Dynamic Externalities and Regional Development: The case of Tunisia

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Abstract - In this paper we seek to estimate the impact of local economic structure on the regional employment growth of 8 mainstream industry sectors in 24 local areas of Tunisia between 2000 and 2009. By referring to new economic geography and the empirical approaches dealing with agglomeration economies and dynamic externalities, we show that regional employment growth in industrial sector in Tunisia is driven mainly by externalities related to specialization while diversity do not seem to be important determinants of regional employment growth. Moreover we find that local competition have a positive significant effect on local employment growth.

Keywords: regional growth, dynamic externalities, industrial structure, regional integration,

JEL Classification: R11, R12, O47.

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Introduction

Over the last decade, Tunisia has achieved a 5% average annual growth thanks to improved total factor productivity (TFP), despite a relatively low diversification of the economic basis, the relatively rapid pace of growth in external demand, and the crucial role played by domestic demand, especially consumption. However, investment in Tunisia remains at a relatively low level of nearly 22% of GDP in 2013 against nearly 25% in 2003 and its contribution to economic growth is limited. Moreover, despite the economic reforms implemented in the 80s accompanied by the business climate cleansing policies, the level of private investment remains insufficient does not exceed 14% of GDP and the share of private investment in total investment did not go beyond 60% over the past two decades. In addition to the relatively low level of investment in Tunisia, the regional distribution shows a wide disparity between the coastal and the inland areas. The coastal regions (Northeast and Central East) which create the most jobs provide most of the public and private investment while the northwestern, the midwestern and the southwestern regions with higher unemployment rates, have the lowest private and public investment shares. The high level of public investment in the areas of the Northeast and the Central East seems to explain, albeit partially, the attraction of private investments in these regions and thus the ability of the latter to create more jobs than the rest of the country. An inherent and obvious relationship seems to enclave some areas in underdevelopment and inequality.

Yet, since the country's independence in 1956, the issue of reducing inequalities, including the coast-inland regional inequalities, was considered as one of the key objectives of economic growth and national development. Henceforth, the economic strategies implemented by the Tunisian authorities were supposed to establish and boost the economy of the whole country, and drive effective integrated development by fostering public investment in the productive activities in parts of the inland areas. The sugar-processing plant in Beja in the northwest and the paper-unit in Kasserine in the central west dating from the 60's decade reflect the will of the government to shrink the disparities between the coast and the inland regions. However, these initiatives have not yielded the expected outcome and the regional imbalance has even worsened. Thus the government was compelled to rethink its development programs so as to hammer out a genuine regional policy to create an economic environment likely to bring about national development. Series of schemes have been launched since the 60s to boost

development in areas but without concrete results[2]. Thus, the inventory of regional development in Tunisia highlights acute structural imbalances inherited by the previous development policies, and the long-term regional inequalities that account for the current economic and social situation of the country. The regional disparities due to the social instability factors have caused ever-increasing migration to the large urban areas and it seems that the dynamic externalities have not yielded the desired effect on the development of the inland regions that have remained isolated in their traditional economic role. In contrast, they have been deepened by rising unemployment that particularly affects the youth, the graduates as well as the women. Thus, the14 January 2011 Revolution, expressing the need for freedom and democracy bore the expectations of the majority of the Tunisian people in terms of mitigating regional and social inequalities and improving their living standard.

This research seeks to examine the importance of dynamic externalities in order to account for the economic growth achieved in the different regions in Tunisia over the 2001- 2009 period while retaining a level of spatial and sectoral disaggregation (24 governorates and 8 industrial sectors). Indeed we propose to study the relationship occurring between, the dynamic externalities and the local economic growth in the different regions in Tunisia with reference to the pioneering work of Glaeser et al. (1992) and Henderson et al. (1995). The growth of the economic sectors within a locality is partly accounted for by the externalities' indicators stemming from specialization (MAR- Marshall, Arrow, Romer type externality), diversity (Jacobs type externality) and those generated by the local competition (Porter - type externality). The objective is to find out which type of externalities has benefited the various regions in Tunisia. Because of the absence of a growth indicator of regional GDP in Tunisia, we have retained, as many empirical studies, the growth rate of the regional employment as a proxy for the regional growth.

The paper is outlined in four main parts. In the first part, we review the main theoretical and empirical works underlining the relationship between the dynamic externalities and local economic growth. In the second part, we briefly present the state of the regional disparities in Tunisia. While, in the third part of the article we shall specify the model to be estimated and present the selected variables and indicators. Eventually, the fourth part is dedicated to the presentation of the main findings.

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[2] Among these programs we mention the Rural Development Program and the Integrated Rural Development Program. More recently, at the local level, the Municipal Investment Program (CIP) involves the preferred tool for development of the municipal infrastructure.

1. Dynamic Externalities and local economic growth: theoretical and empirical facts

Local or regional economic development emerged, as a concept in the 60s following the Great Practical Plan aiming at upgrading the regions left behind. This process is explained through various indexes and variables characterizing the local economic structure used also to investigate the evolution of spatial distribution patterns of the economic activities. The increasing inequalities in the living conditions and access to resources show the importance of mobility factor in the agglomeration process. As a matter of fact, developed areas attract the business organizations seeking new investment opportunities; indeed, the companies are ready to pool their activities, forming a "spatial cluster". We have already revealed a relationship between the location of firms and the average size of plants. This spatial concentration is bolstered by scale returns allowing companies to reduce their production costs. Besides, the firms established in these areas take advantage of clustering with other firms in the same sector which raising a positive effect of localization economies. Furthermore, this leads to an inter-sectoral positive effect of urbanization economies which promotes economic growth.

This urban dynamic is ensured by the optimal use of local resources in a more efficient productive system. New approaches based on economic geography and an international trade theory put forward by Krugman (1991), have been well developed, to further account for the interdependence between the size of plants and concentration of firms. These models provide an analytical framework for the description of a regional or local economy in a situation of integration and help to clarify the causes of local development. They particularly emphasize the importance of the intensity of agglomeration forces, also influenced by both the size of the local economy and the scale of competition. They explained the location choices of firms and agglomeration process by the coexistence of increasing- returns and transportation costs in an imperfect competition (monopolistic competition). The spatial polarization of the economic activities is due to the positive externalities' effect based upon the market interactions.

A. Marshall, 1920 distinguish between two types of scale. If the scale returns are internal to the firms, the increasing returns generate productivity gains and are therefore linked to the firms' development. The second type refers to the external economies that benefit all firms from clustering in the same sector. These external economies, generating inter-sectoral positive effects are perceived as a geographical phenomenon connected to urbanization and promotes the economic growth. These localization and urbanization economies are related to specialization and diversity, and having a significant effect on the local economic development, they are related to the intensity of agglomeration forces.

Drawing on the work of Arrow (1962) who lays down through "The involvement of learning by doing", the notion of productivity- gains associated with the accumulation of physical capital and learning through experience, and Romer's work (1986) conducted on endogenous growth which emphasizes the importance of increasing returns generated by the externalities associated with the accumulation of capital and its impact on long-term growth. These externalities show several features and reflect the benefits associated with increasing returns not only of the accumulation of human capital, the physical capital gain in productivity, innovation, research and development (R & D) but also of the spatial dynamics' externalities either at the local (inter and intra-industry) or international level via foreign trade, FDI flows or the globalization of R & D activities[3].

Inspired by the pioneering theoretical work of (Marshall (1890), Arrow (1962) and Romer (1986)), Gleaser E. et al. (1992) seek to analyze the causal relationships between the local economic structure and local employment growth, called M.A.R type with reference to Marshall, Arrow and Romer. The latter refer to localization economies derived from the exchange of knowledge and learning from specialization. These agglomeration economies are intra-sectoral; by definition they are "external economies to the firm but internal to the industry located in a given metropolitan area" (M. CATIN 1994). By contrast, Jacobs (1969) underlines the evidence of the diversity effect in the process of local economic development; thus reflecting the urbanization economies. These inter-sectoral economies (of Jacobs' type) are defined as "external to the firm and outside the industry to which the firm belongs" (M. CATIN 1994), and they are also related to the average plants' size. They imply the presence of a high number of firms in the same environment and an inter-sectoral positive agglomeration effect resulting from the concentration of populations which are likely to boost the suppliers' business in the area.

Beside the specialization and diversification effects, Porter (1990) show that local growth also depends on the local competition. Glaeser et al. (1992), ascertain that the presence of a large number of companies allows productivity gains. These intra-sectoral agglomeration economies called "Porter type externalities" depend on the size of the local market and the number of firms operating in the industrial sector.

Although several academic studies have investigated the determinants of local economic growth, the issue of dynamic externalities has drawn little attention despite its significant implications on the regional growth. Some authors tried to explain the spatial location of activities through the impact of the localization and urbanization economies on local economic

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[3] *Lucas 1988 ; Aghion et Howitt 1998.*

development. Mainly drawing on the work of Glaeser et al. (1992), they raised the issue of the nature of local externalities through a MAR type specialization, a Jacobs type industrial diversity index, and an index of local competition which provides data on the market structure. Glaeser et al. (1992), while measuring the employment growth in US cities, showed that the sectoral diversity and local competition are growth drivers, while specialization inhibits growth. This corroborates the hypothesis laid down by Jacobs and Porter and rejects that of MAR. The same assumption was extended, and was taken over by Henderson et al. (1995), who in turn found that specialization allows growth in the low added-value activities and traditional industries, while industrial diversity, promotes employment growth in the high-tech industries.

Glaeser et al. (1992) and Henderson et al. (1995) also allowed the application of their methods in other countries. By reproducing the same methodology to assess the employment growth in the industrial sectors of the French regions, Combes (2000) found moderate unfavorable results. Indeed, the local competition negatively affects the growth of the industrial sectors as it has a positive impact on some service sectors. Specialization such as diversity is significant, but has a negative effect on the growth of employment for most of the industrial sectors subject to an extensive restructuring as they have a positive impact on the service sectors.

By measuring the local employment growth in the Spanish industrial sectors, De Lucio and al. (1996) found results matching those of Glaeser et al. (1992). Nevertheless, De Lucio and al. (2002) tried a more adapted approach using labor productivity and value-added growth instead of employment growth as a measurement. Their findings therefore reveal that high specialization promotes productivity growth.

Henceforth, the MAR externalities have a positive effect, while those of Jacobs and Porter did not occur. This same method is reproduced by Henderson (2003). The latter uses the total factor productivity (TFP) as growth measurement in the US metropolitan cities. The results show that the geographic concentration of firms belonging to the high-tech sector is more likely to boost productivity, and the average size of the plants is involved only with a minor role. This same method is reproduced by Catin (1991), who seeks to explain the TFP growth in the French regional industries. He was able to show that the decomposition of regional productivity in terms of productivity gains induced by the scale economies and autonomous productivity gains are particularly significant and have very different disparities. The agglomeration economies that provide the urban areas drive large plants to cluster within narrow geographical areas such as labor systems. However, the low –labor- cost, the low-added value industries, and the search for scale economies drive small firms to relocate within wider areas. Batisse (2002a, b) tests the kind of local economic structure that fosters the growth of value added activities in Chinese

provinces. However when a variable discriminating the regions is introduced into the regression, results are thereby well-balanced showing that diversity implies an inter-sectoral positive effect on the growth of sectors that are located in the more developed coastal provinces rather than in the inland provinces, unlike the high initial specialization which has no effect.

The survey carried out by Maurice Catin et al. (2007) on Morocco, reveals that the dynamic externalities are characterized by sectoral specificities. Some sectors in a given period are more sensitive to the specialization and the local competition effects than others. The empirical studies failed to establish a general explanatory framework. The heterogeneous results are mainly due to the different specificity of the cases studied and the different assessment techniques used as well as the difficulty in using data series at the micro-spatial level. We may retain Bun and Makhloufi's study (2002) applied on the Moroccan case in a very limited spatial area. As a matter of fact, the interactions between the activities are exercised at the level of the province leading to external economies effects, thus indicating the importance of space dimension. A too small territory implies the consideration of the spillover effects, mainly the externalities' effects on the neighboring regions.

Despite the fact that the research dealing with the relationship between the industrial structure and the sectoral growth in the developing countries are relatively scarce, the empirical literature allowed us to note that the countries rated at a certain level of development are more sensitive to externalities (Jacobs and Porter).However, the economies of the less developed countries are more sensitive to the MAR externalities .Besides, the local concentration of industries is often linked to a specialization in the low added- value industries. Therefore, an economic growth in the region might lead to a diversification of the industrial sector. Indeed, an urban maturity and even a specific stage of development, as well as some phenomena occur in the urban mainstream industrial poles, leading to the relocation of the low-value-added industries towards the less populated regions. Nonetheless, the high-tech industries which are less sensitive to the production costs and which benefit from the physical capital accumulation thrive in the less developed areas.

2. Spatial disparity and regional inequalities in Tunisia.

A simple analysis of the economic geography of Tunisia highlights a contrast between the coastal Tunisia thriving with industry, services and tourism and the deeply rural inland of Tunisia (Dlala, 1999; Belhedi, 1996). The coastal regions account for 90% of the overall employment and more than 80% of jobs in urban regions. Moreover, the most dynamic centers are located in the northern and central coastal regions. In fact, the coastal regions which represent only 27% of the total area in Tunisia gather more than the fifth of the population. The

latter increases with a rate that is higher than the national average as more than 63% of the additional population dwell on the shoreline regions. This coastal space clusters almost half of the farming population of the country. It accounts for 80.4% of the fruit-production, 72.6% of the vegetables' production, 30%of cereals, 80% of the citrus and grapes' output, and more than 55% of the livestock value and the third of the olive production.

Likewise, the coastal areas account for 85% of the business companies operating in all the sectors. Indeed 99% of the companies operate in the, mechanical, electrical, and chemical sectors, along with 83% of the building materials' plants and more than 80% of the companies specialized in textile and clothing are established in the coastal regions.

Also, it should be noted that the imbalances between the regions are obvious in terms of public investment. Indeed, the regional distribution shows a strong disparity between the coast and the inland areas of the country (Table 1) as the coastal regions (Northeast and Central East) which create the most jobs, hold the biggest public and private investment share while the Northwest and the Central West regions where the unemployment rates are the highest, have the lowest private and public investment shares.

Table 1: Private and public Investment Structure in the regions

Region	Investment Structure Public vs private in each region		Private and Public Investment Structure between regions	
	% Private	% Public	% Private	% Public
Northt-east	69	31	49	41
Central east	70	30	23	18
South	62	38	16	18
North-West	47	53	7	14
Central-West	52	48	5	9
Total	**65**	**35**	**100**	**100**

Source : Mid-term 11th Plan report

Thus, the relative lagging of the regions of the inland areas compared to the coastal ones is accounted for by the spatial inequalities in terms of infrastructure, healthcare and education despite being provided free of charge in all the regions. For example, the number of hospital beds and the number of physicians per 1,000 inhabitants is significantly lower in the west and the south of the country compared to the major urban centers of the East. The high level of public investment in the areas of the Northeast and the Central East seems to explain, albeit partially, the attraction of private investments in these regions and thus the ability of the latter to create more jobs than the rest of the country. These disparities made the underprivileged areas less attractive for private investment and thereby created a negative cumulative process.

Henceforth, the great West does not benefit from sufficient public investment, which severely hampers private investment in the absence of a public economic drive. The effect is immediate on employment, as the unemployment rates are well above the average (Appendix 1, Table 1 and 2) and a mass exodus occurs mainly on the coast.

So, in Tunisia the economic development generated increasing spatial inequalities between the developed and rich coast and the impoverished inland and entire regions in Tunisia were even excluded from the national development process which is built mainly on the coast. All the spillovers and all the expected and promised positive forms of external economies have only widened this gap between the regions. Indeed, whole territories of the inland remain locked in their traditional economic vocation.

3. Estimation of the effects of dynamic externalities on regional growth in Tunisia.

Our research focuses on the regional growth of the industrial sector in Tunisia between 2001 and 2009 and seeks to estimate the impact of dynamic externalities on regional employment growth in Tunisia The objective is to find out which type of externalities (MAR-JACOB-PORTER) have benefited the different regions in Tunisia and to what extent the regional agglomeration economies and the initial industrial structure helped explain the regional growth in Tunisia.

In the absence of a of regional GDP measurement in Tunisia, and referring to Combes (2000), we use the growth of employment as a proxy for regional growth. The data are picked out from the INS statistics of the (The National Statistics Institute) and APII (The Industry Promotion and Innovation Agency) and cover eight major sectors of the industry in the 24 governorates of Tunisia (Appendix 2). The sample includes a total of 192 observations.

3.1. The model

The model that we seek to estimate should reflect the sectoral heterogeneity variables in the context of a relationship between the local industrial structure and the employment growth. To do so, we propose to specify a heterogeneous model parameters, which exploits the whole dimension of our data. Thus, the model used to test the effect of the characteristics of the local economy on the regional employment growth of a sector s of region r is given by:

$$\text{Ln } Y_{s,r} = \alpha + \beta_1 \ln(Spe_{s,r}) + \beta_2 \ln(Div_{s,r}) + \beta_3 \ln(conc_{s,r})$$
$$+ \beta_4 \ln(den_r) + \beta_5 \ln(condin_{sr}) + \mu_{s,r}$$

where s = 1 ... ..8 represents the sector index and r = 1.....24 spatial index (24 governorates).

The explained variable is the growth of employment over the period 2001-2009 and the explanatory variables express the different types of externalities of MAR- Jacob Porter type, and, respectively related to specialization (Spe), diversity (Div) and competition (Conc) at the beginning of the period (year 2001). In addition to the externalities' indicators, we introduce the control variables expressing certain regional characteristics such as the density variable (den) which expresses the concentration of employment in a given region and the regional sectoral specificities such as the initial conditions of a sector in a given region that draws the industry's ability to grow given its initial position and which are expressed by the variable (Condin).

3.2. The variables and indicators used

For setting all the dependent and explanatory variables for each sector and in each area, and in order to avoid heterogeneity and selectivity problems, we apply the Combes Standardization Approach (2000) by dividing, for each sector, the values they take at the aggregate level. This process is likely to make the variables comparable from one sector to another.

The index of the sector's employment growth:

The explained variable is expressed by the index of the sector's employment growth in region r (governorate) reported to the index of employment growth in the same sector at the national level. Employment in the sector s, in region r in year t is stated as $emp\,s,r,t$. The dependent variable is thus standardized by its value taken at the aggregate level of Tunisia that is:

$$Y_{s,r} = \frac{emp\,s,r,2009 / emp\,s,r,2001}{emp\,s,2009 / emp\,s,2001} \qquad ; s = 1....8 \text{ and } r = 1....24$$

The specialization index (SPE):

This is the type of indicator which enables to keep the MAR -type externalities. It is measured for each sector s by a specialization index of the region (governorate) r in this sector. It is approximated by the classic ratio of the share of the sector in local employment in the region r standardized by the share of that sector in the national employment

$$SPE_{s,r} = \frac{emp\,s,r \,/\, emp\,r}{emp\,s,n \,/\, emp\,n} \qquad ; s = 1....8 \text{ and } r = 1....24$$

The sectoral diversity indicator (DIV):

This is the indicator that provides information on the JACOB type of externalities expressing the impact of the sectoral diversity that the company of an industrial sector faces in a given region[10]

Generally, the diversity index is measured by the inverse of the index of industry concentration. The more the industry is concentrated, the less it is diversified. Thus, the sectoral diversity faced on average by a firm is measured by the inverse of the Herfindahl index (Hr) related to the sectoral employment concentration calculated on all the sectors except the sector involved, which is standardized by the same indicator gauged at the national level. The Herfindhal index for each sector s in each region (governorate) r is yielded by:

$$H_{s,r} = \sum_{s'=1, s' \neq s}^{s} (\frac{emp\ s',r}{emp\ r - emp\ s,r})^2 \qquad ;\ s\ =\ 1....8\ and\ r\ =\ 1....24$$

whereas the index Herfindhal for a sector s at the national level is given by.

$$H_{s,n} = \sum_{s'=1, s' \neq s}^{s} (\frac{emp\ s',n}{emp\ n - emp\ s,n})^2 \qquad ;\ s = 1....8$$

After reversing this index at the regional and national level, we obtain the standardized diversity indicator:

$$DIV_{s,r} = \frac{1/H_{s,r}}{1/H_{s,n}} \qquad ;\ s = 1....8\ and\ r = 1....24$$

The local competition indicator (CONCU):

To measure the sectoral concentration, we often recommended to use the Herfindahl index which implies calculating the market share of each company in the sector considered with reference to its turnover or employment provision as proxies of the size. However, we do not have data on individual companies operating in the different sectors and regions involved making it impossible to retain this indicator. We opted for an approximate index provided by the ratio of the number of firms in a given sector related to employment in the sector. Therefore, for a given region, an average high ratio compared to the national average ration expresses a relatively high level of competition in the sector of the region studied.

$$CONCU_{s,r} = \frac{nbre\ de\ firmes\ s,r\ /\ Emp\ s,r}{nbre\ de\ firmes\ s,n\ /\ Emp\ s,n} \qquad ;\ s = 1....8\ and\ r = 1....24$$

Other variables that reflect the local features of the industrial sector have been introduced in the assessment study as control variables. These include indicators that reflect the initial conditions characterizing the region (the governorate) and the urbanization economy indicators.

Initial conditions Index (Condin):

With reference to the research conducted by Glaeser et al. (1992) and Henderson et al. (1995), we use the initial level of the dependent variable, i.e., employment at the beginning of the period. This indicator can provide information on the existence or no-existence of a regional convergence process in this area in the period of analysis; This indicator is calculated as the ratio of the initial level of employment in the sector s in region r compared to the population of the region surveyed:

$$CONDI_r = \frac{emp_{s,r,2001}}{pop_{r,2001}} ; s = 1....8 \text{ and } r = 1....24$$

Urbanization economies' Indicator (Den):

Under the new economic geography theory, growth would tend to be higher where production is already concentrated; i.e., where demand stemming from the consumer-workforce is already initially concentrated. To keep these effects, we use an employment density index as the local economy size indicator

$$DEN_r = emp_r/area_r \ ; r = 1....24$$

Where $area_r$ is the area of the district in square kilometers.

4. The results.

The estimation results (Table 2) show a significant effect of all the variables except the diversity indicator. This corroborates the importance of the MAR and Porter type externalities for the regional growth in Tunisia while the Jacob type externalities related to industrial diversification are not significant.

Table 2: Estimation Results - Industrial Structure and Regional Growth

	Coef	*Std Err*	*T*
SPE	*0.355 (*)*	*0.150*	*2.37*
DIV	*0,431*	*2,853*	*1.23*
CONCU	*4.647 (**)*	*0.230*	*20.20*
CONDI	*-0.112 (**)*	*0.040*	*-2.81*
DEN	*-5.058 (**)*	*0.139*	*-36.38*
Cons	*9.025 (**)*	*0.543*	*16.62*

Nbr obs = 192 - Number of groups = 24 - Obs per group = 8 - R-sq = 0,60
(**) 1% significant coefficient-   (*) 5% significant coefficient

Unlike the results yielded by Karray Z. and Driss S. (2009), the specialization of the industrial sector is a key factor for the regional growth in Tunisia and the intra-industrial externalities, mainly on the coastal regions have boosted the growth of employment as in the case of Morocco (Catin et al. (2007))

These externalities are accounted for by primarily a common-data base in some industries, concentration and the availability of skilled labor in the region, etc .Also, it is worth noting that these intra-industrial externalities are strengthened by the competitive effects between the small firms established in low added value sectors where competitiveness is driven mainly by low prices through - wage –cost cutting.

However, unlike the results yieded by Karray Z. and Driss S. (2009) for the Tunisian case and those of Catin et al. (2007), for the case of Morocco, the Jacobs type externalities associated with the diversification of the economic activities in industrial sector in the regions are not significant. This difference in our findings particularly with respect to those of Karray Z. and Driss S. (2009), both regarding the effect of specialization as well as the effect of the diversification may be explained on the one hand, by the lapse of time of the retained period for the estimation of the externalities' effects on the regional growth in Tunisia and the difference of the indicators used to measure diversification, on the other. Indeed, Karray Z. and Driss S. (2009), consider a 5 year- period for gauging the external effects on the regional growth between 2000 and 2005 and retain the year 2000 as reference year which we think is a too short period to assess the importance of externalities that usually occur in the medium- long term, while we retain a relatively longer period.

Furthermore, for setting the externalities indicators, the authors use the (2000) Combes' approach by standardizing the indicators for each sector by the values they take at the national level and to avoid the problems of selectivity and heterogeneity. However, the authors have not applied this method for the Jacobs-type externalities associated with diversification which explains a priori the difference with our results since we completed the standardization of all the indicators including the endogenous variable which expresses employment growth.

Thus, it seems that the MAR type externalities are the most significant variables for the growth of employment in Tunisia. This growth is mainly driven by foreign direct investment in the manufacturing sector that is geared primarily towards exports, and   which is heavily concentrated on the coast in the sub-contracting activities or low-value and low-cost machine-assembly units (textile, electrical, mechanical, etc ..).

Indeed, the dynamic of industrial -job creation in Tunisia over the last twenty years is the result of the productive restructuring policies since the free trade agreement with Europe in 1995. The upgrading strategy on the one hand and the pricing policy on the other aimed at improving the competitiveness of the traditional sectors and fostered the emergence of new sectors so as to meet the European demand and have transformed the industrial structure.

The data show (Table 2) that it is rather the exporting companies that perform best in job creation. In fact, the totally -exporting companies account for nearly 50% of the manufacturing companies, which are mainly characterized by a significant participation of the foreign capital and which overwhelmingly contribute up to 65% in the creation of industrial jobs most of which are created in the textile and clothing sector (ITHC 35.6%) and the sector of electrical and electronic industry (EEI 13.3%).

Besides, these off-shore enterprises are weakly integrated into the local economy as they are positioned in lower -cost assembly operations and outsourcing . The inter-sectoral externalities' effects associated with the Jacobs type externalities are almost naught since these companies are not supplied by the local businesses. The raw materials and the semi-end products are imported under the temporary import regulations to be re-exported after assembly in the subcontracting factories and offshore companies operating in Tunisia.

Tableau 3 Off-shoring and job creation in Tunisia

SECTORE	Off- shore entreprises		Off-shore employment		Average employment		
	in total industry	in the sector	in total industry	in the sector	Off shore	On shore	Total
IAA	3,1%	17,3%	3,3%	24,2%	28(	71	206
ITH	29,3%	84,1%	35,6%	91,0%	10(	55	98
ICC	3,8%	75,0%	5,6%	92,0%	66	53	55
ICH	2,1%	23,6%	3,5%	45,4%	14(	55	77
IMCCV	0,5%	6,2%	0,2%	3,6%	71	56	61
IM M	3,1%	30,2%	2,6%	35,2%	92	60	66
IEE	4,1%	64,5%	13,3%	87,7%	129	33	105
ID	1,6%	18,4%	1,1%	20,1%	40	50	46
TOTAL	**47,6%**		**65,2%**		**119**	**58**	**87**

Source :Author's processing(INS-API-FIPA data)

Likewise , although the policy of openness has helped improve productivity, it did not result in greater export diversification . Figure 1 shows that the index of diversification in Tunisia remains relatively high and reflects a product-exporting structure which is still divergent compared to that of the developed countries. Furthermore, the exports structure in Tunisia is characterized by a relatively high concentration level (Figure 2).

As a matter of fact, although the concentration index[4] recorded a steady decline since l995, it remains at a higher level than that of Turkey and the developed countries. This is mainly due to the specialization of foreign direct investment and the industrial sectors in outsourcing low-cost business diverted to the European market.
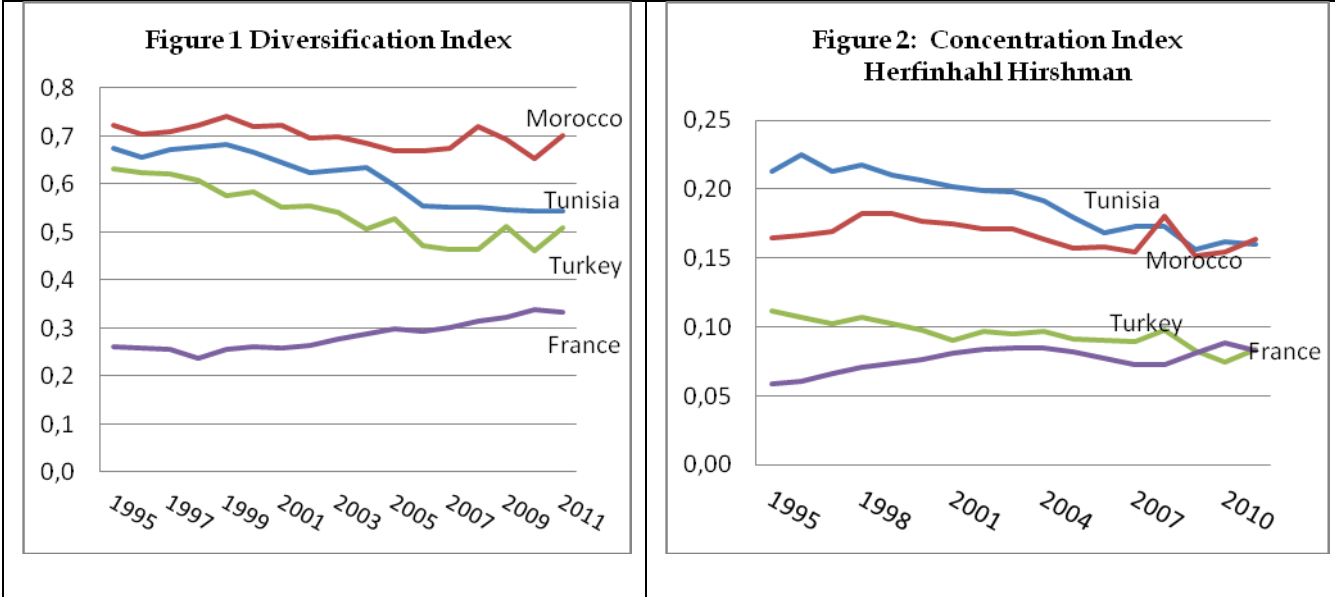
Author's processing - UNCTAD DATABASE2012

Finally, we note that the effects of the selected control variables, both the density of employment in the region and the initial conditions are significant and negative. In Tunisia, the high density of industrial employment often results in urban infrastructure congestion and the saturation of the industrial areas generate congestion effects limiting employment growth.

Moreover, for the effect of the initial conditions, approximated by the level of employment at the beginning of the period, it seems that the governorates which initially had a low level of employment have witnessed in the considered period the highest growth rates. The hypothesis

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[4] The concentration index, also called Herfindal-Hirshman Index Measures the market-concentration degree.

$$H_j = \frac{\sqrt{\sum_{i=1}^{n} \left(\frac{x_i}{X}\right)^2} - \sqrt{1/n}}{1 - \sqrt{1/n}}$$

where xi = value of exports of the product i and n = number of products (of CITC classification. 3 digit) = where xi product-export value i and n = products' number of CITC 3 digit-classification.

of convergence in employment levels seems to be confirmed for the case of the governorates in Tunisia between 2001 and 2009 but the coefficient is relatively low as in the case of Morocco (Catin et al. (2007).

Indeed, the imbalances between the coast and the inland areas are so deep that they could not be significantly reduced over the period although the model can highlight convergence effects bearing in mind that unemployment in Tunisia hides a regional disparity reflecting the role that space plays in increasing the inequality between the jobless categories. To illustrate the difference of nearly 14.7 points between the region with the lowest unemployment rate (Central 13.7% in 2012) and the region with the highest unemployment rate (South West 28.4% in 2012) plainly proves the scale of the regional imbalance.

These disparities are more striking by comparing the unemployment rates according to the residential environment showing that in the rural areas the job-opportunities are more scarce than in the urban areas. Beside the regional disparities and the overall unemployment rate, the inland regions are characterized by a very low youth-employability in general and especially among the university graduates. Indeed, the issue of unemployment affects the young people aged between (20-30ans) and particularly those of the inland regions.

Indeed, the graduates' unemployment rate exceeds 30% in the inland regions with a 42% ceiling in the Governorate of Gafsa followed by Jendouba (36.3%), Kasserine (35.9%) and Siliana (35.1%), while it is only 13.8% in the district of Tunis and nearly 20% in the north east and east centre. These inequalities are accuentuated in the rural areas and reach alarming figures in the governorates of Siliana (50.8%) and Kasserine (49.7%).

CONCLUSION.

The empirical model that we estimated in the framework of the research conducted on dynamic externalities and regional development and initiated by Glaeser et al. (1992) shows that the industrial development in the regions in Tunisia has been fostered by their initial productive specializations (MAR externalities) while the externalities associated with the diversification of the industrial sectors (Jacobs externalities) are not significant for the growth of industrial employment. Indeed, the firms which are mostly small- size and specialized mainly in the low value-added activities in the field of low- cost outsourcing and geared towards exports to Europe have generated employment in the specialized industrial areas which are concentrated on the coastal regions. In some activities, industrial development, notwithstanding its low value, could be promoted through local competition (Porter- type externality) by wage-cuts. However, this industrial specialization implemented in Tunisia

reflects the dualistic model between the offshore system mainly focused on the coastline which is very dynamic in exporting to Europe and driven by foreign capital and the on-shore system which id disconnected from the dynamic of international markets that characterizes the majority of the companies operating in the inland areas. In addition, the positioning of the off shore in the low-cost outsourcing offers no opportunity to integrate into the local economy. However, the integration of the on-shore and off-shore sectors especially in the inland regions is the pre-requisite for the success of any regional development policy.

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APPENDIX 1

UNEMPLOYMENT RATE IN INDUSTRY AND REGIONAL LEVEL

Table 1 : Unemployment rate by region

Regions		2010			2012 (trimester 1)		
		Number of unemployed - 492 842			Number of unemployed - 709 700		
		% Pop. active	% chômeurs	Taux de chômage	% Pop active	% chômeurs	Taux de chômage
Littoral	District of Tunis	24,4	24,6	13,2%	24,7	23,9	17,7%
	North East	16,0	13,5	11,0%	20,4	14,7	13,2%
	East Central	23,5	16,7	9,3%	19,3	14,5	13,7%
West and south	North West	11,5	12,7	14,4%	9,1	10,7	21,4%
	central West	12,0	13,6	14,8%	16,7	18,7	20,5%
	South East	7,6	9,8	16,8%	7,0	10,5	27,4%
	South West	5,0	9,1	23,4%	4,5	7,0	28,4%
Total		100	100	13,0%	100	100	18,9%

Source ; Author'sProcessing from INS Data

Table 2 : Unemployment rate by region and level of education

Regions		Illetrate	Primary	Secondary	High education	Total
Littoral	District de Tunis	7.4	13.8	15.1	13.8	14.1
	North East	3.8	6.4	9.6	20.6	8.9
	East Central	6.7	12.2	12	19.9	13
West and south	North West	6.7	17.8	24.5	32.6	18.8
	central West	6.1	11.9	19.1	33.6	14.9
	South East	4.6	10.8	17.1	29	15.5
	South West	5.5	18.4	24.7	38.9	23.4
TOTAL		6	12.3	15.3	21.6	14.2

Source ; Processing from INS Data (2010)

APPENDIX 2

LIST OF REGIONS AND INDUSTRIAL SECTORS

Table 1 – Regions in Tunisia

Regions	Governorates
District of Tunis	Ariana, Ben Arous, Manouba, Tunis
North East	Bizerte, Nabeul, Zaghouan
North West	Béja, Jendouba, Le kef, Siliana
East Central	Mahdia, Monastir, Sfax, Sousse
central West	Kairouan, Kasserine, Sidi-Bouzid
South	Gabes, Gafsa, Kebili, Medenine, Tataouine, Tozeur

Table 2 – List of industrial sectors

Sector code	Activity
IAA	Agricultural and food industry
IMCCV	Building Materials Ceramics and Glass Industry.
IME	Mechanical and electrical industry
ICH	Chemical industry
ITHCC	Textile, clothing, leather and footwear industry
ME	Mines and energy
PTB	Bulding and public works
ID	Other Industries