adjusted R-squared	0.428922	S.D. dependent var		3.080335
F-statistic	106.9014	Sum squared resid		5310.281
Prob(F-statistic)	0.000000	Durbin-Watson stat		0.272418

Source: estimations des auteurs

4.1.1. La période 1980 - 1993

Cette phase correspond à la période d'application des programmes d'ajustement structurels dans les pays de la zone CFA, suite aux déséquilibres macroéconomiques. Au vu des résultats obtenus (Tableau 1), les estimations effectuées sur la période 1980-993 sont assez robustes. Le pouvoir explicatif du modèle est de 94,3 %, et le modèle est globalement significatif. Toutes les variables, excepté le PIB par tête, sont significativement différentes de zéro. Les estimations obtenues sont conformes aux résultats empiriques obtenus dans les travaux antérieurs. L'éloignement de deux pays réduit les échanges de 0,73 %, tandis que l'augmentation du PIB réel et du PIB par habitant les intensifie. Le partage d'une frontière commune est également un des éléments déterminants qui explique l'accroissement des échanges bilatéraux. Le PIB et les variables muettes union monétaire (CEMAC, UEMOA) et frontière commune (Land) contribuent le plus à l'augmentation des flux des exportations. Les pays de la zone ayant une frontière commune commercent trois fois plus que les autres pays. Par ailleurs, les résultats montrent que les échanges bilatéraux augmentent dans la zone UEMOA (ex CEAO) de 22,27 fois et dans la zone CEMAC (ex UDEAC) de 3,28 fois. En d'autres termes, le commerce dans la zone UEMOA est 6,78 fois plus intense que dans la zone CEMAC. L'analyse des statistiques du FMI confirme les résultats obtenus. Pendant cette sous-période, la part du commerce intra zone dans le commerce total de l'UEMOA est plus importante que dans la zone CEMAC. Celle-ci est comprise entre 8 et 11 % dans l'UEMOA tandis que dans la zone CEMAC elle fluctue entre 0,90 et 3,51 %. Au vu de ces résultats, l'on peut affirmer que l'objectif de la CEAO qui était, entre autres, de favoriser les échanges entre ces pays en réponse aux problèmes de débouchés a été atteint.

Les pays producteurs de pétrole commercent davantage entre eux que ceux producteurs de coton. Durant la sous période 1980–93, les échanges entre les pays producteurs de pétrole augmentent de 1,38 %, tandis que dans ceux producteurs de coton, elles augmentent de 0,87 %. Ceci s'explique par la chute des prix à l'exportation des matières premières agricoles (coton notamment) durant cette période, suite à la détérioration des termes de l'échange et des politiques de dévaluation compétitive menées par les pays voisins n'appartenant pas à la zone CFA.

4.1.2. La période 1994 -2002

Pendant la sous-période 1994-2001, nous ajoutons au modèle gravitationnel les variables indicatrices CEMAC, UEMOA, LAND, OIL et COTON pour tenir compte de l'effet des différentes zones monétaires, des frontières et des pays producteurs de pétrole et de coton de la zone sur les échanges bilatéraux. La qualité de l'ajustement évaluée par le coefficient de détermination R^2 indique que 43 % des fluctuations des flux des exportations sont expliqués par le modèle. Tous les coefficients associés aux variables estimées sont significativement différents de zéro. Le modèle est globalement significatif. L'introduction des variables LAND, OIL et COTON dans le modèle montre que le flux des exportations n'est pas seulement expliqué par les variables traditionnelles du modèle de gravité. Les échanges augmentent de 4,17 % plus dans les pays partageant une frontière commune que dans les autres pays de la zone et l'effet de la distance sur la variable exogène diminue de moitié (Tableau 3).

Par ailleurs, le PIB des pays i et j explique positivement les flux commerciaux entre eux. Lorsque le PIB augmente de 1 %, le flux des exportations s'accroît de 0,1 %. Cependant, comparé à la sous période 1980-93, cet effet est faible. La crise politique et économique qui sévit dans les pays de la zone CFA, depuis 1999, a entraîné un nouveau ralentissement de l'économie des pays membres. L'introduction des variables muettes CEMAC et UEMOA indique que l'appartenance à une zone monétaire commune agit positivement sur les échanges bilatéraux. Toutefois, comparé à la sous période 1980-93, cet effet diminue : les pays de la zone UEMOA commercent 13,87 fois plus que les pays de la zone CEMAC.

Toutefois, l'effet des zones monétaires n'est pas identique. On pourrait en conclure que la constitution des unions monétaires et économiques dans les deux zones n'a qu'un effet négligeable sur les échanges bilatéraux intra zone. Au delà de la facilitation de la circulation des biens et services, la création de ces institutions a comme objectif de catalyser les exportations en général et le commerce intra zone en particulier. Le commerce bilatéral entre les pays producteurs de pétrole s'accroît de 2,8 % tandis que l'accroissement est de 0,38 % dans les pays producteurs de coton.

Ces résultats dissimulent la faiblesse du commerce intra zone ; selon le FMI, le commerce intra UEMOA est toujours freiné par d'importantes barrières non tarifaires (normes nationales, restrictions quantitatives sur certaines importations, discrimination de traitement des produits nationaux et régionaux, etc.). Quant à la zone CEMAC, le tarif préférentiel adopté en 1994 sur le commerce intra-communautaire est appliqué de manière inégale.

4.1.3. La période 1980- 2002

Sur la période globale 1980-2002, les estimations obtenues (Tableau 2) montrent que le flux des exportations est expliqué à 92,86 % par le modèle gravitationnel. Les coefficients de toutes les variables, excepté celui de la variable coton sont significatifs. Tout comme dans les sous périodes, la contribution de la variable union monétaire de la zone UEMOA à l'augmentation des flux d'exportation est la plus importante. Ceci découle du fait que le processus d'intégration dans la zone a renforcé la libre circulation des biens, des services et des personnes, tandis que dans la zone CEMAC, malgré l'institution d'une union douanière, il existe toujours des barrières institutionnelles qui entravent le commerce bilatéral. Dans une étude plus approfondie et comportant des données plus récentes, Carrère (2005) montre que les pays de l'UEMOA et de la CEMAC commercent davantage au sein de chaque union qu'avec d'autres pays, toutes choses égales par ailleurs, et que ces effets sont importants (Lochard, 2005). On en déduit que l'utilisation d'une monnaie commune a une plus forte incidence sur les échanges extérieurs de la zone UEMOA que de la zone CEMAC. La taille de l'économie mesurée par le PIB est la seconde variable qui a un effet significativement positif sur le flux des exportations. La distance qui sépare deux pays a un effet négatif sur les échanges bilatéraux. Les résultats obtenus sont conformes à la littérature même si les coefficients trouvés dans notre estimation diffèrent. Comme on peut le constater dans les sous périodes considérées, les pays producteurs de pétrole commercent davantage entre eux que les pays producteurs de coton, certainement parce que la plupart de ces pays sont enclavés.

5. Conclusions et recommandations de politiques économiques

Cet article tente de répondre empiriquement à la deuxième hypothèse sur la théorie des ZMO développée par Mc Kinnon (1963), à partir d'une étude menée sur un échantillon constitué des 12 pays de la zone franc, sept pays de la zone UEMOA et cinq pays de la zone CEMAC . Il s'appuie sur les atouts des modèles de gravité pour mettre en évidence l'impact des unions monétaires existantes sur le flux de commerce bilatéral.

Les résultats empiriques des modèles gravitationnels mettent en évidence :

- une augmentation de 120 % du commerce bilatéral provenant de l'effet frontière dans le temps ;
- une diminution de l'effet distance dans le temps qui fait que les gains provenant de cette diminution font gagner 62.4 % de flux de commerce intra zone supplémentaire ;
- une accentuation des effets institutionnels de 80% sur le flux de commerce bilatéral intra zone.

En se fondant, d'une part sur les modèles gravitationnels, cette étude met en évidence un effet important des zones monétaires sur le niveau du commerce bilatéral intra zone. Il est donc indispensable de renforcer l'intégration économique en adoptant des mesures permettant à chaque pays membre de bénéficier des avantages spécifiques de son adhésion à la zone monétaire. La construction d'un fédéralisme douanier et d'un fédéralisme budgétaire pourraient être envisagée dans chaque union (UEMOA et CEMAC) pour contrecarrer les chocs exogènes nocifs au développement des échanges intra zone.

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ANEXES

Tableau 4 : Sources et disponibilité des variables

Abréviation	Description	Période	Source	Type
XIJ	Flux de commerce bilatéral	1980-2000	World Bank Data Base	Endogène
GDPi	Niveau du PIB du pays i	1980-2000	World Bank Data Base	Exogène
GDPj	Niveau du PIB du pays j	1980-2000	World Bank Data Base	Exogène
GDPTi	Niveau du PIB par tête du pays i	1980-2000	World Bank Data Base	Exogène
GDPTj	Niveau du PIB par tête du pays j	1980-2000	World Bank Data Base	Exogène
Dij	Distance entre les pays i et j	1980-2000	CEPII	Exogène
LAND	Frontière entre les pays i et j	1980-2000	World Bank Data Base	Exogène
UEMOA	Pays appartenant à l'UEMOA	1980-2000	World Bank Data Base	Exogène
CEMAC	Pays appartenant à la CEMAC	1980-2000	World Bank Data Base	Exogène
OIL	Côte d'Ivoire, Cameroun, Congo, Gabon	1980-2000	World Bank Data Base	Exogène
COTON	Bénin, Burkina-Faso, Togo Centrafrique, Mali, Niger, Tchad	1980-2000	World Bank Data Base	Exogène

Tableau 5 : Commerce bilatéral par paire dans la zone UEMOA et CEMAC

UEMOA	Montant en Mld. de $	CEMAC	Montant en Mld. de $
MALI TO BENIN	5,58975854	TCDTOGAB	0,06157383
BENIN TO BURKINA	19,3504369	RCATOCGO	0,441544
MALI TO NIGER	30,13219398	GABTORCA	3,87506151
NIGER TO SENEGAL	37,02855788	CGOTORCA	6,9671015
TOGO TO SENENEGAL	103,9322312	TCDTOCGO	6,998766
NIGER TO BENIN	111,5991176	TCDTORCA	27,8211811
BENIN TO SENEGAL	189,2139994	GABTOCGO	56,578946
TOGO TO BURKINA	209,826437	RCATOCMR	298,391508
BENIN TO TOGO	239,489703	TCDTOCMR	329,730869
BENIN TO COTE D IVOIRE	591,040127	CMRTOCGO	436,63781
COTE D IVOIRE TO NIGER	853,7939	CMRTOGAB	659,557647
SENEGAL TO MALI	951,1990167	TOTAL	**1827,06201**
COTE D IVOIRE TO TOGO	1094,246716		
SENEGAL TO COTE D IVOIRE	1615,276527		
COTE DIVOIRE TO BURKINA	2788,337404		
MALI TO COTE D IVOIRE	3331,885322		
TOTAL	**12171,94145**		

Liste des abbreviations

SIGLE	LIBELLE
BCEAO	Banque Centrale des Etats de l'Afrique de l'Ouest
BEAC	Banque des Etats de l'Afrique Centrale
CEMAC	Communauté Economique et Monétaire de l'Afrique Centrale
CEPII	Centre d'Etudes Prospectives et d'Informations Internationales
CFA	Communauté (Coopération) Financière d'Afrique
FMI	Fonds Monétaires International
MCG	Moindres Carrées Généralisées
PAS	Programme d'Ajustement Structurel
PAZF	Pays de la Zone Franc
PECO	Pays d'Europe Centrale et Orientale
PIB	Produit Intérieur Brut
PPTE	Pays Pauvres Très Endettés
RCA	République Centre Africaine
UDEAC	Union Douanière et Economique de l'Afrique Centrale
UEAC	Union Economique de l'Afrique Centrale
UEMOA	Union Economique et Monétaire Ouest Africaine
UNCOMTRADE	Base de données sur le commerce des Nations Unies
UMAC	Union Monétaire de l'Afrique Centrale
ZMO	Zone Monétaire Optimale

FINANCIAL STATEMENTS ANALYSIS AS A TOOL FOR DECISION-MAKING: CASE OF "NEMETALI"

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Abstract. In this article we sought to demonstrate how financial statements analysis can be implemented as a tool for a sound decision-making. For this purpose we have selected "Nemetali" as a small business company. The data used for the empirical analysis cover the period of 2001-2005 and were derived from company's financial statements. Different financial techniques and methods, and financial ratios analysis were used. Detailed analysis was performed in function of finding whether there was a necessary reconstruction of business activities. Results showed that white marble production line and lamp-shade segment should be closed. Composition of assets and liabilities were confirmed that they need to be changed. The study also confirmed that financial reporting should not be only for tax oriented, but for the company itself.

JEL Classification: M490, G310, G320
Keywords: financial statements, financial ratios, decision-making

1. Introduction

In generally, different countries use different ways in preparing and reporting financial statements. Their reporting quality is evolving as evolves their economical, financial, juridical, cultural, and social requirements. The recent trends are for practices unification with purpose of decreasing costs and increasing benefits for decision makers. Those trends are addressed to International Accounting Standards (IAS) and International Financial Reporting Standards (IFRS). Thus, implementation correctly of IAS and IFRS is very progressive step and challenge for Macedonia and its financial system, and precondition for country economic integration.

Macedonia gained its independence peacefully from Yugoslavia in 1991. Since the Stabilization and Association Agreement in April 2001, the economic orientation of Macedonia has moved increasingly toward Western Europe. Consequently of economic integration, accounting harmonization has become even more important after the European Union (EU) granted Macedonia candidate

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status on December 17, 2005. Setting IAS as obligatory for large and medium size commercial entities has improved quality of financial reporting, but there is still open window to work in practice. In many cases, financial reporting is looked as mandatory-tax oriented and not for helping decision-making.

This article is organized as follows: Macedonian accounting and financial reporting statutory framework. Theoretical framework concerning financial statements analysis. Financial statements analysis – Case of "Nemetali". Analysis and discussion of results. Conclusions and recommendations. References/ Bibliography.

2. Macedonian accounting and financial reporting statutory framework

According to Company Law (2004, Article 469), each commercial entity shall be obliged to keep accounting records and submit annual accounts in a manner determined by this law, and the accounting regulations. Each large and medium size commercial entity, commercial entities specified by a law, as well as commercial entities performing banking activities, insurance activities, commercial entities listed on the Stock Exchange and commercial entities, the financial statements of which are included in the consolidated financial statements of the above mentioned commercial entities, shall be obliged to prepare and submit financial statements in accordance with the adopted International Accounting Standards, published in the "Official Gazette of the Republic of Macedonia". The Minister of Finance shall prescribe special regulations for the keeping of accounts.

The format and contents of the balance sheet and income statement prescribed by the Minister of Finance applies to large and medium enterprises. Simplified balance sheet and income statement apply to small enterprises. Accounting regulation is driven by the Ministry of Finance, which also regulates and collects taxes. On the other hand, implementation of International Accounting Standards (IAS) and International Financial Reporting Standards (IFRS) is not an enclosed process, but it is the standard-setting process which takes into account the needs of all accounting information users.

According to Company Law (2004, Article 471), each commercial entity, in accordance with the principles of proper keeping of accounts, shall keep its trade books in a manner that clearly reflects all business and legal operations and the position of its assets, liabilities, equity, revenues and expenses. The trade books shall be kept in a manner that enables any third party-expert when reviewing the trade books to gain a general overview and insight into the operations of the commercial entity, as well as the financial condition and financial results of the company. The trade books shall clearly present how all of the business transactions of the commercial entity have been commenced, conducted and completed. The commercial entity shall be obliged to keep one copy of each business letter sent. Such copy shall be identical to the original sent. The trade books shall be kept according to the double entry accounting system. Trade books, kept in accordance with the double entry system shall be the Journal, the Ledger and the Subledger records.

According to Company Law (2004, Article 472), the commercial entity shall keep their trade books in the Macedonian language, using Arabic digits and values expressed in denars. All data registered in the trade books shall be comprehensive and complete, prepared in a timely manner, up-dated as necessary and presented chronologically, or shall accurately reflect the time sequence of their occurrence.

The trade books shall be kept on the basis of reliable accounting documents. Trade books kept under the double entry accounting system shall be kept by applying single accounts as prescribed by the Chart of Accounts. The Chart of Accounts shall prescribe the accounts that are obligatory for all trade companies, unless otherwise provided by law. The commercial entity shall, according to its needs, break down the accounts from the Chart of Accounts into analytical accounts (in its Subledger Chart of Accounts). The Minister of Finance shall prescribe the Chart of Accounts.

IAS/IFRS require retrospective accounting so that the correction of an error is excluded from the determination of profit or loss for the period in which the error is discovered. Such inconsistencies result in difficulties for preparers and auditors, who may find themselves unable to comply with both domestic law and international standards (Hegarty *et al.,* 2004). As we can see, according to Macedonian Company Law, regulation in line of preparing and presentation of financial statements is more a formal than essential a guide. It doesn't mention others criteria like International Accounting Standard 1 for fairly presentation, going concern, accrual basis, consistency of presentation, materiality and aggregation, comparative information, etc. Those are fulfilled in Macedonian Law on Accountancy. But, oriented according two laws, i.e. Company Law and Law on Accountancy can be an obstacle for companies in line of preparing and presentation of financial statements.

The financial statements must "present fairly" the financial position, financial performance and cash flows of an entity. Fair presentation requires the faithful representation of the effects of transactions, other events, and conditions in accordance with the definitions and recognition criteria for assets, liabilities, income and expenses set out in the Framework. The application of IFRSs, with additional disclosure when necessary, is presumed to result in financial statements that achieve a fair presentation (IAS 1.13).

IAS 1 requires that an entity whose financial statements comply with IFRSs make an explicit and unreserved statement of such compliance in the notes. Financial statements shall not be described as complying with IFRSs unless they comply with all the requirements of IFRSs (including Interpretations) (IAS 1.14). Inappropriate accounting policies are not rectified either by disclosure of the accounting policies used or by notes or explanatory material (IAS 1.16). IAS 1 acknowledges that, in extremely rare circumstances, management may conclude that compliance with an IFRS requirement would be so misleading that it would conflict with the objective of financial statements set out in the Framework. In such a case, the entity is required to depart from the IFRS requirement, with detailed disclosure of the nature, reasons, and impact of the departure (IAS 1.17-18).

An entity preparing IFRS financial statements is presumed to be a going concern. If management has significant concerns about the entity's ability to continue as a going concern, the uncertainties must be disclosed. If management concludes that the entity is not a going concern, the financial statements should not be prepared on a going concern basis, in which case IAS 1 requires a series of disclosures (IAS 1.23). IAS 1 requires that an entity prepare its financial statements, except for cash flow information, using the accrual basis of accounting (IAS 1.25).

The presentation and classification of items in the financial statements shall be retained from one period to the next unless a change is justified either by a

change in circumstances or a requirement of a new IFRS (IAS 1.27). Each material class of similar items must be presented separately in the financial statements. Dissimilar items may be aggregated only if they are individually immaterial (IAS 1.29).

According to Macedonian Law on Accountancy (Article 27), assessment of the accounting statement items shall be done by applying the assessment rules defined in the Entity's accounting policy, which are in line with this Law, the accepted accounting principles, standards, principles and the current accounting practice.

According to Law on Accountancy (Article 28), the basic assumptions for composing accounting statements shall be:

- constancy,
- consistency,
- keeping of records of the changes as they occur.

The general rules (criteria) of assessing the accounting statement items shall be:

- caution (carefulness), the principle of accomplishment and equal values-imparities,
- individual assessment of property and obligations,
- linkage of the balance sheet in the time,
- material meaning.

3. Theoretical framework concerning financial statements analysis

Many studies are done in line of measuring benefits and costs of implementing IAS/IFRS. For example Veerle (2005) analyzed arguments such as higher quality, lower cost of capital, existence of wide gap, practical and efficient in favor of complete harmonization; and cost argument, tax accounting, different user needs compliance as arguments against complete harmonization. However, preparing and reporting financial statements have evolved in recent years due to economical, financial, juridical, cultural, and social requirements. So, financial analyst should be accurate for the way how accounting information is prepared and reported. Results and their interpretations of an entity cannot be compared with entities in different industrial sectors, or in the same sector but with different size, business activity, and so on. Therefore, each entity should be analyzed in itself context.

Accounting is not an end in itself (SFAC No.1), but an information system that measures, processes, and communicates financial information about an identifiable economic entity (Needles and Powers, 2005). Accounting prepares financial statements to communicate them at internal and external users. Furthermore, financial statements will analyze decisions that are to be done or pretended to be made in the future. Financial statements serve as data source for financial analyst together with other sources.

Financial statements analysis reduces our reliance on hunches, guesses, and intuition, and in turn it diminishes our uncertainty in decision making (Bernstein and Wild, 1998). It detects the entity's economical and financial strengths and weaknesses. Therefore, financial statements analysis determines therapy that needs to the entity.

4. Financial statements analysis – Case of "Nemetali"

In this section we give a briefly description of company background. "Nemetali" is located in Tetovo (Macedonia), street 113-no.3. It is privatized in 1996 from Skopje Stock Exchange from which are bought 85% of shares. Major business activities are relying on field of lamp-shade, and extraction, processing and selling of marble, and others services. According to Law on Accountancy, the company is classified as small enterprise for period 2002-2005. But, in 2001 it has exceeded number of employees to classify as small subject.

Raw materials for lamp-shade are supplied from Slovenia, Croatia, Serbia, Macedonia, and as from Western Europe market. Raw materials for marble are supplied from own mineral-Prilep (Macedonia) and Greece, as from domestic suppliers. Own mineral from which are extracted marbles is taken with concession for 35 years.

"Nemetali" has two production departments (one for lamp-shade and one for marble processing). Production department for lamp-shade is organized in some phases, i.e. fusion and production of elements, elements assembling, finalization and packing, and controlling. Department for marble also is organized in some phases as cutting of marble blocks, tablets cutting, lustration, packing, and controlling.

If we analyze structure of material sources for period 2001-2005, we will see that increases and decreases are more expressed at tools and transportation articles which from 2000 to 2001 are increased for 3,386%. Increasing is due to technology modernization. The same article is decreased in 2002 for 71% due to disposal of old fashion tools. Decreasing of long-term assets continue in following years with soft rhythm when decreasing in 2003 is 66%, 2004 is 12%, and 2005 is 2%.

Employees are with different professional education backgrounds. For analyzed period there are a huge number of employees who are made redundant. This is due to privatization and for being more efficient. Analyzed data showed that especially from 2003, company has not been attractive in labor market. For four years alternately, sales revenue per employee had not covered costs. With other words, mixed costs for employee are roughly 50% upper than sales revenue for employee. This proportion is improved at the last year of analysis when sales revenues in yearly level increased for 16%. Fixed costs per employee are decreased due to some non material fixed expenses. Extreme disfavor ratio (sales revenue per employee/costs per employee) is worsened much more in winter season when sales revenues slumped and fixed expenses have continued to occur regardless of lower level of production.

"Nemetali" belongs in group of businesses which are not required to implement IAS and IFRS. This means that financial statements are prepared according to national General Accepted Accounting Principles (GAAP). Due to this fact, from income statement we can not obtain analytic information about sales revenue. Many of needful facts for company valuation are not presented on financial statements (Xhafa, 2005). So, we have used appendixes as relevant source information in order to get more useful information. From general revenues, we have selected revenues according production lines, i.e. marble and lam-shade. Table 1 and table 2 show analytic sales revenue. As we can see from table 1, red marble is more profitable compared with other marbles. But, sales are one side of coin, the other side is costs.

Table 1: Income statement - Marble segment (amounts in denars)

Year/ Article	Total	White marble	Red marble	Common marble
2001	17,330,321	5,199,096	10,398,192	1,733,032
2002	3,257,644	814,411	2,117,469	325,764
2003	7,357,988	1,398,018	5,592,071	367,899
2004	7,359,905	1,471,981	5,593,527	294,396
2005	8,590,776	1,116,801	6,700,805	773,170

Compare with marble segment, lamp-shade segment generates fewer sales. We have to perform scenario analysis in order to decide whether to product or not in future this product. From general income statement we prepare separately business segments report in order to see contribution of each product in term of cost and revenue. Income statement is prepared using the contribution margin rather than traditional approach. In contrast of traditional approach, contribution approach organizes costs by behavior rather by function. Moreover, the contribution approach helps managers organize data pertinent to all kinds of special decisions such as product-line analysis, pricing, use of scarce resources, and make or buy analysis (Garrison, Noreen and Brewer, 2006).

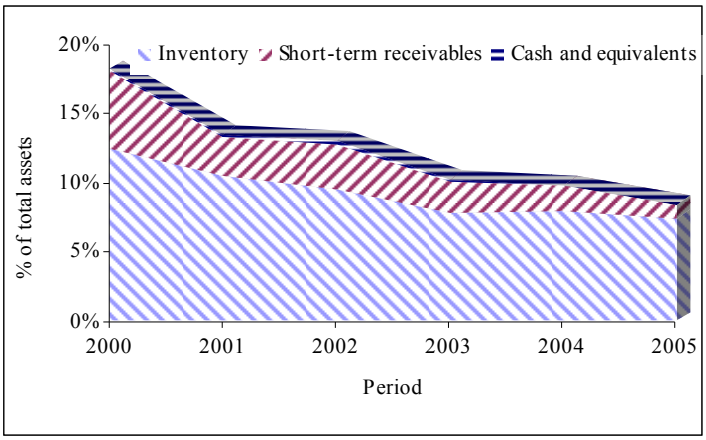
Table 2: Income statement-Lamp-shade segment (amounts in denars)

Year/ Article	Total revenues
2001	535,989
2002	66,483
2003	89,368
2004	74,342
2005	25,850

5. Analysis and discussion of results

As we can see from figure 1, the major percent of short-term assets is captured by inventory. High level of inventory is the sign of liquidity problem. Inventory turnover is very low as it is highlight in table 7. Row materials nearness is key reason why the company should reduce its inventory. High level of inventory is arrived due to unsold lamp-shade for many years.

Figure 1: Composition of short-term assets

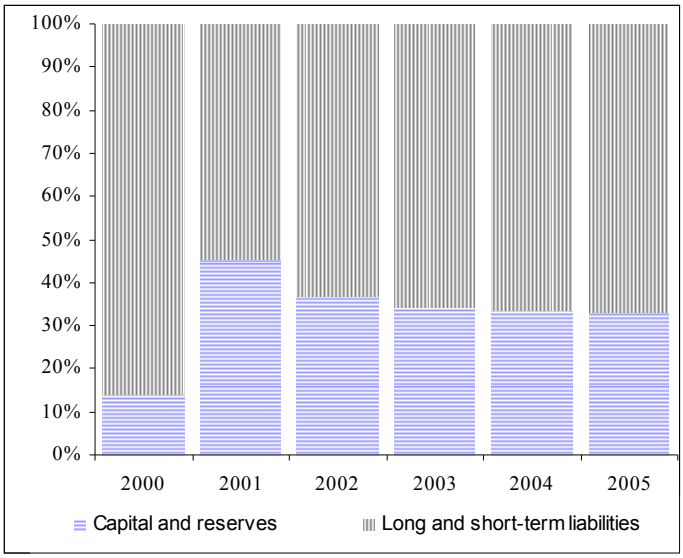


If we compare long-term assets to short-term assets, we can find that roughly 90% of assets are long-term assets. For analyzed period 2001-2005 this trend is worsen. Long-term financial investments section for analyzed period remains zero. This is not characteristic just for analyzed company, but in general and for other small and medium businesses. For example, a questionnaire realized with managers of small and medium companies in Pollog region confirmed that accessibility to financial market is difficult in terms of cost and technical difficulties. In the same questionnaire, in question if they were aware for financial market in Macedonia, major of them gave negative answers. For them is very important trade credit. Trade credit (difference between accounts payable and account receivable) is considered relevant source in business financing i.e. for small and medium businesses. Trade credit is the highest short-term financing and represents about half of short-term liabilities at trade businesses (Ciceri and Xhafa, 2005).

Figure 2: Long-term assets versus short-term assets

On the other hand, business activities of “Nemetali” are financed roughly by 60 percent debt and remain percent by capital. Even though there is no exact formula available for establishing optimal target debt and capital ratio, the empirical studies indicate that profitability, types of assets, taxes, differences across industries, uncertainty of operating income, etc. should be considered when formulating capital structure policy. However, analyzed company still is above industry norm (marble industry) in respect of debt for period 2001-2005. Long-term loan from 2000 year which has not been efficiently used, appear to be the main financing problem.

Figure 3: Capital and liabilities



As we can see from table 3 for the analyzed period 2001-2005, white and common marble has generated losses, and just red marble starting from 2003 year has started to generate profits.

Table 3: Revenues report-Marble segment-Margin contribution form (amounts in denars)

Year/ Article	2001	2002	2003	2004	2005
White marble:					
Sales	5,199,096	814,411	1,398,018	1,471,981	1,116,801
Operating variable cost	473,370	75,069	56,259	105,784	123,552
Production variable cost	1,619,235	1,317,355	2,268,702	1,652,600	1,823,361
Total variable cost	2,092,604	1,392,424	2,324,961	1,758,384	1,946,914
Total contribution margin	3,106,492	-578,013	-926,944	-286,403	-830,113
Operating fixed cost	7,171,086	3,614,167	1,900,559	1,771,477	1,715,095
Production fixed cost	1,062,986	1,114,559	987,003	811,655	851,051

Total fixed cost	8,234,072	4,728,725	2,887,562	2,583,132	2,566,146
Operating income	-5,127,580	-5,306,738	-3,814,506	-2,869,536	-3,396,259
Red marble:					
Sales	10,398,192	2,117,469	5,592,071	5,593,527	6,700,805
Operating variable cost	473,370	75,069	56,259	105,784	123,552
Production variable cost	622,783	506,675	872,578	635,616	701,293
Total variable cost	1,096,152	581,744	928,837	741,399	824,845
Total contribution margin	9,302,040	1,535,725	4,663,234	4,852,128	5,875,960
Operating fixed cost	8,963,857	4,517,708	2,375,699	2,214,346	2,143,869
Production fixed cost	531,493	557,279	493,502	405,828	425,526
Total fixed cost	9,495,350	5,074,988	2,869,200	2,620,174	2,569,395
Operating income	-193,310	-3,539,263	1,794,034	2,231,954	3,306,565
Common marble:					
Sales	1,733,032	325,764	367,899	294,396	773,170
Operating variable cost	236,685	37,534	28,130	52,892	61,776
Production variable cost	249,113	202,670	349,031	254,246	280,517
Total variable cost	485,798	240,204	377,161	307,138	342,293
Total contribution margin	1,247,234	85,560	-9,261	-12,742	430,877
Operating fixed cost	1,792,771	903,542	475,140	442,869	428,774
Production fixed cost	177,164	185,760	164,501	135,276	141,842
Total fixed cost	1,969,936	1,089,301	639,640	578,145	570,616
Operating income	-722,702	-1,003,741	-648,902	-590,887	-139,739

On the other hand, lamp-shade segment for the analyzed period 2001-2005 as it is indicated at table 4 has generated losses.

Table 4: Revenues report-Lamp-shade segment-Margin contribution form (amounts in denars)

Year/ Article	2001	2002	2003	2004	2005
Lamp-shade:					
Sales	535,989	66,483	89,368	74,342	25,850
Operating variable cost	117,042	14,126	7,403	22,996	19,716
Production variable cost	246,376	152,547	183,701	105,936	86,758
Total variable cost	363,417	166,673	191,103	128,932	106,474
Total contribution margin	172,572	-100,191	-101,735	-54,590	-80,624
Operating fixed cost	752,990	453,368	174,722	193,886	165,675
Production fixed cost	17,895	37,910	16,616	41,838	14,327
Total fixed cost	770,885	491,278	191,338	235,724	180,003
Operating income	-598,313	-591,469	-293,073	-290,314	-260,627

Furthermore, we perform scenario analyses as are shown in table 5 and table 6. As we can see there are four possible ways in our case:

1. None production line is closed. Company has losses for whole analyzed period;
2. White marble is closed. Company has losses for period 2001-2004, and just in last year (2005) for the first time generates operating income of 600,680 denars.
3. Red marble is closed. Company has losses for whole analyzed period;
4. Common marble is closed. Company has losses for whole analyzed period.

Table 5: Scenario analysis-Marble segment (amounts in denars)

Year/ Article	2001	2002	2003	2004	2005
None production line is closed	17,330,321	3,257,644	7,357,988	7,359,905	8,590,776
Total variable cost	3,674,555	2,214,372	3,630,959	2,806,922	3,114,052
Total contribution margin	13,655,766	1,043,273	3,727,029	4,552,983	5,476,724
Total fixed cost	19,699,358	10,893,014	6,396,403	5,781,452	5,706,157
Operating income	-6,043,592	-9,849,742	-2,669,374	-1,228,469	-229,433
White marble is closed:					
Sales	12,131,224	2,443,233	5,959,970	5,887,924	7,473,975
Total variable cost	1,581,950	821,948	1,305,997	1,048,537	1,167,139
Total contribution margin	10,549,274	1,621,285	4,653,973	4,839,386	6,306,837
Total fixed cost	19,699,358	10,893,014	6,396,403	5,781,452	5,706,157
Operating income	-9,150,084	-9,271,729	-1,742,430	-942,065	600,680
Red marble is closed:					
Sales	6,932,128	1,140,176	1,765,917	1,766,377	1,889,971
Total variable cost	2,578,402	1,632,628	2,702,122	2,065,522	2,289,207
Total contribution margin	4,353,726	-492,453	-936,205	-299,145	-399,236
Total fixed cost	19,699,358	10,893,014	6,396,403	5,781,452	5,706,157
Operating income	-15,345,632	-11,385,467	-7,332,608	-6,080,597	-6,105,393
Common marble is closed:					
Sales	15,597,289	2,931,880	6,990,088	7,065,508	7,817,606
Total variable cost	3,188,757	1,974,167	3,253,798	2,499,783	2,771,759
Total contribution margin	12,408,532	957,713	3,736,290	4,565,725	5,045,847
Total fixed cost	19,699,358	10,893,014	6,396,403	5,781,452	5,706,157
Operating income	-7,290,826	-9,935,302	-2,660,113	-1,215,727	-660,309

Performed scenario analysis indicates that white marble is less rentable compared with other marble products. So, table 6 shows that if white marble and lamp-shade are closed, companies would have operated with profit of 600,680 denars in 2005.

Table 6: Scenario analysis-Marble and lamp-shade segment (amounts in denars)

Year/ Article	2001	2002	2003	2004	2005
Operating income-marble	-6,043,592	-9,849,742	-2,669,374	-1,228,469	-229,433
Operating income-lamp-shade	-1,618,394	-923,789	-531,516	-534,430	-467,798
Total income	-7,661,986	-10,773,531	-3,200,890	-1,762,899	-697,231
White marble and lamp-shade are closed	-9,150,084	-9,271,729	-1,742,430	-942,065	600,680

Ratio analysis also is used in this study. A primary advantage of ratios is that they can be used to compare the risk and return relationships of firms of different sizes (White, Sondhi and Fried, 2003).

Table 7: Summary of financial ratios

Description	Years				
Liquidity analysis ratios	2001	2002	2003	2004	2005
Current ratio	0.26	0.22	0.17	0.16	0.16
Quick ratio	0.06	0.06	0.04	0.03	0.02
Accounts receivable turnover ratio	3.00	1.00	3.00	4.00	7.00
Average day's sales uncollected	116	387	142	88	54
Inventory turnover	1.56	0.87	1.14	1.25	1.00
Inventory turnover (with sales)	0.97	0.25	0.65	0.74	0.90
Average day's inventory on hand	233	420	319	293	365
Operating cycle	350	806	461	381	419
Profitability ratios					
Gross profit margin	(0.610)	(2.550)	(0.760)	(0.690)	(0.110)
Net profit margin	0.000	0.000	0.000	0.000	0.000
Total asset turnover	0.130	0.020	0.060	0.060	0.070
Return on assets	0.000	0.000	0.000	0.002	0.000
Return on equity	0.000	0.000	0.000	0.004	0.000
Financial leverage and capital structure ratios					
Debt ratio	0.550	0.630	0.660	0.670	0.670
Total debt to equity ratio	1.560	1.770	1.760	1.760	1.730
Total long-term debt to equity ratio	0.100	0.100	0.100	0.090	0.090
Financial leverage ratio	2.840	2.800	2.680	2.640	2.570
Financial leverage index	0.000	0.000	0.000	0.000	0.000
Usefulness and efficiency ratios					
Receivables turnover	76.430	11.570	26.360	58.270	687.620
Sales to inventory ratio	0.970	0.250	0.650	0.740	0.900
Fixed assets turnover	0.130	0.030	0.060	0.060	0.080
Short-term liabilities turnover	0.160	0.040	0.090	0.090	0.120

Ratio analysis showed that liquidity and profitability ratios are low enough, and there are few chances that company can survey in future years. On the other hand, the company is exposed of bankruptcy risk. Debt ratios are raised year after year and become 67% at last year. This is high percent of debt compare with industry norms.

"Nematali" is confirmed not to use efficiently its assets. A long-term and short-term ratio asset is one of these problems. Not using warehouses for alternative use, i.e. giving with rent, and high level of land which also is not have been used for alternative use are second problem.

6. Conclusions and recommendations

This study sought to demonstrate how financial statements analysis can be used as a tool for decision making and improving financial performance. The analysis was conducted based on data obtained from the published annual reports for the period 2001-2005. Based on obtained results, we recommend for "Nemetali" as follow:

- Company should install well function information reporting system which will provide information about each segment;
- Financial statements should not be only for fiscal oriented, but also for decision-making;
- Re-composition of assets and liabilities; and
- Restructure of business activity.

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LA NOUVELLE STRATEGIE DE DEVELOPPEMENT EN ALGERIE : ENJEUX ET DEFIS

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Abstract. After a calm which lasted more than two decades, a reflection is led by authorities to introduce a development policy to catch up the lost time and position the Algerian industry in structurants segments and with great potential of growth. It is about the application of a real strategy of industrial restructuring which privileges the use in common competence and favours especially the innovation. In the main of the preoccupations, we find well obviously the growth, the competitiveness and the attractiveness. So, authorities decided to react to the phenomenon of deindustrialization which made fallen the part of the industry in the GDP from 15 % to 3 %. It is necessary to agree that in front of national and international alterations Algeria which has considerable trump cards let make by contenting itself of outside without reciprocity. The new strategy is similar in fact to a new development policy which bases enter on the poles of competitiveness, spinal column of this strategy. The promotion of the poles of competitiveness which is the French declension of "clusters" or technological clusters gains(wins) all the countries and stands out as new model of economic development. The analysis of the conditions of success implies to hold(retain) the necessity of a commitment in the sectors of high technology and the necessary local link(coming together) between the worlds of the knowledge, the search(research) and the companies. These cooperations are centred on the exchanges and the mutualization of the experiences of the knowledge: research, training, advices and material, human resources and infrastructures on the basis of a voluntary and joint action of the actors who are the main regulators.

JEL Classification: E22, E23, E61

Keywords: developement strategy; Algeria

1. Introduction

Nul ne peut dire que l'économie algérienne est toujours en attente d'un projet qui puisse la sortir des politiques conjoncturelles contra ou procycliques nécessaires, mais demeurent bien entendu insuffisantes pour remettre l'économie sur un sentier de croissance soutenue et durable. La conjoncture financière

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actuelle favorable doit être sérieusement mise à profit pour aller à l'élaboration de ce projet, de ces politiques structurelles. La première réflexion concerne la nécessité de renouer avec l'ambition du pays en matière de politique industrielle.

Quelle stratégie industrielle mettre en œuvre sachant qu'elle devra se réaliser dans un contexte totalement différent des années 70. Mondialisation, ouverture et compétitivité tracent aujourd'hui le passage obligé et contraignant dans lequel le pays est appelé à évoluer. Quels objectifs à mener et sous quelles contraintes nationales et mondiales ? La question n'est pas aussi simple et demande la contribution de chaque, surtout que l'avenir du pays se joue dans l'industrie : reprendre les erreurs du passé, ne pas tenir compte des évolutions que vit l'industrie mondiale et du rythme rapide de ces évolutions, c'est forcement se diriger une nouvelle fois vers une impasse.

L'embellie financière enregistrée depuis les années 2000, grâce à un marché mondial pétrolier favorable, a incité les pouvoirs publics à adopter et mettre en œuvre des plans de relance économique dont l'objectif est de ré équipier le pays. De plus, à partir de 2005, les pouvoirs publics décident d'élaborer, de débattre et d'arrêter une nouvelle politique industrielle qui permet au pays de renouer avec son projet d'industrialisation. La question qui se pose maintenant est celle de savoir s'il faut reconstruire les grands groupes industriels publics des années 70, quitte à ouvrir leur capital aux investisseurs étrangers, ou bien devra-t-on changer complètement d'option et aller plutôt vers des stratégies d'offshoring, d'attractivité des IDE et de soutien aux PME inspirée du «Small business» le débat reste entier.

2. L'heure est à la relance de l'industrie

Dès l'indépendance, l'industrialisation s'est imposée en Algérie comme choix incontournable seul capable d'enclencher la croissance économique et de garantir des résultats probants en matière de résorption de chômage. De plus, les faibles potentialités agricoles et les entraves qui touchaient l'agriculture prédéterminaient fortement l'option pour l'industrialisation. On peut dire aussi que le modèle « d'industries industrialisantes » qui est retenu et mis en œuvre s'est traduit par la mise en place d'une industrie sidérurgique qui allait permettre la mise en place des autres industries : mécaniques, métalliques, outillages et autres. Ce modèle d'industrialisation devrait être le fait de l'Etat qui se dote pour la réalisation de cet ambitieux projet d'entreprises publiques de grande taille, qui étaient pour chacune d'elles responsable de toute une branche industrielle. Ce modèle financièrement très onéreux, sophistiqué et haut degré capitalistique commence à s'essouffler déjà au début des années 80 pour diverses raisons qui tiennent pou l'essentiel à l'absence de politique de régulation en phase avec le projet industriel et la crise de la dette extérieure qui se déclare avec force(prix fiscalité, crédits bancaires, entraînant l'arrêt du modèle, la restructuration des entreprises industrielles dans le sens de leur démembrement , la réduction des investissements de l'Etat dans le secteur. Cette tendance baissière industrielle s'est amplifiée par l'ampleur que prend la crise de la dette extérieure au début de la décennie 90 et qui a obligé les pouvoirs publics à demander le rééchelonnement qui sera adossé, bien évidemment à un plan de stabilisation macroéconomique et d'ajustement structurel qui réduisent considérablement la dépense publique.

L'industrie algérienne est frappée de plein fouet par la récession, l'investissement est réduit au néant, la production industrielle s'effondre et ne représente plus, dans sa partie manufacturière que 5 % du PIB en 2007.

3. Nouvelle stratégie industrielle ou simple recentrage

La perception d'un autre modèle d'industrialisation qui favoriserait la globalisation et la création de groupes industriels ne semble pas recueillir un consensus auprès des opérateurs économiques qui perçoivent un changement de cap après que les options de partenariat et privatisation eurent montré leurs limites. La constitution des groupes industriels consiste à favoriser l'intégration par la création des effets de synergie et de complémentarité entre les entreprises, au sein d'une même branche ou secteur d'activité. Ce modèle s'inspire quelque peu du schéma organique qui avait donné naissance à la constitution des grandes entreprises industrielles pour répondre aux impératifs assignés à la gestion socialiste des entreprises. C'est le cas notamment pour la sidérurgie à travers la SNS, la Sonacome (construction mécanique et Sonelec (industrie électrique) dont la structuration et le mode de fonctionnement devaient répondre à trois objectifs de rendement économique global :

- Le principe d'intégration qui permettait de créer des complémentarités et des synergies entre l'industrie de base, la seconde transformation et la distribution pour favoriser le développement par filière et la segmentation par produit marché ;
- La décentralisation des grands centres urbains et la régionalisation de l'industrie : la création des emplois de proximité ;
- Un effort de développement axé sur l'évolution de la demande et la diversité d'un marché fortement protégé est suffisamment perceptible.

L'Etat pourvoyeur d'emplois apportait les mesures de soutien et d'accompagnement en accordant les priorités et les avantages de financement aux grands projets : crédit à long terme au taux bonifié de 2,5 %, création de zones d'implantation et développement des infrastructures d'accompagnement.

L'évolution observée dans le mode d'organisation des grandes entreprises a été imposée par de profondes mutations dans l'environnement économique, une nécessité d'adaptation à de nouvelles technologies et un effort de développement de la force de vente pour le maintien et éventuellement la croissance des parts de marché. Les secteurs d'activité ont évolué différemment, certains ont été anéantis par les effets de la crise économique. Ainsi, l'industrie mécanique n'a pas pu préserver ses avantages concurrentiels et ses atouts majeurs malgré la diversification de ses activités, une forte décentralisation régionale et l'existence d'une demande en forte progression d'une période l'autre. Ce secteur a connu une désintégration de ses activités, un net recul au plan technologique en raison d'un arrêt de son développement depuis plusieurs années et des pertes substantielles des parts de marché après surtout l'implantation sur le territoire des entreprises étrangères.

Pour ne prendre que l'exemple de la SNVI de Bouira, son activité est limitée à la production des châssis, carrosserie et boites à vitesses, qui représente en fait un taux d'intégration ne dépassant guère les 30 à 40 %. L'entreprise reste étroitement dépendante dans sa majorité dépendante de sa relation avec les fournisseurs de composants et accessoires qui représentent la part essentielle

véhicule en question. En outre, elle doit supporter une contrainte financière excessive en raison de sa dépendance du marché extérieur pour ses besoins. A court et à moyen terme, l'avenir de cette entreprise dépend de son alliance avec un leader étranger qui peut lui apporter assistance en matière d'apport technologique tout en lui allégeant la contrainte d'approvisionnement en intrants , et de réaliser de meilleurs rendements de production pour faire face à une concurrence de plus en plus rude.

Dans l'industrie automobile comme d'ailleurs dans tous les autres secteurs, l'opportunité de constituer des groupes industriels fortement intégrés dépendra en fait de plusieurs facteurs : l'existence d'avantages concurrentiels qui ferait que l'entreprise peut avoir une position dominante sur son marché, ses liens de dépendance à l'égard des clients et fournisseurs et se capacité à assurer son développement par ses propres ressources. Faut-il également prendre en considération les évaluations faites à différentes périodes dans le secteur de l'industrie et qui ont débouché sur des mesures de restructuration de type de redéploiement ou réhabilitation et dont le bilan montre à l'évidence que les actions engagées n'ont pas toujours données les effets escomptés. A priori, ces actions peuvent s'apparenter comme une forme de stratégie industrielle, sans pour autant caractériser un choix optionnel et dominant.

Les termes que l'on utilise prêtent à confusion : la stratégie peut signifier des changements dans le monde de gouvernance des entreprises pouvant induire des changements importants. En fait, il s'agirait tout simplement d'une actualisation de programme de réformes à mener dans le secteur industriel qui peut aussi signifier adaptation de l'appareil de production qui tiendrait compte des évolutions notables de l'environnement international et des mutations observées sur le marché.

Besoin des investissements directs étrangers

L'IDE constitue la principale composante des flux de capitaux vers les pays en voie de développement, en 1990, il représentait 25 %, et en 2005 il est 60%. L'IDE n'est pas seulement pour le pays hôte un apport de flux financier non générateur de dette, il est aussi un transfert de technologie, un accès à des informations sur le marché internationaux, une intégration au processus de mondialisation. Il faut également souligner que l'IDE correspond aux nouvelles stratégies des multinationales dans leur conquête de nouveaux marchés et dans leur recherche de taux de profit les plus élevés possibles : Les délocalisations, les processus d'outsourcing, d'internationalisation sont d'abord et avant tout des réponses des multinationales à la crise de l'accumulation. Mais l'IDE peut être globalement positif pour les pays en voie de développement Il faut tout de même que le pays hôte ait une réelle capacité d'absorption c'est-à-dire un contexte économique local qui permet de tirer profit de l' IDE Les éléments constitutifs de cet environnement concernent en premier lieu le capital humain, le niveau de formation et de qualification des collectifs de producteurs locaux Une capacité d'apprentissage locale suffisante est une condition nécessaire pour bien assimiler les technologies nouvellement introduites Pour capter les externalités des IDE, il faut que le pays hôte dispose d'un capital humain et d'infrastructures de base importantes Une autre condition et non des moindres pour que l' IDE soit à la fois utile et efficace pour un pays, est celle qui a trait au climat des affaires : la corruption, l'absence de législation claire sur la propriété , le non respect de la

concurrence diminuent considérablement l'effet positif de l' IDE sur l'économie du pays hôte

Le projet sur la stratégie et politiques de relance et de développement industriel insiste beaucoup sur la politique nationale de mobilisation de l'investissement direct étranger Attirer les IDE, c'est avant tout bénéficier de leur externalités Si les IDE peuvent stimuler la croissance et les exportations hors hydrocarbures, ils ne peuvent remplacer la mobilisation du capital national Parmi les mesures concrètes de promotion des Ide, on peut citer la suppression de visa d'entrée aux investisseurs étrangers, ouverture de couloirs et de guichets uniques réservés aux investisseurs, développements de clusters et des pôles de compétitivités, installation d'antennes ANDI, autorisation de l'acquisition de bons de trésor par les étrangers, réduction et exonération des charges fiscales

4. Croissance de l'économie algérienne et performance des entreprises

L'analyse du contexte économique algérien en comparaison à ceux des pays similaires révèle que cette économie à deux atouts majeurs : une main d'œuvre qualifiée et à bon prix et aussi une amélioration sensible des équilibres macroéconomiques lui donnant ainsi une marge de manœuvre en termes de politique économique. Toutefois quelques freins subsistent et doivent être levés pour lancer la mécanique de la croissance : fragilité du tissu économique composé de petites entreprises avec des modes de management anciens, faible attractivité du climat des affaires algérien et surtout la faible diversification de l'économie et sa totale dépendance à l'égard des hydrocarbures qui constituent pour l'essentiel 98 % de ses ressources.

4.1. Atouts à faire valoir de l'économie algérienne

L'Algérie possède des ressources naturelles très importantes capables de lui permettre d'assurer une croissance rapide et soutenue et de soigner son excédent commercial. Elle a également assuré une libéralisation de son économie par la mise en place du processus de privatisation engagé déjà depuis 1995, et la réforme de son système financier loin encore d'être finalisé (Aomar, 2000).

Le secteur des hydrocarbures constitue encore la base de l'économie du pays en assurant 52 % des revenus budgétaires, 25 % du Pib et 98 % des recettes d'exportations[1]. L'Algérie dispose de la 5^{e} importante réserve de gaz naturel au niveau mondial. Elle est en 14^{e} position au niveau des réserves pétrolières. L'économie reste tributaire des fluctuations du marché pétrolier et du cours du dollar, c'est ce qui explique pourquoi l'Algérie s'efforce de diversifier son économie par une politique d'encouragement de l'investissement étranger et local en dehors des hydrocarbures

L'existence d'une main d'œuvre qualifiée représente sans doute un des atouts les plus importants à faire valoir. En effet, l'Algérie dispose d'une main d'ouvre qualifiée techniquement – ingénieurs, informaticiens, techniciens et autres – dont le coût reste très faible : plus de 40 universités et plusieurs dizaines d'instituts fréquentés par prés de 1.500.000 étudiants. Ces données sont en perpète augmentation. La population active ayant un niveau d'études supérieures

[1] Bilan de la conjoncture 2006, données du gouvernement algérien .

dépassait un million de personnes en 2000, soit environ 15 % de la population active.

La mise en perspective de ces données par rapport à ceux de pays comparables à l'Europe centrale et au Maghreb démontre que la performance de l'Algérie se situe dans la bonne moyenne de ce panel de pays. De plus, cette main d'œuvre jouit d'une aisance particulière. La langue française lui procure un avantage pour l'attrait des investisseurs francophones. A cette qualité s'ajoute son faible coût qui demeure compétitif. Le coût horaire en Algérie (moins de 1 dollar par heure) est nettement plus avantagé que celui pratiqué au sein de l'union européenne (entre 15 à 20 dollars) et demeure même inférieur à ceux des pays de l'Europe de l'Est

L'extension de cette analyse comparative à la Chine qui constitue à coup sûr la puissance actuelle révèle un enseignement surprenant. En effet, si l'écart par rapport à la Chine reste en faveur de cette dernière pour les catégorises de personnel les moins qualifiées. Pour la catégorie main d'œuvre qualifiée « top ou middle management » l'écart est à l'avantage de l'Algérie. En chine, la raréfaction des profils d'encadrement, suite aux investissements élevés, a conduit à une tension sur le marché de l'emploi sur cette catégorie et donc à une augmentation des salaires.

Le second atout de l'Algérie est le rétablissement de ses fondamentaux macroéconomiques. En effet, à partir de 1990, on peut noter que l'encours de la dette extérieure a baissé, passant de 32 milliards de dollars Us en 1994 à 17,8 milliards en septembre 2005. Les réserves de changes se sont consolidées pour dépasser la barre de 100 milliards. L'inflation a baissé considérablement pour se situer à moins de 3 %. Le taux de croissance s'est beaucoup raffermi pour atteindre la moyenne de 5 % pour la période 2000-2008. De plus, un important plan de relance de plus de 180 milliards de dollars a été lancé pour la période 2005-2008. Ceci constitue sans aucun doute un signal fort pour les investisseurs nationaux et surtout étrangers pour maintenir la croissance à un rythme soutenu.

4.2. Les facteurs de fragilité de l'économie algérienne

Face à ces atouts, nous avons identifié les facteurs de fragilité suivants qui devront être renforcés.

4.2.1. Economie rentière vulnérable

L'Algérie se met à l'épreuve du développement. L'étendue de son territoire, la diversité de ses richesses et les besoins d'une gestion rationnelle de son potentiel économique se conçoit comme autant d'atouts qu'il faudrait mettre en évidence. Le défi reste donc entier, et plus que jamais les pouvoirs publics sont mis face à leurs responsabilités. L'ouverture débridée de l'économie a atteint en effet un seuil au-delà duquel le pays doit prendre à bras le corps les questions qui engagent son avenir ou il sera désormais condamné à évoluer.

L'économie nationale est rentière à partir du moment où tous les programmes d'investissements économiques et sociaux sont financés par les revenus tirés du pétrole et du gaz. Le problème est que la science économique nous dit que ce n'est pas toujours bien de dépendre uniquement des richesses du sous-sol parce qu'elles ne sont pas éternelles. L'économie est à la fois une science admirable et déplaisante. Admirable parce qu'elle nous explique le fonctionnement du monde dans toute sa complexité, et déplaisante car elle nous

met face à nos comportements qui ne sont pas toujours rationnels, ce qui ne nous rassure guère sur l'avenir.

Selon les chiffres officiels, la progression de la valeur réelle du PIB pour l'année 2006 se situerait aux alentours de 1,8%, il s'agit là, sans le moindre doute possible d'un taux extrêmement faible comparé aux ressources financières engagées. Une croissance due essentiellement aux exportations d'hydrocarbures, dont les prix ont, sans jeu de mots, flambé au cours de l'année en cours et aux secteurs connus tels que les services et les BTP, alors que le service industriel continue de plonger, en fonctionnant à 50 % de ses possibilités.

Le secteur industriel public au plus mal comparé au secteur privé nettement plus performant et dynamique à la fois. Le secteur industriel public est proprement sinistré et semble être maintenu en cet état depuis les années 1980, sous toutes sortes de prétextes aussi fallacieux les unes que les autres. Ainsi le maintien sous perfusion au prix de lourds sacrifices d'entreprises publiques, maintes fois refinancées par les banques publiques, elles mêmes navigant déjà dans le rouge, en raison de ce portefeuille de créances malsaines qui ont fait fuir, à force de manœuvres, même la City Bank qui comptait se porter candidate à la reprise du Crédit Populaire Algérien CPA. Il ne faudrait pas perdre de vue que le coût de ces refinancements s'élève depuis 1989 à nos jours à 60 milliards de dollars. Un paille qu'on aurait aimé trouvé aux temps durs du PAS et des licenciements en masse.

Ce constat de croissance économique très faible comparé aux dépenses engagées amène à deux conclusions :

1- le niveau d'inflation déclaré officiellement à 2,5 % en 2006 est largement en deçà de la vérité. Pour cela il n y aurait qu'à réaliser un panier de la ménagère qui inclurait les produits les plus élémentaires pour les deux années 2005-2006 : légumes semoule lait huile sucre ….

2- Les coûts des marché et des réalisations, les réévaluations successives des projets, souvent scandaleusement gonflés impliquent des transferts indus et de très sérieux soupçons.

Comment expliquer que l'Algérie ait réalisé en 2003 un taux de croissance avoisinant les 7 % (6,8 %) avec un taux plus faible en importations (12 milliards de dollars), alors qu'avec plus du double, on n'arrive plus qu'à 1,8 % de taux de croissance du PIB ?

Un taux faible que même la banque mondiale a pudiquement zappé dans les statistiques de son rapport annuel 2006. Ce qui fait craindre le pire pour 2008, puisque selon les projections du FMI les importations augmenteraient de 32 % par rapport à 2007, pour atteindre 34 milliards de dollars. Même avec ce niveau d'importation, et les effets néfastes de la baisse du dollar par rapport à l'euro, le règlement anticipé de la dette extérieure , le solde de la balance des paiements est resté positif.

Ces résultats ont conduit à une augmentation des réserves de change qui ont atteint un niveau record à la fin 2007 pour dépasser la barre des 100 milliards de dollars. Ces résultats sont dus essentiellement à la mono- exportation d'hydrocarbures. Mais gare au retour de manivelle : si les prix ont dépassé le seuil des 100 dollars le baril, ils risquent de fléchir à tout moment. Reste la dépendance alimentaire du pays car tout ou presque tout est importé et surtout à des prix prohibitifs ces derniers temps, puisque les pays producteurs de produits agricoles

comptent bien répercuter le coût de l'énergie sur les produits qu'ils exportent, et c'est tout à fait légitime.

Ces réserves de change sont en partie déposées aux USA sous forme de bons de trésor américain, rémunérés aux alentours de 4 %, alors qu'une autre partie est confiée à des banques européennes, libellée en euros et livres sterling. Il s'agit de dépôts prudents, faiblement rémunérés à moins qu'ils ne s'agissent de très gros capitaux, mais peu risqués. Ces fonds souverains ne sont rentables que s'ils représentent des sommes importantes, tout en étant gérés de manière compétente et rigoureuse, alors qu'il faut tenir compte d'un environnement boursier assez tristounet.

L'Algérie a souffert du « syndrome hollandaises » et de son exposition à la volatilité du cours de pétrole, sa principale ressource. L'économie n'est pas assez diversifiée. Ce dont on témoigne tout autant les sources de recettes fiscales que le contenu des échanges extérieurs et souffre socialement d'un fort taux de chômage qui pèse fortement sur la paix sociale et en conséquence, sur les capacités des gouvernants à gouverner. Autre facteur qui rend vulnérable les capacités budgétaires de l'Etat, le poids de l'informel, grandement lié aux problèmes de l'emploi, qui pèse sur les ressources fiscales non liées à la manne pétrolière. La transition vers l'économie de marché, où le secteur privé développe son activité dans la sphère formelle est retardée par l'absence de culture financière, laquelle se traduit à la fois par les difficultés d'accès au crédit pour les entreprises privées, mais également dans la répugnance de ces dernières à y recourir, cela supposant une transparence qui n'est pas encore l'habitude et qui fait subir une concurrence plus importante.

4.2.2. Faiblesse du tissu industriel

Le second facteur de fragilité de l'économie nationale est la qualité de son tissu d'entreprises. L'analyse comparative de la structure du PIB et de la taille des cinquante premières sociétés algériennes à celles des pays voisins révèle deux enseignements : le manque de sociétés de services et notamment les services à forte valeur ajoutée, la modestie de la taille des sociétés algériennes en moyenne comparée à celles des pays voisins. Parmi les pays analysés, c'est en Algérie que les 50 premières entreprises hors SONATRACH représentent le plus faible chiffre d'affaires cumulé par rapport aux pays voisins : 7 milliards de dollars contre 17 milliards pour le Maroc, 10 pour l'Egypte et 7 pour la Tunisie. Dans un contexte de concurrence mondiale ou du moins régionale, cette fragmentation est porteuse de fragilité. La taille des entreprises est déterminante pour avoir des coûts de production compétitifs, accéder au financement à moindre coût, mettre en place des plans de développement ambitieux.

L'entreprise algérienne souffre de l'insuffisance de capacités managériales, notamment dans le domaine de marketing ainsi que de l'opacité du système d'information économique. L'environnement actuel de l'entreprise est peu favorable et ne lui permet guère d'être compétitive puisqu'elle évolue dans un environnement fiscal, législatif et économique défavoble. Pis encore, l'absence d'une stratégie nationale de développement économique ne permet pas d'avoir une vision à moyen et à long terme.

La production industrielle du secteur public hors hydocarbures a reculé de 1,3%, de même que celles des industries manufacturières, notamment agroalimentaires - 20,6%, car elle ne peut soutenir la concurrence avec les

importations du secteur privé. La production de ce dernier a d'ailleurs crû de 5 %, ce qui prouve son dynamisme[2]. Ces chiffres soulignent l'urgence d'une restructuration des activités et du mode de gestion des entreprises publiques et les bénéfices potentiels pour l'économie d'un désengagement de l'Etat plus rapide, en termes d'accroissement de la productivité et de la compétitivité.

4.2.3. La panne des réformes économiques

La récurrence des problèmes économiques et sociaux dont souffre le pays en dépit de gros moyens financiers dont il dispose montre à l'évidence que l'inaptitude de l'Algérie à relancer son économie est la conséquence d'une mauvaise gouvernance caractérisée par un manque flagrant de stratégie, de courage et de prévoyance.

Sans vision à long terme et sans stratégie de développements adossés à des principes politiques clairement affinés, les institutions, les administrations et les entreprises auxquelles échoit la mise en œuvre du développement économique et social sont évidemment réduites à fonctionner au jour le jour.

La réforme du secteur public qui a connu pas moins de quatre versions en contradiction les une par rapport aux autres avanceront le moins et dans certains cas perte d'autonomie de gestion des EPE, aucune action déterminante n'a ainsi été dégagée en vue de doter le pays des éléments structurants qui fondent l'économie de marché : marché boursier, marché de change, marché foncier, marché immobilier …

Au regard des résultats plutôt mitigés pour ne pas dire insignifiants réalisés dans ces domaines durant la dernière décennie, on peut affirmer sans se tromper que les réformes économiques devant doter le pays de mécanismes essentiels de l'économie du marché sont en panne.

En dépit de progrès accomplis en matière de réforme structurelle, la réforme dans les secteurs clés reste limitée. L'Algérie possède l'une des économies les moins diversifiées parmi les pays à revenu intermédiaire et les pays producteurs de pétrole.

D'importantes réformes ont été mises en œuvre. Cependant, le programme de réforme à la traîne dans les domaines tels que l'accession à l'OMC, la privatisation des entreprises publiques, la modernisation du secteur financier et dans les domaines de la gouvernance tels que la réforme de l'administration fiscale et de l'appareil judiciaire. Malheureusement, l'actuelle montée en flèche des cours du pétrole masque quelque peu le réel besoin des réformes économiques urgentes. L'Algérie se trouve donc à la croisée des chemins.

Alors que l'ambitieux programme de relance a été lancé, le pays est confronté à un défi fondamental : le créneau d'opportunités sera-t-il exploité à long terme de l'économie et de l'emploi et d'un développement social permanent, ou sera-t-il perdu pour des raisons d'inefficacité, de gaspillage et de corruption ?

De nombreux projets susceptibles de redynamiser la réforme bancaire, la relance de la bourse d'Alger, la réforme de la douane, l'accélération du processus de privatisation sont évoqués sans cesse par les pouvoirs publics, mais en l'absence de précisions et d'un calendrier sur les actions à mener, on ne peut qu'être sceptique.

[2] Rapport de la conjoncture économique et sociale du pays 2003.

Les réformes initiées jusque là, notamment la réforme des institutions financières et bancaires, administratives et douanière doivent être consolidées et accélérées pour être parachevées.

5. Les axes d'action pour la relance de la croissance de l'économie algérienne

Au regard de ce diagnostic, le programme visant à redresser l'économie et à lui donner un élan de prospérité doit se mener sur deux fronts indissociables : construire un tissu économique efficace et l'ancrer dans le sillage de l'économie mondiale afin d'en tirer profit. L'efficacité de l'économie algérienne reste tributaire de la construction des pré requis critiques à tout développement : la construction d'un système de financement efficient, la consolidation d'un tissu d'entreprises compétitives, et ce en termes de produits et de services, d'outils de gestion et de solvabilité financière, et la constitution d'un vivier de managers capables de mener le paquebot à bon port.

5.1. Modernisation du tissu économique

Le tissu économique algérien se caractérise par une très forte fragmentation. En effet, en dehors de bien sûr l'industrie de l'énergie et de quelques fonctions régaliennes on note peu de champions régionaux c'est-à-dire capables de mener un rôle de premier ordre dans le paysage concurrentiel régional. D'autre part, l'Algérie ambitionne de rejoindre les espacés économiques ouverts, comme l'intégration à l'OMC, et de baisser ces barrières douanières vis-à-vis de la communauté européenne.

Les entreprises qui prétendent à un positionnement de leurs produits sur la place internationale doivent faire avec deux exigences de taille

- produire à moindre coût et proposer un produit de qualité supérieur, donc une obligation à une certification Iso ;
- chercher à réduire au mieux les coûts qui continuent à greffer les prix des produits par la mise en place de meilleures actions potentielles sur des compressions des charges.

Contrairement à une vision répondue qui consiste à croire que l'une des premières charges à réduire serait la masse salariale, la vérité est toute autre. L'Algérie est l'un des pays au monde qui offre les plus bas salaires, ce qui justifie en grande partie la fuite des meilleurs éléments vers l'extérieur. Par contre les produits importés (matières premières et équipements industriels) subissent des effets inflationnistes importants dus essentiellement à la faiblesse du dinar par rapport aux monnaies étrangères et plus particulièrement à l'euro. Pour faire face, L'Algérie misera beaucoup plus sur un partenariat solide devant déboucher sur des engagements de processing ou de joint venture. Les exemples ne manquent pas dans ce sens. Il n' y a qu'à voir le cas de Henkel qui a parfaitement réussi son association avec la société algérienne des detergents pour réaliser des produits concurrentiels sur le marché soit local ou externe.

Avant de parler d'adhésion, il est important que les entreprises publiques ou privées se mettent à niveau. Elles doivent devenir compétitives et produire selon les conditions économiques. Elles doivent se baser sur les critères de prix, de qualité et de délais. L'Etat doit jouer le rôle de régulateur et ne peut pas demander aux entreprises de se débrouiller toutes seules. Il doit les accompagner

et mettre en place les outils et les moyens nécessaires pour cette transition vers l'économie de marché. Il faudrait dans ce sens que la politique économique soit claire et lisible. Il est à souligner que l'Algérie a fonctionné depuis longtemps avec un régime socialiste et ne peut passer facilement à l'économie de marché libérale. Il faut que l'Etat soit un prescripteur capable de définir les règles de jeu, compatibles avec les impératifs de l'économie mondiale.

L'Algérie qui compte intégrer l'OMC et qui s'est engagée dans la zone de libre échange euro méditerranéenne ne peut créer les conditions de la réussite de son insertion dans l'économie mondiale et générer des dynamiques socioculturelles du développement que par l'émergence d'une véritable culture entrepreneuriale. Cela signifie que les pouvoirs publics doivent permettre une libéralisation socioéconomique en élaborant des stratégies à partir d'informations sur l'Etat national des lieux, mais aussi sur l'expérience d'autres pays et les avancées les plus récentes de théories et pratiques économiques et sociales.

Pour que l'Algérie retire pleinement des dividendes économiques de son ouverture progressive, il est important que dans la stratégie de développement s'installent dans la durée les dynamiques internes correspondantes fondées sur la formation d'opérateurs locaux capables de créer, de survie et de mener à terme les projets mis en œuvre, selon la trajectoire optimale intégrant les enjeux stratégiques. Les défis sont de pouvoir avec pertinence et efficacité, arbitrer, décider et prendre les initiatives cohérentes dans un environnement relativement nouveau et en pleine mutation où les enjeux sont soumis à des logiques locales.

Pour faire face à ces défis, les entreprises doivent rattraper et améliorer leur culture managériale autour des axes suivants : renforcement et professionnalisation des fonctions commerciales/marketing, utilisation des leviers technologiques et généralisation des cycles de formation.

5.2. Développement des champions régionaux dans les secteurs porteurs

Le développement du tissu économique doit encourager l'esprit entrepreneurial certes, mais ne doit pas conduire à un tissu industriel diffus. Quelques segments stratégiques doivent être sélectionnés pour favoriser l'apparition de champions régionaux capables de jouer un rôle de leadership au niveau de l'Afrique.

Parmi les secteurs dans lesquels ces champions pourraient apparaître, on peut citer le secteur bancaire, clé de coûte du système économique, le secteur de la haute technologique grâce à la main d'œuvre qualifiée et à bas prix dont dispose le pays. Cette industrie sera un des secteurs attractifs des IDE pour la sous-traitance off-shore. L'Inde est une illustration dans le genre de l'apport d'un tel secteur pour le développement. D'autres secteurs pourraient bien sûr être envisagés pour tirer avantage. Le développement de ces champions ne doit pas se faire nécessairement par la création de sociétés étatiques, mais plutôt en favorisant le développement de quelques sociétés qui existent et qui ont déjà des bases saines et en les aidant à nouer des partenariats avec des opérateurs étrangers.

5.3. Mise en place d'un système de financement efficient

Un autre élément levier à mettre en œuvre concerne la construction d'un système bancaire efficient à travers la modernisation des systèmes d'informations et l'émergence de banques solides grâce à des coopérations capitalistiques et/ ou

techniques avec des leaders mondiaux pour assurer la montée en compétences locales. Cette stratégie de consolidation du secteur bancaire doit faire apparaitre plusieurs grandes banques afin de ne pas rendre dépendante la santé de tout le secteur d'une ou de deux banques. Maitriser la politique des crédits par les banques en se dotant d'un système de scoring. La non maitrise de la politique des crédits est un des risques majeurs qui guettent les économies non aguerries. Il n'ya qu'à voir les enseignements tirés de la crise mondiale financière qui secoue la planète. Un autre volet concerne la construction d'un système de financements de projets et d'accès au capital proche des lieux de la recherche pour lancer le moteur de l'innovation. Le financement bancaire pour le moment reste le premier levier, mais des instruments de financement du type fonds de capital risque doivent être développés et nécessairement complétés par des dispositifs de coaching tels que les incubateurs pour s'assurer de l'aboutissement des projets.

5.4. Développement humain

Les économies développées qui mènent le processus de mondialisation sont aujourd'hui sur un nouveau paradigme de croissance : l'économie fondée sur la connaissance. La compétitivité, la performance économique reposent de plus en sur la connaissance, le savoir, le savoir-faire et non pas seulement sur le capital et le travail. L'immatériel est aujourd'hui un facteur de production stratégique.

Il semblerait que l'Algérie ait tiré les leçons des précédents chocs pétroliers et veuille utiliser les ressources générées par le boom pétrolier pour diversifier l'économie à travers notamment la nouvelle politique industrielle La réussite d'une telle politique dépendra largement des incitations données à l'émergence d'une classe d'entrepreneurs dynamiques porteurs d'innovation et générateurs de valeurs ajoutées.

La faible part de l'industrie manufacturière dans les exportations montre clairement que ce secteur reste tourné vers son marché local. Cette situation n'encourage pas les progrès de compétitivité à travers une politique active d'innovation, ce qui ampute encore les perspectives de croissance à long terme.

L'Algérie doit faire sien ce nouveau paradigme. Système éducatif et de formation, technologies de l'information et de la communication, innovation et recherche, climat des affaires : c'est là que se jouent nos chances d'intégrer par le haut la mondialisation de l'économie et de tirer profit de la densification des échanges économiques internationaux. Le pays peut se vanter d'un réseau important d'universités et d'instituts, qui lui permettent d'afficher un nombre important de diplômés universitaires. Seulement la qualité de l'enseignement dispensé reste loin des aspirations voulues surtout pour ce qui est du domaine de management. La qualité des managers algériens reste donc à parfaire. Pour remédier à cela quelques principes fondamentaux sont à intégrer dans la construction du cursus universitaire : revaloriser l'enseignement de la gestion et lui donner la place qui lui sied, remettre l'accent sur la pratique via les stages, développer l'enseignement des langues pour tirer profit des expériences outre-mer.

5.5. Conclusion

L'économie algérienne est stabilisée et a réalisé ses équilibres macro-économiques. Seulement, elle souffre d'importantes fragilités au niveau de son tissu d'entreprises : faible diversification, faible performance des entreprises, tissu économique fragmenté.

Depuis le premier plan d'ajustement structurel sous la couverture du FMI en 1974, l'objectif de stabilisation macroéconomique a été atteint. Il est temps d'aller vers des politiques de l'entreprise plus rigoureuses. D'autant plus qu'à la vue des réserves pétrolières prouvées, du rythme de production actuel et des prix projetés sur le marché, l'Algérie disposerait de plusieurs milliards de dollars de surplus pétrolier sue les 15 à 20 prochaines années qu'il faudrait utiliser rationnellement pour construire l'avenir du pays.

Pour sortir de cette ornière, le pays a besoin d'un projet économique d'envergure dont nous avons rappelé les différentes actions à mener. A chaque action sa « task force ». Avouons que face à l'ampleur de la tache et surtout le poids des enjeux pour l'avenir de l'économie nationale, il est difficile de comprendre l'immobilisme actuel. La stratégie de développement industriel qui doit faire l'objet d'un débat certainement houleux et sans doute très élargi aura à intégrer d'autres contraintes pesantes, dans la mesure où le constat actuel montre une nette détérioration du tissu industriel et plus particulièrement celui relevant du secteur public. Enfin, la stratégie industrielle telle qu'elle est voulue ne s'arrête pas à l'énoncé d'un choix de branches prioritaires cible, mais doit lancer des politiques précises qui mettent en place les conditions d'un changement structurel de l'industrie algérienne pour que son contenu passe de l'activité relevant de process simples ou d'exploitation de ressources primaires vers des activités plus complexes et plus flexibles requérant des technologies avancées.

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